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Statistics on Water in Mexico

2008 edition

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Statistics on Water in Mexico
2008 edition

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Introduction

In Mexico, the management and preservation of water resources is a complex task that requires the collaborative work of several federal, state and municipal dependencies, as well as society at large. To achieve this task, these stakeholders must have at their disposal information that is reliable, up-to-date and appropriate on all aspects related with water management, from variables related to the components of the hydrologic cycle to the socio-economic aspects that affect the use of water.

In this context, the National Water Commission of Mexico has been promoting the dissemination of statistical information on water since 1999, through the Basic Compendium of Water in Mexico and up to today with the 2008 edition of "Statistics on Water in Mexico", in which we aim to present the reader with a clear and up-do-date overview of the situation as regards water in Mexico, comparing this situation to other countries in the world. This document has been produced as part of the National Information System on Water Quantity, Quality, Uses and Conservation (SINA in Spanish), which is made up of information provided by the various institutions and organizations that take part in the management and preservation of water.

One of the aims of the 2007-2012 National Water Program is to improve the technical, administrative and financial development of the water sector. One of the strategies to achieve this is through the strategic information system and indicators of the water sector, for which the goal has been stated of designing and implementing the SINA 100% by 2012. It is in this framework that the present document has been produced.

The document includes eight chapters, in which we present information on the geographical and socio-economic context of the country and the way in which water occurs and is used. Similarly, information is included on the index and degree of poverty, precipitation, runoff, aquifer recharge, meteorological phenomena and water quality. In the theme of water infrastructure we include storage dams, aqueducts, water purification plants and wastewater treatment plants, amongst others. In the same way, the tools that exist in Mexico to carry out a better management of water resources are mentioned. Additionally, information is provided on the relationship between water and the themes of health and the environment, while offering an overview up to 2030 and the aspects related with water planning. Finally, several indicators are compared which allow us to place the information on Mexico into context with other countries.

In addition to the printed version of this document, an interactive compact disk has been prepared, which includes more detailed information for those interested in going deeper into the themes and data presented, as well as the digital information files.

We are sure that the publication we are presenting will be of interest and use, and will without doubt contribute to enhancing the appreciation of the situation as regards water in Mexico, supporting the raising of awareness on the responsible use and fair payment for water, a vital resources for life and our nation's economic development, as well as for the preservation of the environment.

Director General's Office of the National Water Commission of Mexico
Mexico City, September 2008.

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Chapter 1

Geographical and Socio-Economic Context

Given that catchments or river basins are the basic units of water resources management, the country has been divided into 13 Hydrological-Administrative Regions with the aim of organizing the management and preservation of the nation's water.

In this first chapter, it may be appreciated that Mexico has a substantial territorial extension and a great length of coasts; furthermore, it has gone through an accelerated population growth in recent years, which has seen the population go from being predominantly rural to mainly urban. Economic and social inequalities are presented, as well as inequalities in availability of water resources. Additionally, new concepts such as the index and degree of poverty are presented.

1.1 Geographical and demographic aspects

Mexico covers a total area of 1 964 375 km², of which 1 959 248 km² is the mainland area and 5 127 km² are islands. Additionally, the Exclusive Economic Zone of territorial sea, covering 3 149 920 km² should be added to this area. As a result, the country's overall surface area is 5 114 295 km².

Mexico is between the longitudes of 118°42' and 86°42' west and the latitudes of 14°32' and 32°43' north, the same latitudes as the Sahara and Arabian deserts. Due to Mexico's relief characteristics, there exists a great variety of climates. Two thirds of the territory of Mexico is considered arid or semi-arid, whereas the southeast is humid, with annual precipitations which exceed 2 000 mm per year in some zones. Of the country's population, 63% lives in areas at least 1 000 meters above sea level.

Mexico is made up of 31 states and a Federal District (known as the D.F. in Spanish), which can be further broken down into 2 449 municipalities and 16 delegations of the D.F. respectively.

Between 1950 and 2005, the country's population quadrupled, and went from being predominantly rural (57.4%) to mainly urban (76.5%). During the same time period, the mean annual birth rate decreased significantly. The highest rate was during the period from 1960 to 1970 (3.40%), but it then fell to 1.02% in the period from 2000 to 2005. In the table of G1.1, the growth rates of the rural, urban and total population are shown for the period from 1950 to 2005.

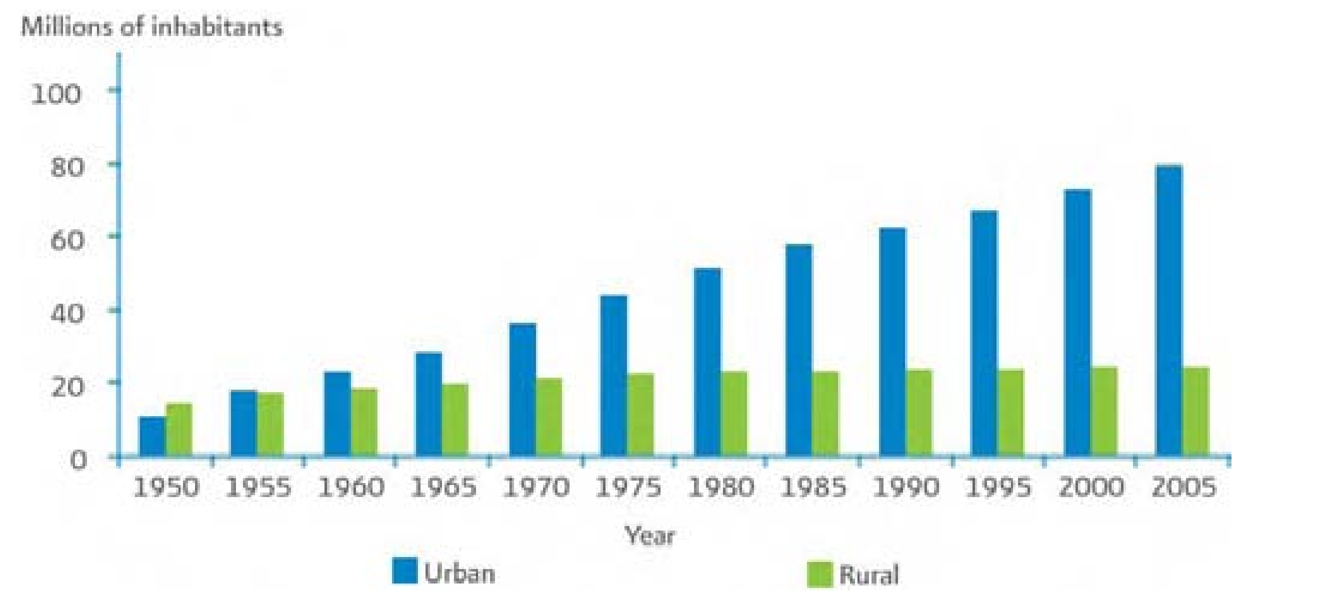
T1.1 Mexico's position and surface area

Surface area		Borders
Total area:	1 964 375 km²	3 152 km with the United States of America
Mainland area:	1 959 248 km²	956 km with Guatemala
Island area:	5 127 km²	193 km with Belize
Exclusive Economic Zone of territorial sea:	3 149 920 km²	
Total surface area:	5 114 295 km²	

Length of the coastline:	Extreme geographical coordinates:
11 122 km	North: 32° 43' 06'' latitude north, marked at Monument 206, on the border with the United States of America.
7 828 km in the Pacific Ocean	South: 14° 32' 27'' latitude north. At the mouth of the Suchiate River, at the border with Guatemala.
3 294 km in the Gulf of Mexico and the Caribbean Sea	East: 86° 42' 36'' longitude west. Extreme southwest of Mujeres Island in the Mexican Caribbean.
	West: 118° 27' 24'' longitude west. Tip of Elephant Rock on Guadalupe Island in the Pacific Ocean.

SOURCE: INEGI. Yearbook of Statistics by State, 2007 Edition. Mexico, 2007.

G1.1 Population of Mexico, from 1950 to 2005



Evolution of the population in Mexico, from 1950 to 2005
(Millions of inhabitants)

Year	1950	1955	1960	1965	1970	1975	1980	1985	1990	1995	2000	2005
Rural	14.80	17.23	18.58	19.93	21.24	22.55	22.93	23.30	23.73	24.16	24.71	24.28
Urban	11.02	17.76	23.10	28.43	36.45	44.47	51.34	58.21	62.73	67.25	72.98	79.20
Total	25.82	34.99	41.68	48.36	57.69	67.02	74.27	81.51	86.46	91.41	97.69	103.48

NOTE: The population was interpolated on December 31st of each year, based on data from the Censuses. [Translator's Note: In Mexico there are two types of Census, referred to as "Censo" and "Conteo". Both are carried out every ten years, the "Censo" in years ending with 0 and the "Conteo" in years ending in 5. For the purpose of this publication, they will only be referred to by the English term "Census".]
The rural population is considered as that which lives in localities of less than 2 500 inhabitants, whereas the urban population refers to populations of 2 500 inhabitants or more.
SOURCE: CONAGUA. Deputy Director General's Office for Planning. Produced based on data from INEGI. General Censuses.

Approximately 10% of the rural population may be found spread out in small localities of less than 100 inhabitants, to whom it is particularly expensive to provide drinking water and sanitation services.

According to the latest Census from 2005, there are 187 938 inhabited localities in Mexico, spread out as follows, according to their population:

T1.2 Distribution of the population, by the size of the locality, 2005

Population of the locality	Number of localities	Population (Millions of inhabitants)	Percentage of the overall population
More than 500 000	34	29.12	28.20
Between 50 000 and 499 999	162	26.45	25.61
Between 2 500 and 49 999	2 994	23.41	22.67
Between 100 and 2 499	47 233	21.84	21.15
Less than 100	137 515	2.44	2.36
Total	**187 938**	**103.26**	**100.00**

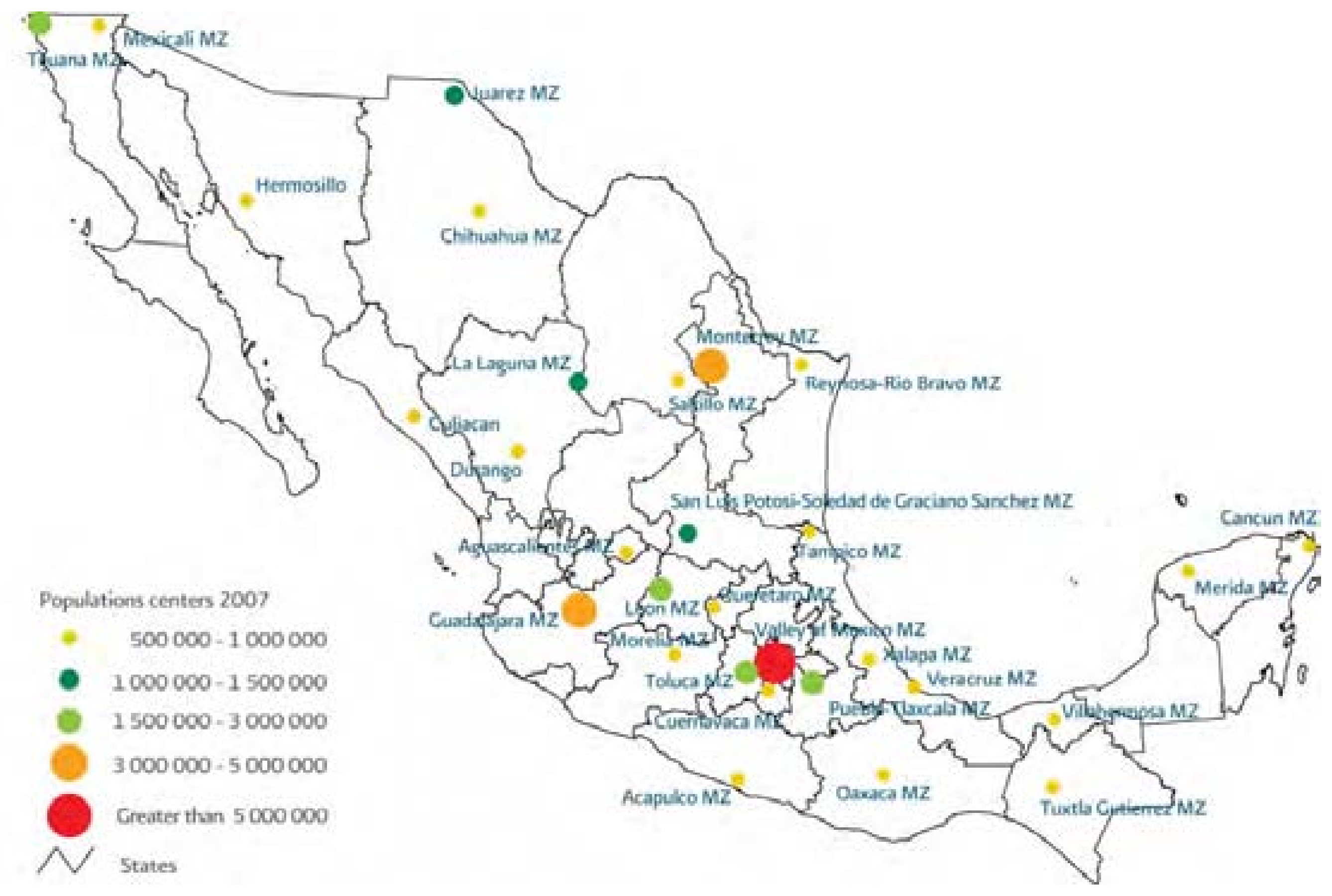
SOURCE: INEGI. II Census of Population and Housing 2005.
NOTE: The data in the table is as of the date of the Census, and for that reason it differs from the data in graphic G1.1, which was interpolated.

1.2 Population centers

In Mexico there are 56 metropolitan zones[a] in which, in 2005, 57.9 million inhabitants, or 56.0% of the total population, were concentrated. The area covered by the metropolitan zones is 167 028 km², spread out over 345 municipalities[b].

There are 30 population centers in the country with more than 500 000 inhabitants, of which 27 refer to one of the metropolitan zones (MZ) and the others are individual municipalities. In the following figure these population centers are shown:

M1.1 Population centers of more than 500 000 inhabitants, projection for 2007



NOTE: Includes metropolitan zones and single municipalities.
SOURCE: CONAGUA. Deputy Director General's Office for Planning. Produced based on:
SEDESOL, INEGI and CONAPO. Limits of the Metropolitan Zones in Mexico 2005. Mexico, 2007.
INEGI. II Census of Population and Housing 2005.

[a] A metropolitan zone is defined as the sum of two or more municipalities which includes a city of 50 000 or more inhabitants, the urban area, functions and activities of which go beyond the municipal limit in which they were originally confined, incorporating mainly urban neighboring municipalities either completely or in their direct area of influence, 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.

[b] Includes the 16 delegations of the D.F.

The metropolitan zones of the Valley of Mexico, Guadalajara, Monterrey, Puebla-Tlaxcala and Toluca, concentrate 30.8% of the country's population, or 31.81 million inhabitants, as shown in the following table:

T1.3 Mexico's five metropolitan zones with the largest population, 2007

No.	Metropolitan Zone	States	Population in 2007 (millions of inhabitants)	Number of municipalities and/or delegations of the D.F.	Surface area
1	Valley of Mexico	DF-Hidalgo-State of Mexico	19.35	76	7 854
2	Guadalajara	Jalisco	4.26	8	2 734
3	Monterrey	Nuevo Leon	3.90	12	6 704
4	Puebla-Tlaxcala	Puebla-Tlaxcala	2.58	38	2 217
5	Toluca	State of Mexico	1.72	14	2 038
Total			**31.81**	**148**	**21 557**

SOURCE: CONAGUA. Deputy Director General's Office for Planning. Produced based on:
INEGI. II Census of Population and Housing 2005.
SEDESOL, INEGI and CONAPO. Limits of the Metropolitan Zones of Mexico 2005. Mexico, 2007
CONAPO. Population Projections in Mexico 2005-2050. Mexico 2007, interpolated in December every year.

1.3 Economic Indicators

Mexico's GDP per capita in 2007 was close to 8 500 dollars and inflation has been maintained in recent years to levels of around 4%, much lower than the rate in the previous decade.

T1.4 Mexico's Main Economic Indicators, from 1990 to 2007

Indicators	Year					
	1990	1995	2000	2005	2006	2007
Gross Domestic Product (GDP) in billions of dollars	262.7	286.2	580.8	767.7	840.0	893.4
GDP per capita in dollars	3 157	3 140	5 928	7 447	8 060	8 479
Inflation based on the National Consumer Price Index (December each year)	29.93%	51.97%	8.96%	3.33%	4.05%	3.76%

SOURCE: International Monetary Fund, World Economic Outlook. United States of America, 2008.
Bank of Mexico's Annual Report 2007, April 2008 www.banxico.org.mx. Mexico, 2008.

As part of the United Nations' recommendations as regards national accounting, in Mexico the damage caused to the environment and natural resources in general is quantified in physical and monetary terms, as a result of economic processes.

In this sense, research headed by INEGI with the support of different sectors and public institutions, including the Conagua, has allowed the cost of exhausting natural resources and the degradation of the environment through human economic activities to be determined.

It is estimated that these costs have monetary values of between 8% and 9% of the GDP. With these costs, it is possible to estimate the Environmentally-adjusted net Domestic Product (EDP) and the Ecological Gross Domestic Product (EGDP).

1.4 Index and degree of poverty[a]

The definition, identification and measurement of poverty in Mexico is one of the responsibilities of the National Council for the Evaluation of the Social Development Policy (CONEVAL, its initials in Spanish), a body created in 2006 under the General Law for Social Development. The CONEVAL developed the Poverty Index taking into account the multi-dimensional character of poverty. The index includes aspects of education, access to health and other basic services, quality housing and spaces, and household assets. The data used was obtained from the definitive results of the II Census of Population and Housing 2005. It should be mentioned that the Poverty Index is an indicator of deficiencies that is estimated at three geographical levels: state, municipality and local. With this index, the aim is to contribute to the generation of information as a decision-making tool on social policies at various levels of operation, thus facilitating the identification of areas for priority attention.

According to the value of the Poverty Index, the degree of poverty is determined, which may be very low, low, medium, high or very high. The following table presents the index and degree of poverty of the country's poorest municipalities.

T1.5 Municipalities with the highest index and degree of poverty, 2005

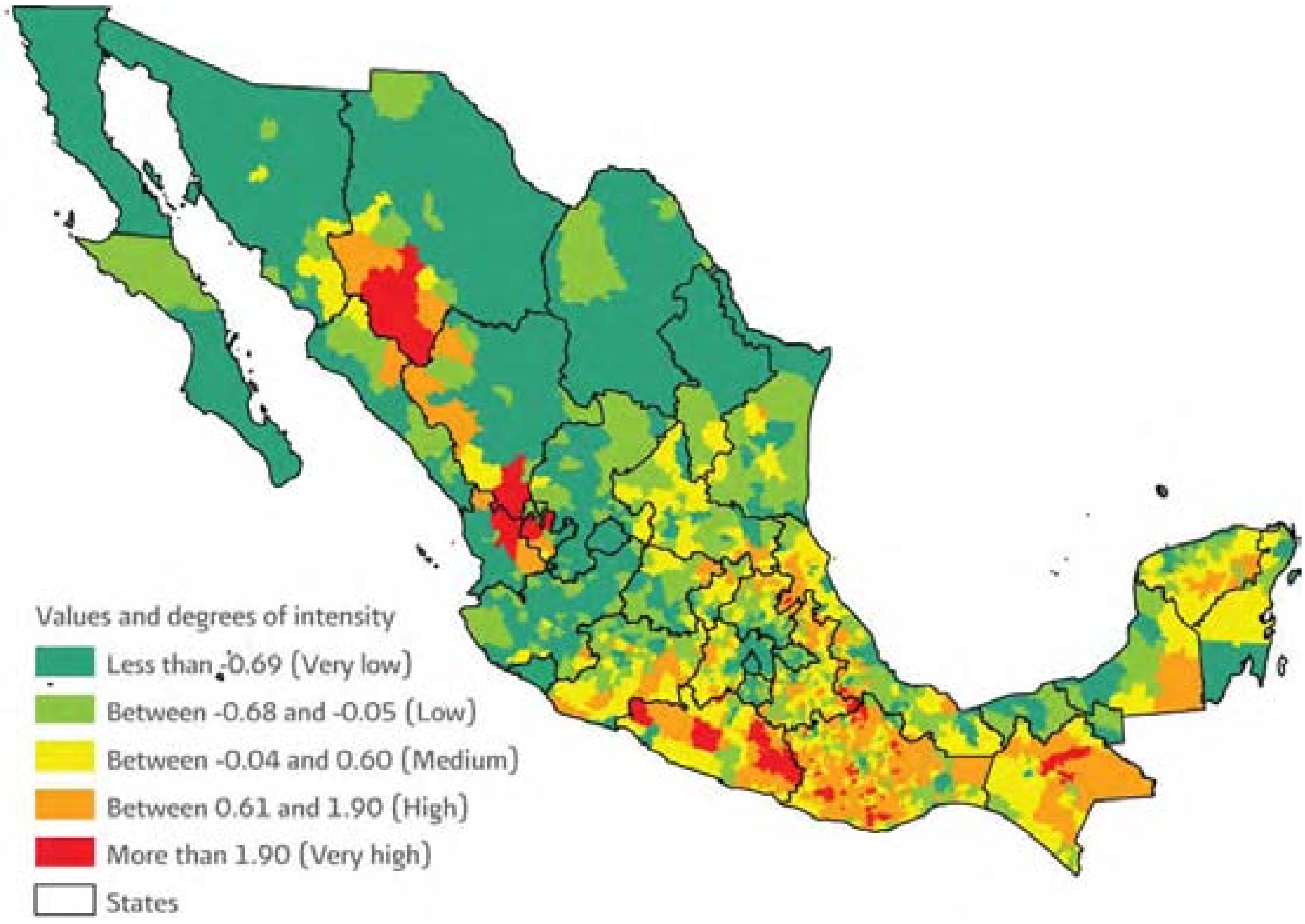
No.	Municipality	State	Total population	Poverty Index	Degree of Poverty
1	Cochoapa el Grande	Guerrero	15 572	4.49541	Very high
2	Batopilas	Chihuahua	13 298	3.40930	Very high
3	Coicoyan de las Flores	Oaxaca	7 598	3.26255	Very high
4	Sitala	Chiapas	10 246	3.22790	Very high
5	Del Nayar	Nayarit	30 551	3.11527	Very high
6	Acatepec	Guerrero	28 525	3.11212	Very high
7	Metlatonoc	Guerrero	17 398	3.07010	Very high
8	San Juan Petlapa	Oaxaca	2 717	2.97982	Very high
9	Jose Joaquin de Herrera	Guerrero	14 424	2.92035	Very high
10	Chalchihuitan	Chiapas	13 295	2.90154	Very high
11	Tehuipango	Veracruz de Ignacio de la LLave	20 406	2.86560	Very high
12	Mixtla de Altamirano	Veracruz de Ignacio de la Llave	9 572	2.82344	Very high
13	Santiago Amoltepec	Oaxaca	11 113	2.79609	Very high
14	San Jose Tenango	Oaxaca	18 120	2.73941	Very high
15	Santa Lucia Miahuatlan	Oaxaca	3 023	2.70057	Very high
16	Copanatoyac	Guerrero	17 337	2.69112	Very high
17	San Martin Peras	Oaxaca	12 406	2.61753	Very high
18	Santa Cruz Zenzontepec	Oaxaca	16 773	2.61703	Very high
19	Santiago el Pinar	Chiapas	2 854	2.60073	Very high
20	Mitontic	Chiapas	9 042	2.59529	Very high
Total			**274 270**		

SOURCE: CONEVAL. Poverty Maps in Mexico. 2007.

[a] Translator's Note: The Index is known in Spanish as the "Indice de Rezago Social" and the degree is referred to as the "Grado de Rezago Social".

The states of Chiapas, Guerrero and Oaxaca have a very high degree of poverty, in accordance with their level of low incomes. The main reason for this backlog may be found in the fact that these states have a high level of educational poverty, very low coverage of basic services and very low access to social security. These deficiencies, together with their low incomes, underpin the high poverty rates in these states. In the following map the index and degree of social poverty are shown by municipality.

M1.2 Municipal Poverty Index 2005



SOURCE: CONEVAL. Poverty Maps in Mexico. 2007. "Indice de Rezago Social".

In the 106 municipalities with a very high degree of poverty, the occurrence of food deficiency is above 40 percent: 1.4 million inhabitants live in these municipalities.

1.5 The Hydrological-Administrative Regions for water management

Given that the catchment is the basic unit for the management of water resources, the country has been divided into 13 Hydrological-Administrative Regions, with the aim of organizing the management and preservation of the nation's waters. The Hydrological-Administrative Regions are made up by grouping together catchments, respecting the municipal limits 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 13 River Basin Organizations (formerly known as Regional Departments), the scope of competence of which are the Hydrological-Administrative Regions, shown in the following figure:

M1.3 Hydrological-Administrative Regions

SOURCE: CONAGUA. Deputy Director General's Office for Planning. Produced based on the By-Laws of the CONAGUA and the CONAGUA's River Basin Organizations' Territorial Constituency Agreement, published in the Official Government Gazette on December 12th, 2007.

The cities in which the River Basin Organizations have their headquarters are shown in the following table:

T1.6 Host cities of the River Basin Organizations

	River Basin Organization	Host city
I	Baja California Peninsula	Mexicali, Baja California
II	Northwest	Hermosillo, Sonora
III	Northern Pacific	Culiacan, Sinaloa
IV	Balsas	Cuernavaca, Morelos
V	Southern Pacific	Oaxaca, Oaxaca
VI	Rio Bravo	Monterrey, Nuevo Leon
VII	Central Basins of the North	Torreon, Coahuila de Zaragoza
VIII	Lerma-Santiago-Pacific	Guadalajara, Jalisco
IX	Northern Gulf	Ciudad Victoria, Tamaulipas
X	Central Gulf	Xalapa, Veracruz
XI	Southern Border	Tuxtla Gutierrez, Chiapas
XII	Yucatan Peninsula	Merida, Yucatan
XIII	Waters of the Valley of Mexico	Mexico City, Federal District

SOURCE: By-Laws of the CONAGUA. Mexico, 2006.

The Hydrological-Administrative Regions were defined according to the limits of the country's catchments, and are made up of whole municipalities. The municipalities that make up each one of these Hydrological-Administrative Regions are indicated in River Basin Organizations' Territorial Constituency Agreement, published in the Official Government Gazette on December 12th, 2007.

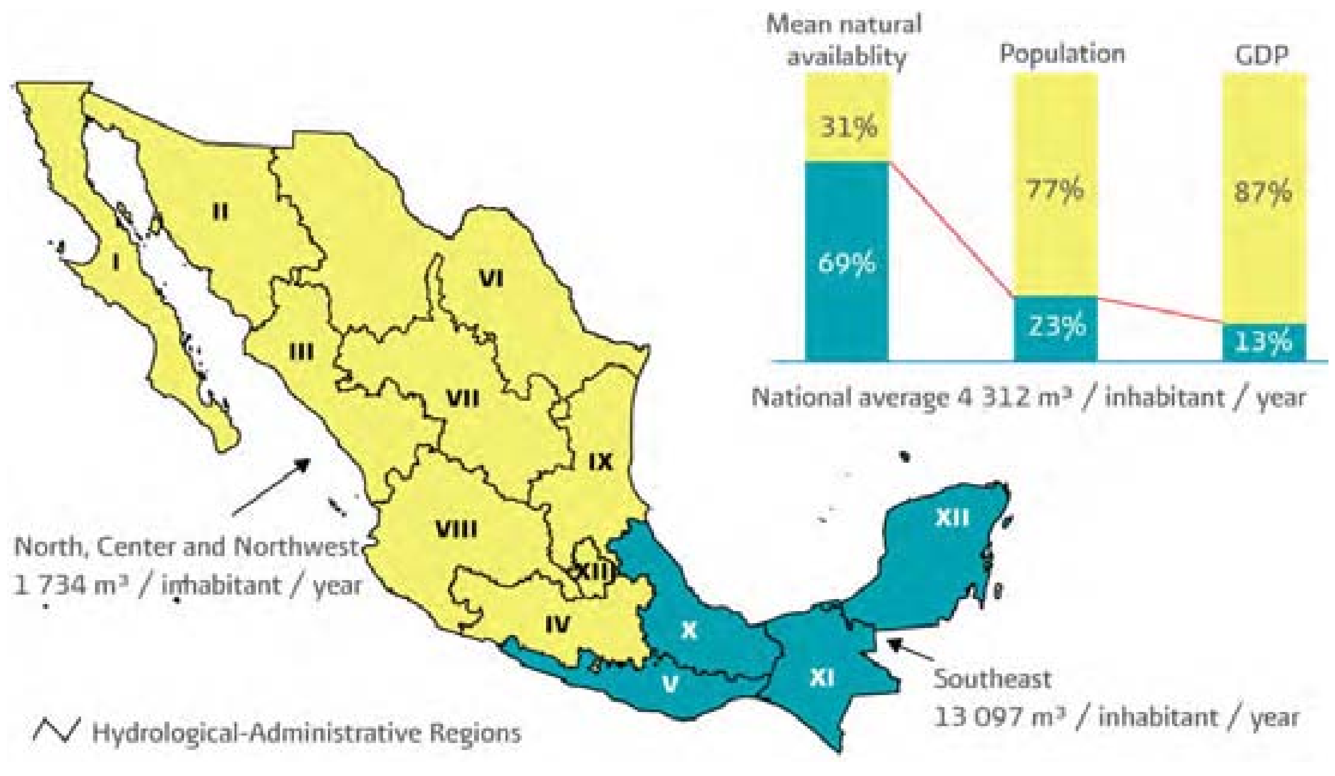
In addition, the CONAGUA has 20 Local Offices (formerly known as State Departments "Gerencias Estatales") in the states in which no River Basin Organization has its headquarters.[a]

1.6 Regional contrast between development and the availability of water

The country may be divided into two main zones: the north, center and northwest zone, which concentrates 77% of the population, where 87% of the Gross Domestic Product is generated, but only 31% of the renewable water may be found; and the south and southeast zone, where 23% of the population lives, 13% of the GDP is generated and 69% of the renewable water occurs. The figure M1.4 illustrates the disparity between these two zones as regards their availability of water and economic activity.

[a] There are 31 States and one Federal District (D.F.) in Mexico. For the purpose of this publication, all 32 will be referred to as "States".

M1.4 Regional contrast between development and the availability of water, 2007



SOURCE: CONAGUA. Deputy Director General's Office for Planning. Produced based on:
CONAGUA. Deputy Director General's Office for Technical Affairs.
INEGI. 2004 Economic Censuses. Mexico, 2005.

1.7 Summary of data by Hydrological-Administrative Region and State

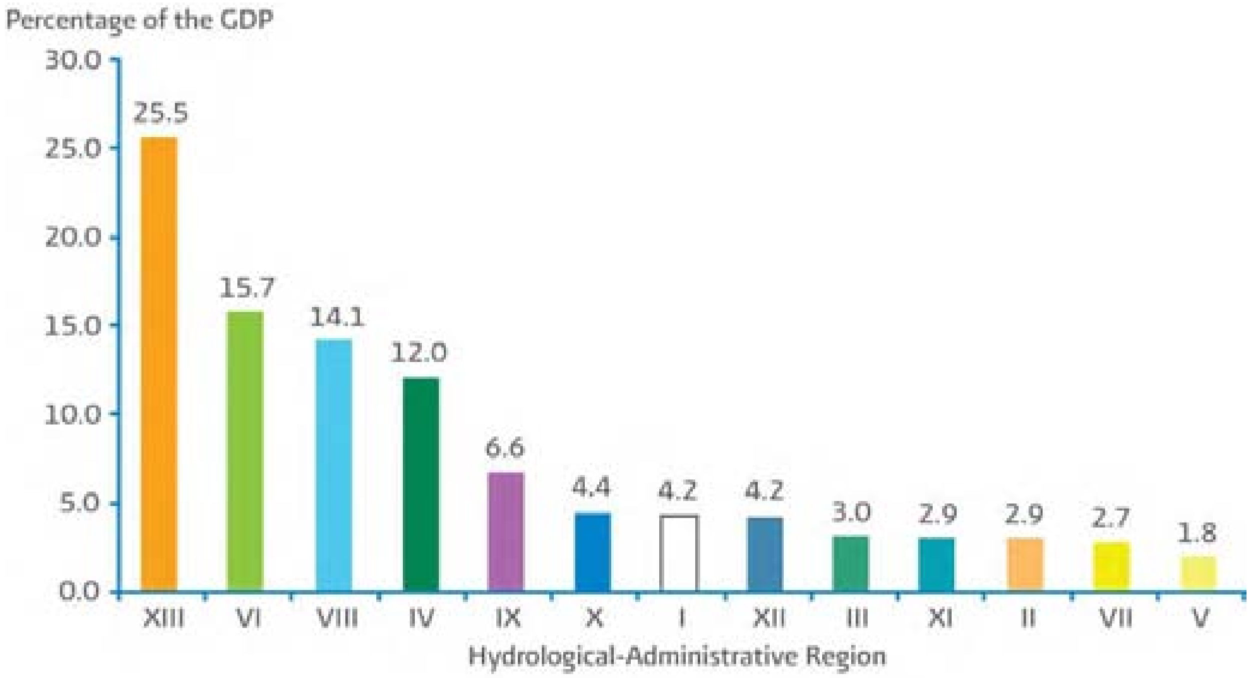
The following table shows the main geographical and socio-economic data for each Hydrological-Administrative Region. It should be mentioned that the majority of the country's economic activity is concentrated in the Hydrological-Administrative Regions XIII Waters of the Valley of Mexico, VI Rio Bravo, VIII Lerma-Santiago-Pacific and IV Balsas, which between them generate two thirds of the national Gross Domestic Product (GDP).

T1.7 Geographical and socio-economic data, by Hydrological-Administrative Region

Hydrological-Administrative Region		Population in 2007[a] (inhabitants)	Mainland area[b] (km^2)	Population density in 2007 (inhabitants/km^2)	GDP 2006 (%)	Municipalities and/or Delegations of the D.F.[c] (number)
I	Baja California Peninsula	3 580 948	145 386	25	4.22	10
II	Northwest	2 572 252	205 218	13	2.86	79
III	Northern Pacific	3 959 279	152 013	26	3.00	51
IV	Balsas	10 535 977	119 247	88	12.00	422
V	Southern Pacific	4 116 080	77 525	53	1.81	362
VI	Rio Bravo	10 703 815	379 552	28	15.66	141
VII	Central Basins of the North	4 120 949	202 562	20	2.66	83
VIII	Lerma-Santiago-Pacific	20 625 203	190 366	108	14.14	329
IX	Northern Gulf	4 941 244	127 166	39	6.60	154
X	Central Gulf	9 583 822	104 790	91	4.43	445
XI	Southern Border	6 502 913	101 231	64	2.89	139
XII	Yucatan Peninsula	3 903 937	137 753	28	4.22	124
XIII	Waters of the Valley of Mexico	21 090 206	16 438	1 283	25.50	116
Total		**106 236 625**	**1 959 248**	**54**	**100**	**2 455**

NOTE: [a] Calculated based on the CONAPO's 2005-2030 projections. Population as of December.
[b] INEGI, Municipal Geostatistical Framework, Version 3.1.1. 2008.
[c] Calculated based on the Gross Censual Added Value by Municipality for 2006.
SOURCE: CONAGUA. Deputy Director General's Office for Planning. Produced based on data from INEGI. General Censuses.

G1.2 Percentage of the national Gross Domestic Product, by Hydrological-Administrative Region, 2006



SOURCE: CONAGUA. Deputy Director General's Office for Planning. Produced based on:
INEGI. II Census of Population and Housing 2005.
INEGI. 2004 Economic Censuses. Mexico, 2007.

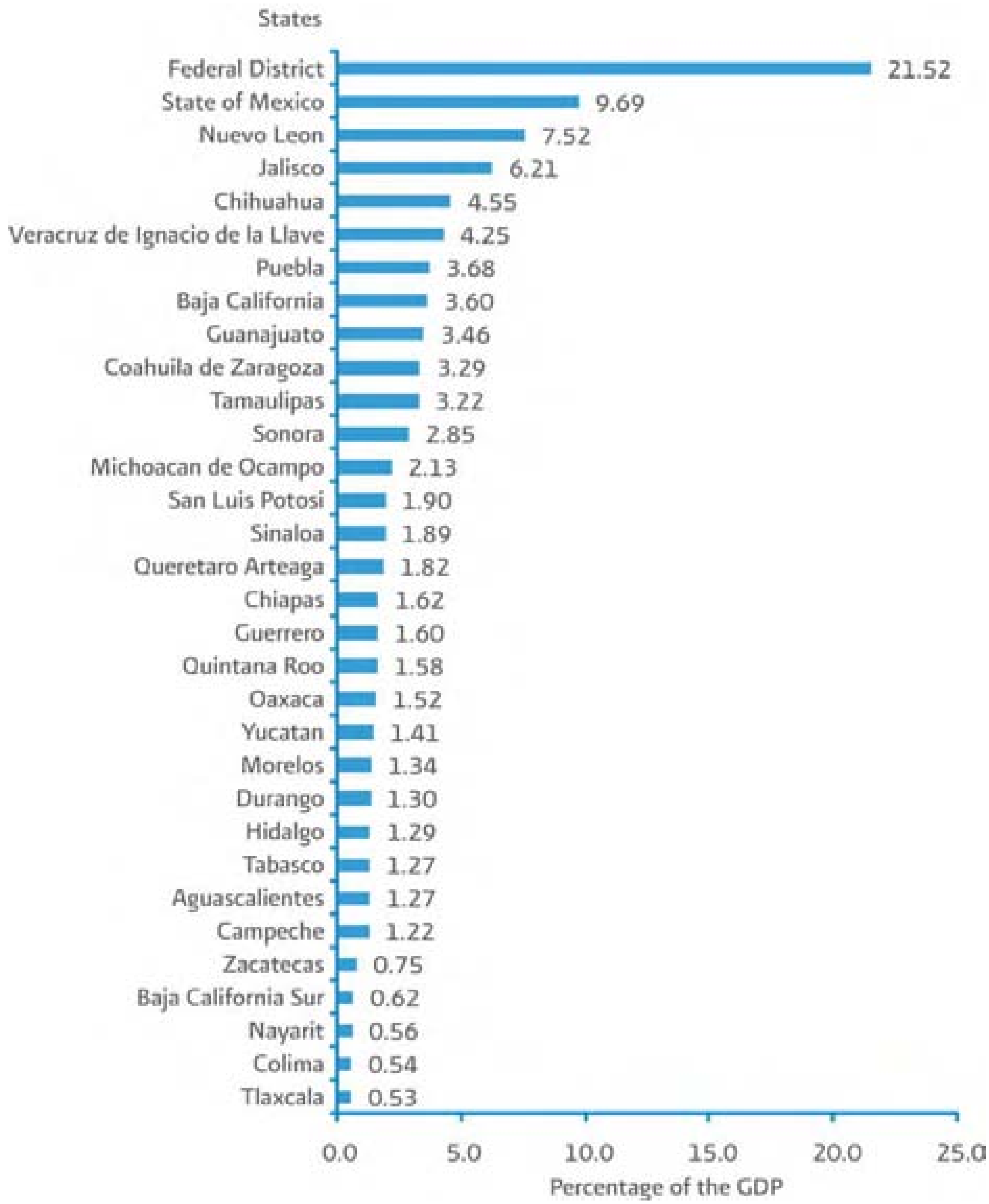
The following table presents geographical and socio-economic data on the states of Mexico, as well as a graph showing the contribution of each of them to the nation's Gross Domestic Product. It is worth mentioning that the Federal District concentrates more than a fifth of the national GDP.

T1.8 Geographical and socio-economic data by state

	State	Population in 2007[a] (inhabitants)	Mainland area[b] (km^2)	Population density in 2007 (inhabitants/km^2)	GDP 2006[c] (%)	Municipalities and/or Delegations of the D.F.[b] (number)
1	Aguascalientes	1 115 304	5 618	199	1.27	11
2	Baja California	3 036 393	71 463	42	3.60	5
3	Baja California Sur	544 556	73 922	7	0.62	5
4	Campeche	782 130	51 352	15	1.22	11
5	Coahuila de Zaragoza	2 587 917	151 623	17	3.29	38
6	Colima	589 327	5 625	105	0.54	10
7	Chiapas	4 435 911	73 178	61	1.62	118
8	Chihuahua	3 343 408	247 478	14	4.55	67
9	Durango	1 541 433	123 287	13	1.30	39
10	Federal District	8 832 734	1 496	5 905	21.52	16
11	Guanajuato	5 008 063	30 609	164	3.46	46
12	Guerrero	3 147 680	63 652	49	1.60	81
13	Hidalgo	2 402 682	20 824	115	1.29	84
14	Jalisco	6 931 957	78 598	88	6.21	125
15	State of Mexico	14 536 860	22 357	650	9.69	125
16	Michoacan de Ocampo	3 984 577	58 614	68	2.13	113
17	Morelos	1 655 138	4 882	339	1.34	33
18	Nayarit	965 641	27 815	35	0.56	20
19	Nuevo Leon	4 365 090	64 225	68	7.52	51
20	Oaxaca	3 552 685	93 524	38	1.52	570
21	Puebla	5 567 191	34 283	162	3.68	217
22	Queretaro Arteaga	1 674 737	11 707	143	1.82	18
23	Quintana Roo	1 243 989	38 784	32	1.58	8
24	San Luis Potosi	2 467 651	61 112	40	1.90	58
25	Sinaloa	2 645 933	57 377	46	1.89	18
26	Sonora	2 475 658	179 484	14	2.85	72
27	Tabasco	2 034 507	24 743	82	1.27	17
28	Tamaulipas	3 135 501	80 243	39	3.22	43
29	Tlaxcala	1 112 200	4 006	278	0.53	60
30	Veracruz de Ignacio de la Llave	7 251 626	71 846	101	4.25	212
31	Yucatan	1 886 161	37 409	50	1.41	106
32	Zacatecas	1 381 991	75 313	18	0.75	58
Total		**106 236 625**	**1 946 449**	**54**	**100**	**2 455**

NOTE: [a] Calculated based on the CONAPO's 2005-2030 projections. Population as of December.
[b] The total does not add up the total surface area of 1 959 248 km^2 since there are still seven areas of the country that have not yet been assigned in version 3.1.1 of the Municipal Geostatistical Framework, 2008, for a total area of 12 798 km^2.
[c] Calculated based on the Gross Censual Added Value by Municipality for 2006.
SOURCE: CONAGUA. Deputy Director General's Office for Planning. Produced based on data from INEGI. General Censuses.

G1.3 Percentage of the national Gross Domestic Product, by State, 2006



SOURCE: INEGI. 2004 Economic Censuses. Mexico, 2007.

Chapter 2

The state of water resources

This chapter presents the various elements of the hydrologic cycle, from precipitation to runoff into rivers and streams, and aquifer recharge, as well as the evolution in availability of water in Mexico. The list of the country's main rivers is also elaborated on.

On the subject of meteorological phenomena, the intense hurricanes that have hit Mexico since 1970 are presented, as is the opposite phenomena, droughts, which are discussed in greater depth in this edition.

As regards the information related to the quality of surface and groundwater, the evolution in recent years is also included.

2.1 Mexico's Catchments and Aquifers

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 catchments, or filters through to the country's aquifers.

As a result of work carried out by the CONAGUA, INEGI and INE, 1471 catchments or river basins ("cuencas hidrograficas") have been identified in Mexico. For the purpose of this work, the terms "catchment" and "river basin" are used indiscriminately to translate the Spanish term "cuenca hidrografica". For the purpose of the publication of surface water, they have been grouped and/or divided into 728 watersheds ("cuencas hidrologicas").

The country's catchments have been organized into 37 hydrological regions, which are in turn covered by the 13 Hydrological-Administrative Regions mentioned in the previous chapter.

M2.1 Hydrological Regions

SOURCE: CONAGUA. Deputy Director General's Office for Technical Affairs.

Hydrological Regions:

1. Baja California Northwest
2. Baja California Central-West
3. Baja California Southwest
4. Baja California Northeast
5. Baja California Central-East
6. Baja California Southeast
7. Colorado River
8. Sonora North
9. Sonora South
10. Sinaloa
11. Presidio-San Pedro
12. Lerma-Santiago
13. Huicicila River
14. Ameca River
15. Jalisco Coast
16. Armeria-Coahuayana
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

As regards groundwater, the country is divided into 653 aquifers or hydrogeological units, as published in the Official Government Gazette on December 5th, 2001, and as shown in the following map:

M2.2 Limits of the aquifers by Hydrological-Administrative Region

SOURCE: CONAGUA. Deputy Director General's Office for Technical Affairs.

The CONAGUA has 4 058 stations in operation to measure climate and hydrometric variables. The climate stations measure the temperature, precipitation, evaporation, wind speed and direction. The stream gages measure the levels and flows of water in rivers and the volumes of water stored in dams, as well as the withdrawal for the purpose of sampling. The hydroclimate stations take climatic and hydrometric measurements.

T2.1 Number of climate and stream gages in Mexico, 2007

Type of station	Number of stations
Climate Stations[1]	3 348
Stream gages	499
Stations	211
Total	**4 058**

[1] DOf a total of 5 880 climate stations, 3 348 are in operation.
Of the latter, 1 062 are considered reference stations.
SOURCE: CONAGUA. Deputy Director General's Office for Technical Affairs.

Includes 1 062 reference climate stations (see the glossary). Additionally, the CONAGUA, through the National Meteorological Service, operates 79 observatories and 146 automatic meteorological stations.

2.2 Mean Natural Availability of Water

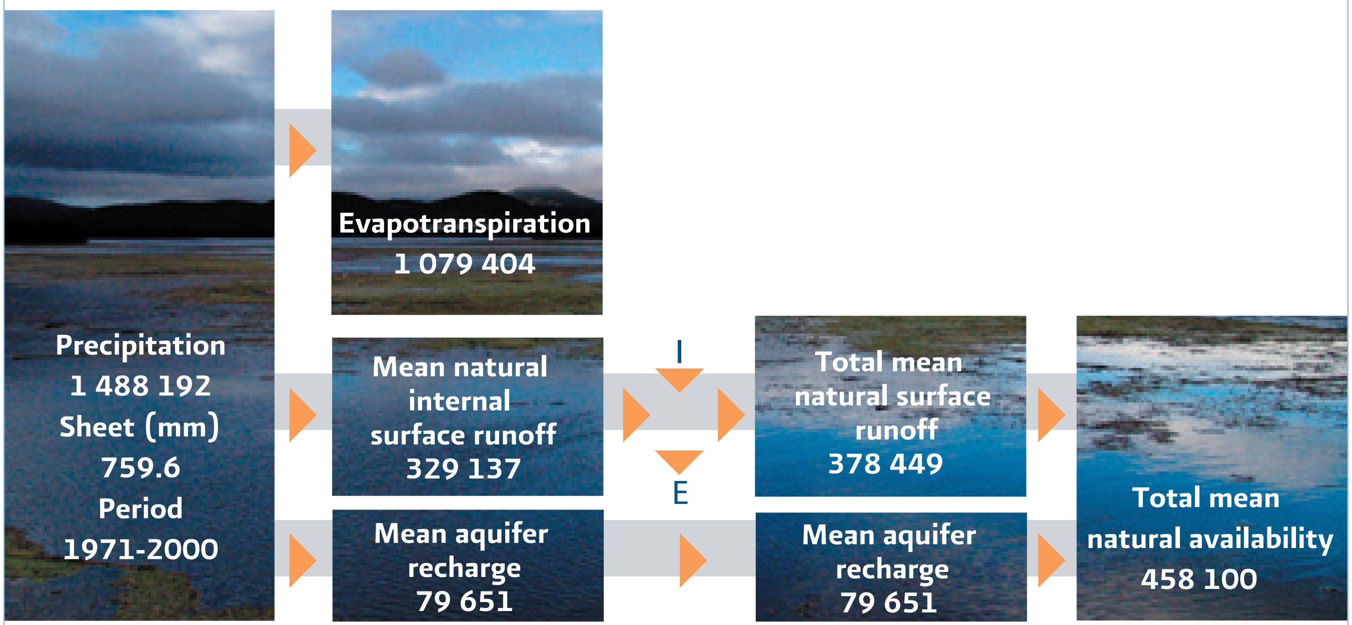
Every year, Mexico receives around 1 488 billon cubic meters of water in the form of precipitation. Of this water, 72.5% evaporates and returns to the atmosphere, 22.1% runs off into rivers and streams and the remaining 5.4% filters through to the subsoil and recharges the aquifers, in such a way that every year the country has 458 billion cubic meters of renewable freshwater, which is referred to as its mean natural availability. The diagram below shows the components and values of this availability.

The imports from other countries refer to the volume of water generated in the shared catchments with the three countries with which Mexico has borders (United States of America, Guatemala and Belize) and which runs off to Mexico. The exports refer to the volume of water that Mexico delivers to the United States of America as part of the 1944 Water Treaty.

In addition to the freshwater that is renewed by rainfall, Mexico has reserves of water stored mainly in its aquifers, but also in the country's natural and artificial lakes; however, this water is not considered in the calculation of mean natural availability, since it is not renewable.

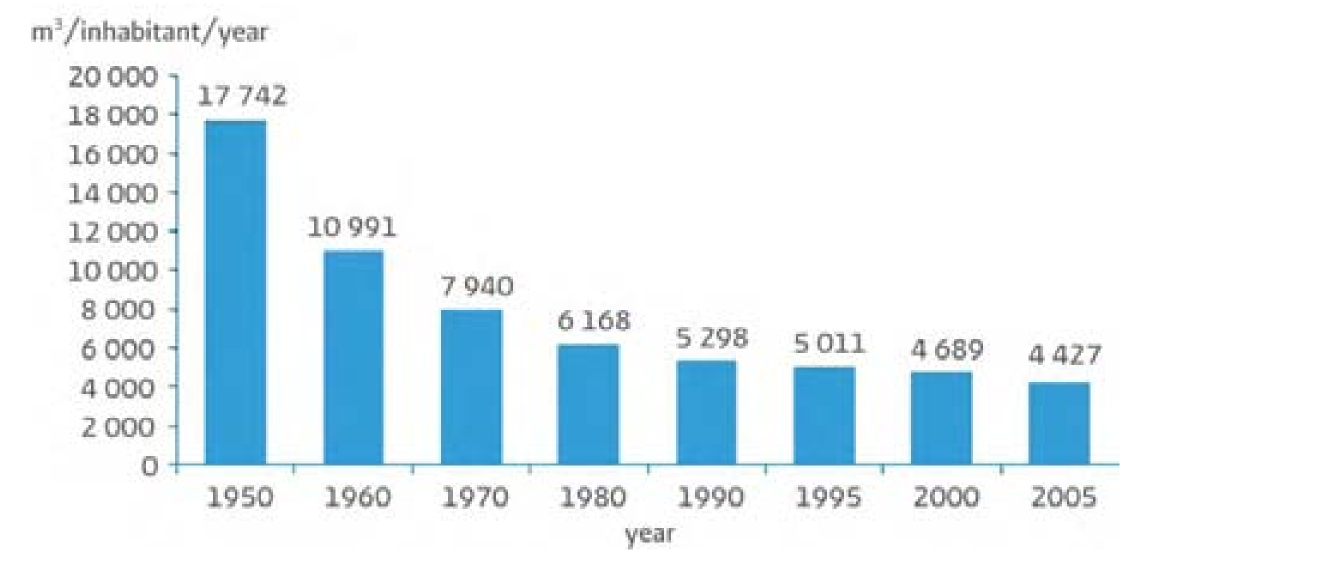
The mean natural per capita availability, which can be calculated by dividing the national value by the number of inhabitants, has decreased from 18 035 m^3/inhabitant/year in 1950 to only 4 312 in 2007. In the graph G2.2, it may be observed how this value has decreased.

G2.1 Mean annual values of the components of the hydrologic cycle in Mexico
(millions of cubic meters, hm^3)



SOURCE: CONAGUA. Deputy Director General's Office for Technical Affairs. I = Imports from other countries = 49744 hm^3 E= Exports to other countries = 432 hm^3

G2.2 Variation in the mean natural per capita availability of water, from 1950 to 2005
(m³/inhabitant/year)



NOTE: The total natural availability, in millions of cubic meters per year, is 458 100.
For the years 1950, 1960, 1970, 1980, 1990 and 2000, the population data was interpolated on December 31st every year based on the figures from INEGI's Censuses.
For 1995 and 2005, interpolation was also carried out on December 31st of each year, based on INEGI's Censuses.
SOURCE: CONAGUA. Deputy Director General's Office for Technical Affairs. Mexico, 2008.

It is worth mentioning that the availability should be analyzed from three perspectives:

- Seasonal distribution, since in Mexico there is a great variation in availability throughout the year. The majority of the rainfall occurs in the summer, whereas the rest of the year is relatively dry.
- Geographical distribution, since some regions of the country have an abundant precipitation and low population density, whereas in others exactly the opposite occurs.
- The area of analysis, since water problems are predominantly local in scale. Indicators calculated on a greater scale may hide some strong variations which exist throughout the country.

In some Hydrological-Administrative Regions, such as XIII Waters of the Valley of Mexico, VI Rio Bravo and VIII Lerma-Santiago-Pacific, the mean natural per capita availability is alarmingly low. In the following table the availability for each of the Hydrological-Administrative Regions may be observed:

T2.2 Mean natural per capita availability, by Hydrological-Administrative Region, 2007

Hydrological-Administration Region		Total mean natural availability[a] (hm³/year)	Population in December 2007 (millions of inhabitants)	Mean natural per capita availability 2007 (m³/inhabitant/year)	Total mean natural surface runoff (hm³/year)	Mean total groundwater recharge[a] (hm³/year)
I	Baja California Peninsula	4 616	3.58	1 289	3 367	1 249
II	Northwest	8 204	2.57	3 192	5 074	3 130
III	Northern Pacific	25 627	3.96	6 471	22 364	3 263
IV	Balsas	21 651	10.54	2 055	17 057	4 601
V	Southern Pacific	32 794	4.12	7 960	30 800	1 994
VI	Rio Bravo	12 024	10.70	1 124	6 857	5 167
VII	Central Basins of the North	7 780	4.12	1 888	5 506	2 274
VIII	Lerma-Santiago-Pacific	34 037	20.63	1 650	26 351	7 686
IX	Northern Gulf	25 500	4.94	5 162	24 227	1 274
X	Central Gulf	95 455	9.58	9 964	91 606	3 849
XI	Southern Border	157 754	6.50	24 270	139 739	18 015
XII	Yucatan Peninsula	29 645	3.90	7 603	4 329	25 316
XIII	Waters of the Valley of Mexico	3 008	21.09	143	1 174[b]	1 834
Total		458 100	106.23	4 312	378 449	79 651

NOTES: The sums may not add up precisely due to the rounding up or down of the figures.
The quantities expressed in this table are indicative and for planning purposes only; they may be used themselves to carry out water concessions or to determine the feasibility of any given project.
[a] The mean values refer to historical values, according to the availability of hydrological studies.
[b] Includes the wastewater produced in the Metropolitan Zone of the Valley of Mexico.
SOURCE: CONAGUA. Deputy Director General's Office for Planning. Produced based on data from:
CONAGUA. Deputy Director General's Office for Technical Affairs.
CONAPO. Population Projections in Mexico 2005-2050. Mexico, 2007.

Precipitation

The country's normal precipitation in the period from 1941 to 2000 was 759.6 mm. According to the WMO, the "normal" values correspond to periodic measurements, calculated for a uniform and relatively long period, which must be at least 30 years of data, which is considered as a minimum representative climatological period, and which starts on January 1st of a year ending with one, and ends on December 31st of a year ending in zero.

It is worth mentioning that the monthly distribution of the precipitation in particular accentuates the problems related with the availability of water, since 68% of the normal monthly precipitation falls between the months of June and September.

G2.3 Normal monthly precipitation in Mexico, in the period 1971-2000
(millimeters)

SOURCE: CONAGUA. Deputy Director General's Office for Technical Affairs, General Coordination of the National Meteorological Service.

T2.3 Monthly normal precipitation, by Hydrological-Administrative Region, in the period from 1971-2000
(millimeters)

Hydrological-Administrative Region	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
I Baja California Peninsula	23.1	21.8	17.1	4.2	1.1	0.5	9.0	22.6	25.4	11.5	11.2	20.7	168.3
II Northwest	25.4	22.9	13.2	5.6	4.8	18.1	112.9	107.3	57.6	28.3	19.7	32.3	448.1
III Northern Pacific	26.7	12.5	6.8	5.3	9.0	63.2	187.6	191.3	134.8	52.5	29.2	28.7	747.7
IV Balsas	14.7	5.2	6.3	13.9	51.9	186.9	198.1	191.9	188.3	82.5	16.1	7.2	963.0
V Southern Pacific	9.0	8.1	7.7	20.4	79.3	243.5	205.0	223.8	247.4	110.6	20.6	9.1	1 184.6
VI Rio Bravo	16.0	12.3	9.6	16.1	29.9	48.8	75.1	81.0	80.4	35.4	14.8	16.5	435.9
VII Central Basins of the North	15.8	6.2	5.2	12.2	27.0	58.9	86.5	85.0	71.5	31.9	13.1	14.4	427.6
VIII Lerma-Santiago-Pacific	21.3	6.2	3.8	6.5	23.7	131.4	202.9	185.6	148.7	58.4	17.3	12.2	817.9
IX Northern Gulf	26.3	17.2	20.9	40.5	75.8	140.3	143.3	129.6	176.6	81.6	30.4	28.5	910.9
X Central Gulf	44.3	34.4	29.7	40.3	84.6	224.4	252.7	252.6	279.4	163.6	86.9	59.8	1 552.8
XI Southern Border	59.4	53.6	38.2	52.1	136.9	275.0	219.1	266.1	332.6	222.5	112.9	77.3	1 845.6
XII Yucatan Peninsula	46.6	31.6	28.4	37.9	84.6	170.7	161.1	175.8	212.2	144.7	73.7	51.9	1 219.2
XIII Waters of the Valley of Mexico	9.3	8.3	12.6	27.9	56.1	105.2	115.7	105.9	98.7	50.8	12.6	7.0	610.2
Total	**25.0**	**17.2**	**13.6**	**18.4**	**41.4**	**104.4**	**136.9**	**139.8**	**136.4**	**69.3**	**30.6**	**26.5**	**759.6**

SOURCE: CONAGUA. Deputy Director General's Office for Technical Affairs, General Coordination of the National Meteorological Service.

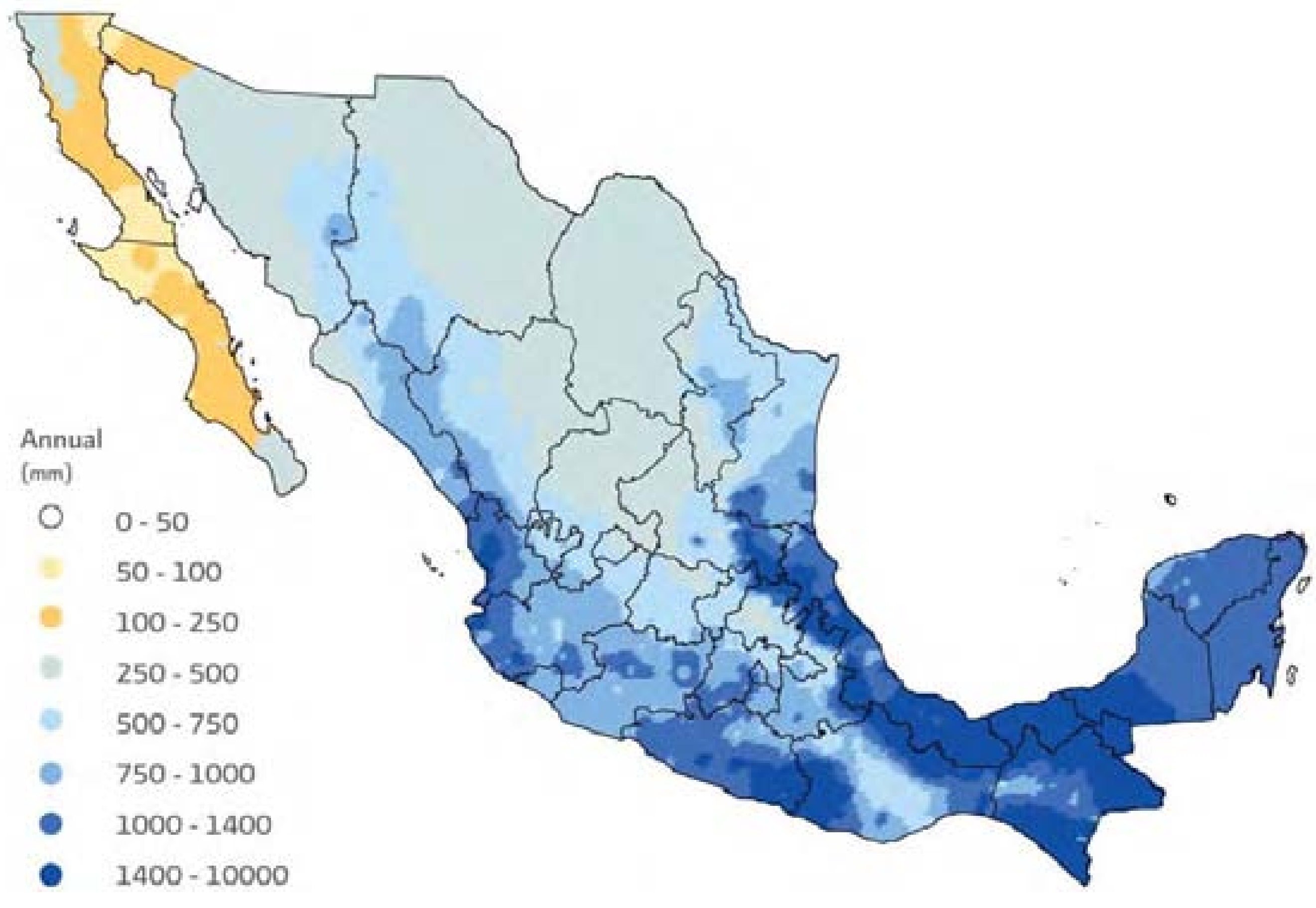
The following table presents the normal precipitation by state in the period from 1971 to 2000. It may be observed, for example, that in Tabasco, the rainiest state, the precipitation during this period was almost 13 times more than in Baja California Sur, the driest state. In the majority of states, the precipitation occurs mainly between June and September, with the exception of Baja California and Baja California Sur, where the rainfall is mainly in the winter.

T2.4 Normal monthly historical precipitation by state, in the period from 1971 to 2000
(millimeters)

	State	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
1	Aguascalientes	18.1	5.7	2.8	7.2	21.1	75.9	130.2	114.7	78.8	35.8	10.8	11.3	512.5
2	Baja California	30.8	34.6	30.6	7.8	1.7	0.6	3.9	8.0	9.0	10.9	13.5	24.2	175.7
3	Baja California Sur	15.6	9.1	3.8	0.6	0.6	0.5	14.2	37.0	41.5	12.1	8.9	17.2	161.0
4	Campeche	48.2	32.3	26.2	33.6	79.3	190.3	174.5	204.3	240.4	166.9	86.4	54.5	1336.8
5	Coahuila de Zaragoza	14.4	10.2	8.3	16.9	33.4	48.7	54.7	61.4	69.7	33.0	14.1	14.2	379.0
6	Colima	29.1	3.3	1.5	0.8	13.6	130.7	206.7	217.0	217.2	88.8	27.2	10.5	946.4
7	Chiapas	40.6	37.5	31.9	51.7	148.1	287.5	229.1	275.3	333.3	191.3	84.9	52.6	1763.9
8	Chihuahua	17.1	13.7	7.4	7.5	12.3	39.0	113.2	109.0	75.4	30.6	15.9	20.9	462.0
9	Durango	20.1	7.1	4.7	6.2	13.9	67.4	138.3	136.7	99.5	38.2	18.8	19.7	570.6
10	Federal District	9.6	6.6	12.3	29.6	69.2	168.6	194.0	192.3	161.4	73.6	12.9	7.2	937.4
11	Guanajuato	13.0	5.8	5.7	13.7	36.1	101.6	142.4	121.8	96.8	41.2	10.2	8.5	596.8
12	Guerrero	13.3	4.2	3.7	6.8	45.2	237.7	234.4	245.4	262.5	117.7	16.8	7.3	1195.0
13	Hidalgo	20.0	17.5	22.2	39.3	67.7	124.5	131.3	119.5	155.7	82.2	32.3	19.6	831.8
14	Jalisco	22.9	6.4	3.4	4.5	20.6	150.2	224.1	201.0	162.7	64.7	20.5	12.2	893.1
15	State of Mexico	13.3	8.1	10.2	23.0	61.9	155.7	176.5	165.7	145.1	66.9	15.5	8.8	850.6
16	Michoacan de Ocampo	21.8	4.3	4.0	6.9	30.8	157.2	208.6	197.6	175.4	77.7	18.2	8.7	911.1
17	Morelos	10.8	4.0	5.7	14.8	62.1	211.0	193.8	199.9	187.2	72.5	14.0	5.5	981.4
18	Nayarit	28.8	8.8	2.2	1.8	9.7	138.1	311.2	315.5	252.5	74.5	23.6	19.2	1185.8
19	Nuevo Leon	24.0	16.0	18.4	35.5	64.8	78.1	56.8	79.5	118.7	53.1	20.1	19.5	584.5
20	Oaxaca	14.3	13.8	12.9	27.8	90.2	225.3	205.9	214.1	223.7	101.6	33.1	19.2	1181.8
21	Puebla	19.1	17.0	21.4	39.5	83.3	183.6	166.9	160.3	190.6	95.9	35.7	20.7	1034.1
22	Queretaro Arteaga	15.4	10.2	15.6	27.3	52.6	120.4	133.9	117.7	133.4	60.8	22.4	14.8	724.4
23	Quintana Roo	53.9	35.2	32.9	44.7	96.8	167.8	155.6	160.4	204.0	144.5	79.5	59.2	1234.4
24	San Luis Potosi	20.5	10.7	13.0	29.7	59.8	110.8	126.5	98.8	127.0	56.5	19.8	19.3	692.5
25	Sinaloa	25.3	12.2	6.5	4.2	4.5	43.3	184.0	194.4	136.2	57.7	32.8	29.0	730.1
26	Sonora	24.5	22.3	13.0	5.2	4.0	14.7	105.4	101.0	53.4	27.2	18.9	31.7	421.2
27	Tabasco	114.6	101.0	57.4	55.3	107.6	241.2	191.4	242.3	332.3	315.1	194.5	149.3	2102.0
28	Tamaulipas	26.1	15.3	19.1	40.0	75.9	116.1	99.4	107.7	145.9	67.2	24.0	26.9	763.6
29	Tlaxcala	8.0	8.9	15.7	38.5	75.3	130.9	120.8	116.9	107.9	55.1	14.6	7.5	700.0
30	Veracruz de Ignacio de la Llave	53.1	40.1	33.6	43.1	84.2	217.8	250.7	246.4	293.5	178.7	97.9	71.4	1610.6
31	Yucatan	38.8	29.4	28.1	37.3	80.1	148.3	148.6	152.6	184.5	120.1	54.3	44.5	1066.6
32	Zacatecas	17.9	6.2	3.2	7.4	21.4	69.4	103.7	99.5	71.8	33.9	12.9	13.7	460.8
National		**25.0**	**17.2**	**13.6**	**18.4**	**41.4**	**104.4**	**136.9**	**139.8**	**136.4**	**69.3**	**30.6**	**26.5**	**759.6**

SOURCE: CONAGUA. Deputy Director General's Office for Technical Affairs, General Coordination of the National Meteorological Service.

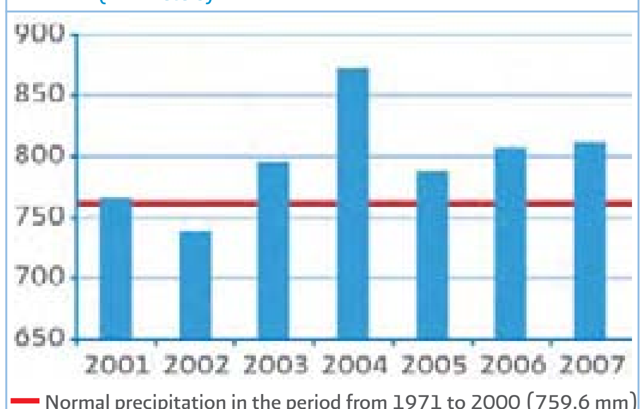
M2.3 Distribution of the annual precipitation in Mexico (1971-2000)



NOTE: Calculated based on the Geobase.
SOURCE: CONAGUA. Deputy Director General's Office for Technical Affairs, General Coordination of the National Meteorological Service.

The accumulated precipitation in the Mexican Republic from January 1st to December 31st, 2007 reached a sheet of 812.2 mm, which was 6.9% higher than the normal historical mean for the period from 1971 to 2000 (759.6 mm).

G2.4 Annual precipitation, period from 2001 to 2007
(millimeters)



Year	2001	2002	2003	2004	2005	2006	2007
Precipitation	766.1	739.0	796.1	872.5	788.2	808.2	812.2

SOURCE: CONAGUA. Deputy Director General's Office for Technical Affairs, General Coordination of the National Meteorological Service. 2008.

2.3 Meteorological Phenomena

Tropical cyclones

Tropical cyclones are natural phenomena that should be given high priority, since the majority of the movement of sea humidity to the semi-arid zones of the countries occurs through them. In various regions of the country, cyclonic rains represent the majority of the annual precipitation.

Cyclones are classified according to the intensity of the maximum winds sustained. When they are stronger than 119 km/h (33.1 m/s), they are referred to as hurricanes; when they are between 61 km/h (16.9 m/s) and 119 km/h (33.1 m/s), they are tropical storms; and when the winds are less than 61 km/h (16.9 m/s), they are tropical depressions.

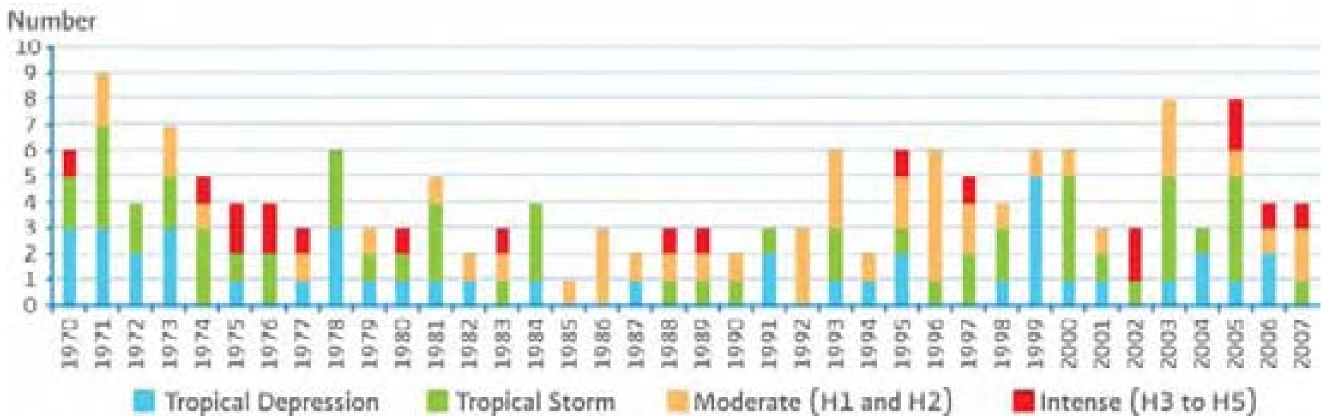
Between 1970 and 2007, 162 tropical cyclones hit Mexico's coasts. The following table lists the number that has hit the Atlantic and Pacific Oceans, through which it may be observed that despite the fact that a greater number of cyclones has hit the Pacific Coast, there have been more intense hurricanes in the Atlantic side.

The table T2.6 presents the number of tropical cyclones that hit Mexico in the period from 1970 to 2007, according to their category.

T2.5 Tropical cyclones that hit Mexico between 1970 and 2007

Ocean	Tropical depressions	Tropical storms	Moderate hurricanes (H1 and H2)	Intense hurricanes (H3-H5)	Total number
Atlantic	22	18	10	11	61
Pacific	20	38	35	8	101
Total	42	56	45	19	162

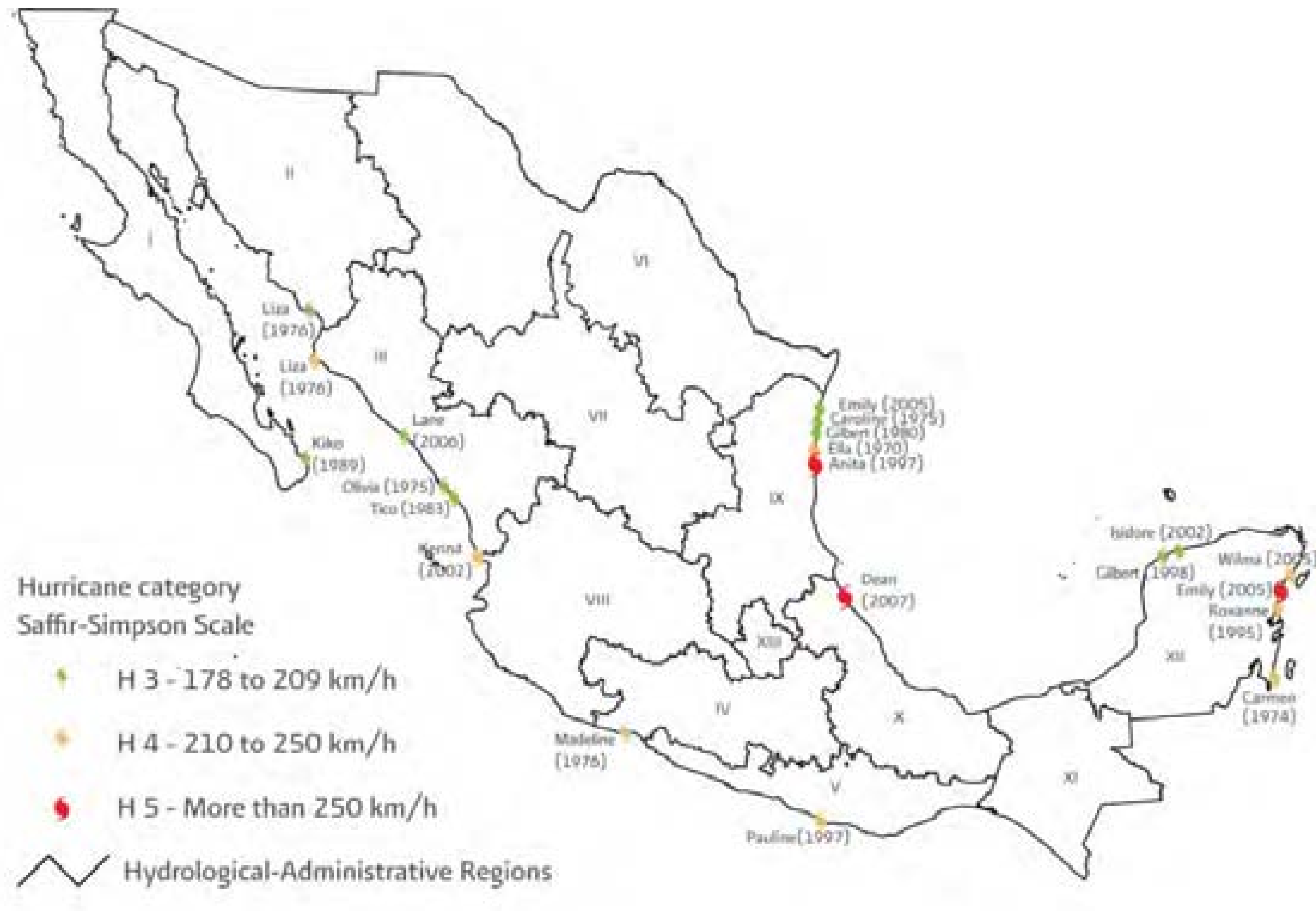
G2.5 Tropical cyclones that hit Mexico between 1970 and 2007



SOURCE: CONAGUA. Deputy Director General's Office for Technical Affairs, General Coordination of the National Meteorological Service.

The following shows a map and a chronological list of the 19 intense hurricanes (categories 3, 4 or 5) that hit Mexico between 1970 and 2007.

M2.4 Intense hurricanes (categories 3, 4 and 5), in the period from 1970 to 2007



SOURCE: CONAGUA. Deputy Director General's Office for Planning. Produced based on data from the Deputy Director General's Office for Technical Affairs, General Coordination of the National Meteorological Service.

T2.6 Intense hurricanes that hit Mexico, according to the starting date, in the period from 1970 to 2007

No.	Name of the hurricane	Place(s) in which it hit ground[a]	Date of occurrence	Maximum speed (km/h)	Category[b]	Costa
1	Ella	Akumal, Quintana Roo, [La Pesca,Tamaulipas]	Sep 8th - 13th, 1970	55 [195]	TD [H3]	Atlantic
2	Carmen	Punta Herradura, Quintana Roo	Aug 29th - Sep 10th, 1974	222	H4	Atlantic
3	Caroline	La Pesca, Tamaulipas	Aug 24th - Sep 1st, 1975	185	H3	Atlantic
4	Olivia	Villa Union, Sinaloa	Oct 22nd - 25th, 1975	185	H3	Pacific
5	Liza	La Paz BCS, [Topolobampo, Sinaloa]	Sep 25th - Oct 2nd, 1976	220 [215]	H4	Pacific

(continues)

(continued)

T2.6 Intense hurricanes that hit Mexico, according to the starting date, in the period from 1970 to 2007

No.	Name of the hurricane	Place(s) in which it hit ground[a]	Date of occurrence	Maximum speed (km/h)	Category[b]	Costa
6	Madeline	B. Petacalco, Guerrero	Sep 28th - Oct 8th, 1976	230	H4	Pacific
7	Anita	La Pesca, Tamaulipas	Aug 29th - Sep 3rd, 1977	280	H5	Atlantic
8	Allen	Lauro Villar, Tamaulipas	Jul 31st -Aug 11th, 1980	185	H3	Atlantic
9	Tico	Caimanero, Sinaloa	Oct 11th - 19th, 1983	205	H3	Pacific
10	Gilbert	Puerto Morelos, Quintana Roo [La Pesca, Tamaulipas]	Sep 8th - 20th, 1988	287[215]	H5 [H4]	Atlantic
11	Kiko	Los Muertos Bay, Baja California Sur	Aug 24th - 29th, 1989	195	H3	Pacific
12	Roxanne	Tulum, Quintana Roo [Martinez de la Torre, Veracruz de Ignacio de la Llave] [Punta Canoas, Baja California]	Oct 8th - 20th, 1995	185 [45]	H3 [TD]	Atlantic
13	Pauline	Puerto Angel, Oaxaca [Acapulco, Guerrero]	Oct 6th - 10th, 1997	195 [165]	H3 [H2]	Pacific
14	Isidore	Telchac Puerto, Yucatan	Sep 14th - 26th, 2002	205	H3	Atlantic
15	Kenna	San Blas, Nayarit	Oct 21st - 25th, 2002	230	H4	Pacific
16	Emily	20 km North of Tulum, Quintana Roo [El Mezquite, Tamaulipas]	Jul 10th - 21st, 2005	215	H4 [H3]	Atlantic
17	Wilma	Isla Cozumel [Puerto Morelos, Quintana Roo]	Oct 15th - 25th, 2005	230[220]	H4	Atlantic
18	Lane	Cruz de Elota, Sinaloa	Sep 13th - 17th, 2006	205	H3	Pacific
19	Dean	Puerto Bravo, Quintana Roo [Tecolutla, Veracruz de Ignacio de la Llave]	Aug 13th - 23th, 2007	260 [155]	H5 [H2]	Atlantic

NOTE: [a] When the hurricane hit ground in two places, the second is indicated in brackets.
[b] Categories:
TD= Tropical depression (a tropical cyclone in which the mean maximum surface wind is 62 km/h or less).
TS= Tropical storm (a well-organized tropical cyclone with a hot core in which the mean maximum surface wind is between 63 km/h and 117 km/h).
H= Hurricane (a tropical cyclone with a hot core in which the mean maximum surface wind is 118 km/h or more).

The Saffir / Simpson Hurricane Scale, according to the wind speed in km/h:

H1	119 to 153
H2	154 to 177
H3	178 to 209
H4	210 to 250
H5	More than 250

SOURCE: CONAGUA. Deputy Director General's Office for Technical Affairs, General Coordination of the National Meteorological Service.
National Weather Service of the United States of America. www.nhc.noaa.gov/aboutsshs.shtml. June 2007.

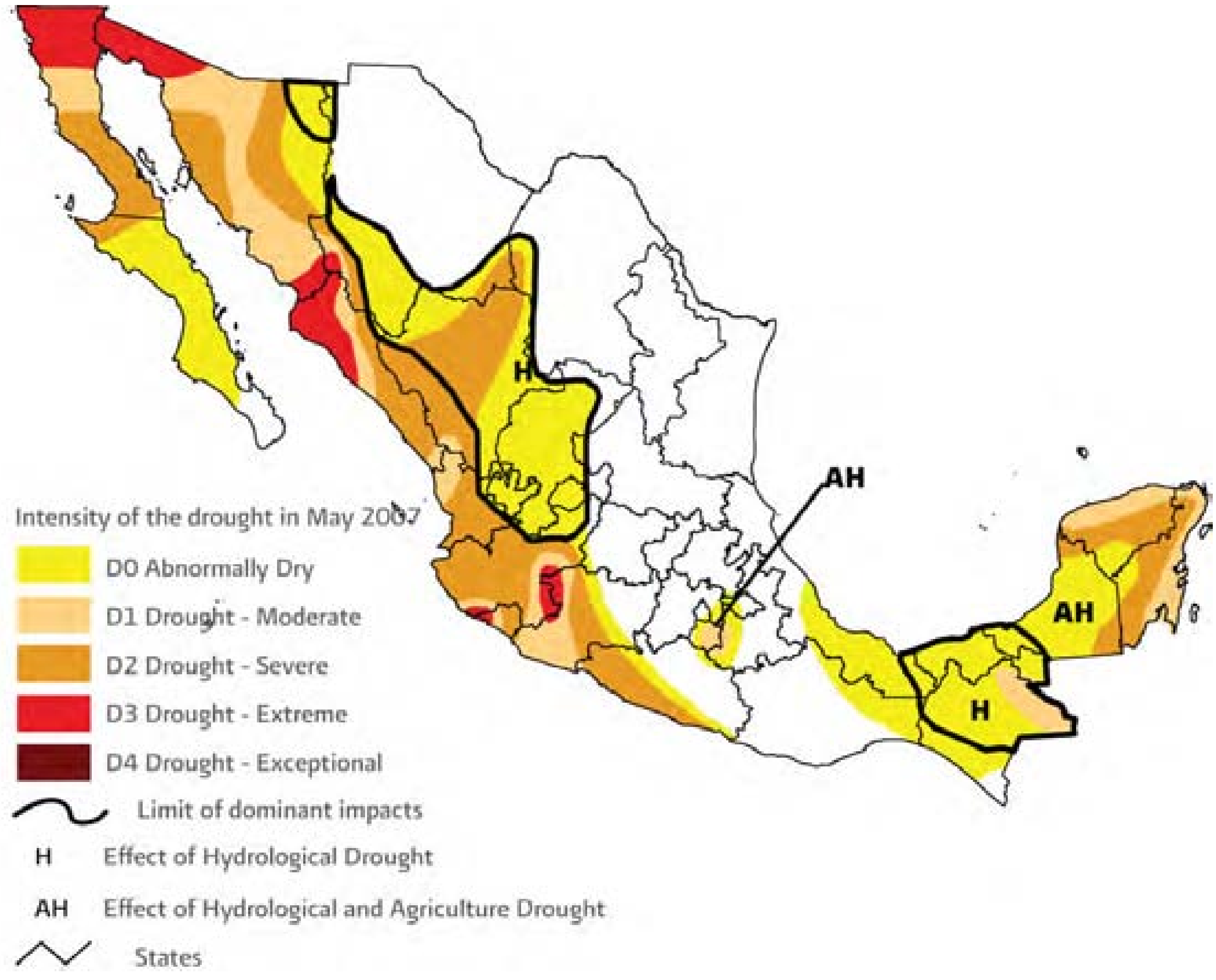
Droughts

August 2007 was warmer than normal, with an average temperature of 24.2 °C, whereas the normal temperature is 23.5 °C. Nationwide, the precipitation in May was 38.8 millimeters, slightly below the climatological average which is 40.2 millimeters. The National Meteorological Service (NMS) ranked May 2007 as the 37th wettest month since 1941.

The maximum average temperatures showed that May was 32.2 °C on average. The maximum average temperatures extended over the northwest of Sonora, the states of the Eastern Sierra Madre mountain range, affecting the northwest of Chihuahua, Sinaloa and a part of the west side of Durango, Nayarit, Guanajuato, Michoacan, Guerrero, Oaxaca and Chiapas.

Conditions of extreme drought (D3) and severe drought (D2) spread through the northwest and west of Mexico in May, in response to the persistent drought conditions that developed the previous November. The above-average temperatures in this region exacerbated the drought conditions, despite the reserve levels remaining higher than the previous year (2006). The severe drought (D2) and extreme drought conditions

M2.5 Conditions of drought at the end of the dry season, 2007



SOURCE: CONAGUA. Deputy Director General's Office for Planning. Produced based on data from the Deputy Director General's Office for Technical Affairs, General Coordination of the National Meteorological Service.
http://smn.cna.gob.mx/productos/sequia

also intensified in Guerrero, Michoacan and Jalisco as a result of a very dry period from November to May with a warm climate at the end of spring.

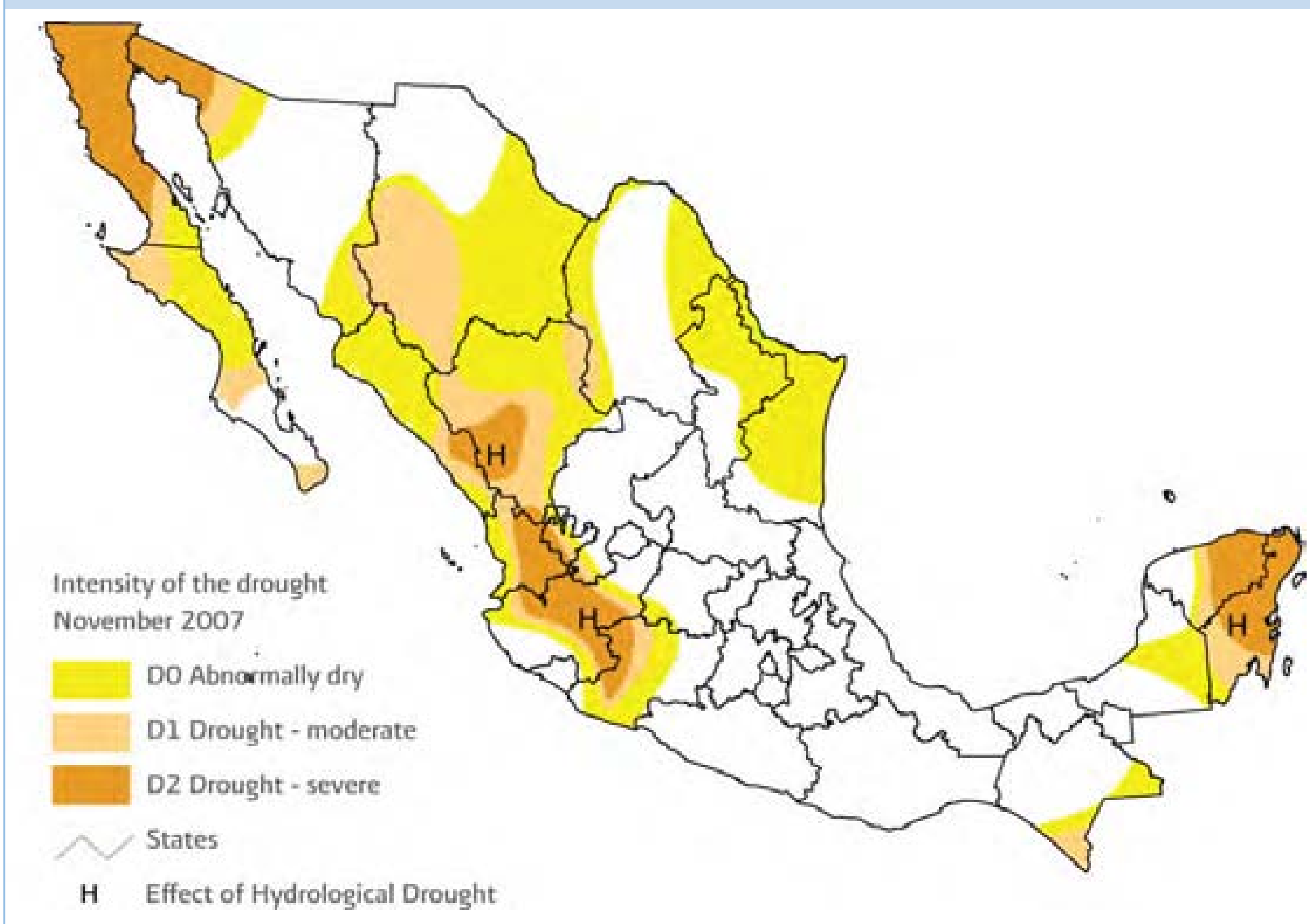
In April 2007, abnormally dry drought conditions (D0) were observed in Veracruz and moderate drought conditions (D1) spread through Tabasco and Chiapas. The maximum conditions of severe drought (D2) to moderate drought (D0) were observed in the Yucatan peninsula in the middle of May, but the strong rainfall at the end of the month began to invert the drought that had intensified since the last rainfall.

In November 2007, the country's average precipitation was 23.9 millimeters, 24% below the climatological average. The National Meteorological Service classified this month as the 17th driest November in the period 1941-2006. The states with rainfall above the climatological average were: Baja California Sur, Sonora, Baja California, Chihuahua, Veracruz de Ignacio de la Llave and Quintana Roo. The rest of the country registered rainfall below the normal level, in particular: Morelos, Guerrero, Colima, Nayarit, Aguascalientes, Oaxaca, Campeche and Chiapas.

In the south of the Baja California peninsula and in some regions of the northwest of Sonora, the drought conditions diminished compared to the previous month. However, a new area classified as D1 was registered in the extreme south of the peninsula.

The areas of D0 drought in the northeast region of

M2.6 Drought conditions at the end of the rainy season, 2007



SOURCE: CONAGUA. Deputy Director General's Office for Planning. Produced based on data from the Deputy Director General's Office for Technical Affairs, General Coordination of the National Meteorological Service.
http://smn.cna.gob.mx/productos/sequia

Mexico increased, especially in the states of Coahuila, Nuevo Leon and Tamaulipas. The classification (D1) remains strong in Chihuahua, Sinaloa, Durango, Nayarit, Zacatecas, Jalisco and Michoacan.

In the southeast of the country, a new region with a classification of D0-D1 developed, in the south and east of Chiapas, as well as a new area (D0) in the territory of Campeche. To the east of the Yucatan peninsula, the moderate drought conditions deteriorated to the classification of severe (D1-D2).

The aforementioned is based on the North American Drought Monitor (NADM), which is drawn up monthly between Mexico, Canada and the United States of America.

2.4 Surface water

Rivers

Mexico's rivers and streams constitute a hydrographic network of 633 thousand kilometers, in which 50 main rivers stand out since 87% of the country's surface runoff flows through them, and their catchments cover 65% of the country's mainland surface area.

Two thirds of the surface runoff belongs to seven rivers: Grijalva-Usumacinta, Papaloapan, Coatzacoalcos, Balsas, Panuco, Santiago and Tonala. The surface area of their catchments represents 22% of the country's surface. The Balsas and Santiago flow into the Pacific Ocean and the other five flow into the Gulf of Mexico. For the surface they cover, the catchments of the

M2.7 Main rivers with their catchments or river basins

NOTE: The main rivers are those that are accommodated in catchments of more than 200 000 square kilometers.
SOURCE: CONAGUA. Deputy Director General's Office for Planning.
Produced based on data from the Deputy Director General's Office for Technical Affairs.

Grande and Balsas rivers stand out, and for their length, the Grande and Grijalva-Usumacinta rivers. The Lerma, Nazas and Aguanaval are inland rivers. In the following map, the most important data on the country's rivers is presented, according to the water body into which they flow:

T2.7 Characteristics of the main rivers that flow into the Pacific Ocean and Gulf of California, ordered by their mean natural surface runoff

No.	River	Hydrological-Administrative Region		Mean natural surface runoff[a] (millions of cubic meters/year)	Area of the catchment (km^2)	Length of the river (km)	Maximum order
1	Balsas	IV	Balsas	16 587	117 406	770	7
2	Santiago	VIII	Lerma-Santiago-Pacific	7 849	76 416	562	7
3	Verde	V	South Pacific	5 937	18 812	342	6
4	Ometepec	V	South Pacific	5 779	6 922	115	4
5	Fuerte	III	North Pacific	5 176	33 590	540	6
6	Papagayo	V	South Pacific	4 237	7 410	140	6
7	San Pedro	III	North Pacific	3 417	26 480	255	6
8	Yaqui	II	Northwest	3 163	72 540	410	6
9	Culiacan	III	North Pacific	3 161	15 731	875	5
10	Suchiate[b]	XI	Southern Border	2 737	203	75	2
11	Ameca	VIII	Lerma-Santiago-Pacific	2 236	12 214	205	5
12	Sinaloa	III	North Pacific	2 126	12 260	400	5
13	Armeria	VIII	Lerma-Santiago-Pacific	2 015	9 795	240	5
14	Coahuayana	VIII	Lerma-Santiago-Pacific	1 867	7 114	203	5
15	Colorado[b]	I	Baja California Peninsula	1 863	3 840	160	6
16	Baluarte	III	North Pacific	1 838	5 094	142	5
17	San Lorenzo	III	North Pacific	1 680	8 919	315	5
18	Acaponeta	III	North Pacific	1 438	5 092	233	5
19	Piaxtla	III	North Pacific	1 415	11 473	220	5
20	Presidio	III	North Pacific	1 250	6 479	NA	4
21	Mayo	II	Northwest	1 232	15 113	386	5
22	Tehuantepec	V	South Pacific	950	10 090	240	5
23	Coatan[b]	XI	Southern Border	751	605	75	3
24	Tomatlan	VIII	Lerma-Santiago-Pacific	668	2 118	NA	4
25	Marabasco	VIII	Lerma-Santiago-Pacific	648	2 526	NA	5
26	San Nicolas	VIII	Lerma-Santiago-Pacific	543	2 330	NA	5
27	Elota	III	North Pacific	506	2 324	NA	4
28	Sonora	II	Northwest	408	27 740	421	5
29	Concepcion	II	Northwest	123	25 808	335	2
30	Matape	II	Northwest	90	6 606	205	4
31	Tijuana[b]	I	Baja California Peninsula	78	3 203	143	4
32	Sonoyta	II	Northwest	16	7 653	311	5
Total				**81 781**	**563 906**	**8 318**	

NOTES: 1 hm^3 = 1 million cubic meters
[a] The data on mean natural surface runoff represent the mean annual value of their historical registry and include the runoff of the transboundary catchments.
[b] The mean natural surface runoff of this river includes imports from other countries. The area and length of the catchment refer only to the Mexican part.
NA: Not available.
Order determined according to the Strahler method.
SOURCE: CONAGUA. Deputy Director General's Office for Technical Affairs.

T.2.8. Characteristics of the main rivers that flow into the Gulf of Mexico and Caribbean Sea, ordered by their mean natural surface runoff

No.	River	Hydrological-Administrative Region		Mean natural surface runoff[a] (millions of cubic meters/year)	Area of the catchment (km^2)	Length of the river (km)	Maximum order
33	Grijalva-Usumacinta[b]	XI	Southern Border	115 536	83 553	1 521	7
34	Papaloapan	X	Central Gulf	44 662	46 517	354	6
35	Coatzacoalcos	X	Central Gulf	28 093	17 369	325	5
36	Panuco	IX	Northern Gulf	20 330	84 956	510	7
37	Tonala	XI	Southern Border	11 389	5 679	82	5
38	Tecolutla	X	Central Gulf	6 095	7 903	375	5
39	Bravo[b,c]	VI	Rio Bravo	5 588	226 280	2 018	7
40	Jamapa	X	Central Gulf	2 563	4 061	368	4
41	Nautla	X	Central Gulf	2 217	2 785	124	4
42	La Antigua	X	Central Gulf	2 139	2 827	139	5
43	Soto La Marina	IX	Northern Gulf	2 086	21 183	416	6
44	Tuxpan	X	Central Gulf	2 076	5 899	150	4
45	Candelaria	XII	Yucatan Peninsula	2 011	13 790	150	4
46	Cazones	X	Central Gulf	1 712	2 688	145	4
47	San Fernando	IX	Northern Gulf	1 545	17 744	400	5
48	Hondo	XII	Yucatan Peninsula	533	7 614	115	4
Total				**248 572**	**550 848**	**7 192**	

NOTES: [a] The data on mean natural surface runoff represent the mean annual value of their historical registry.
[b] The mean natural surface runoff of this river includes imports from other countries. The area and length of the catchment refer only to the Mexican part.
[c] Length of the border between Mexico and the United States of America.
Order determined according to the Strahler method.
SOURCE: CONAGUA. Deputy Director General's Office for Technical Affairs.

T2.9 Characteristics of the main inland rivers, ordered by the mean natural surface runoff

No.	River	Hydrological-Administrative Region	Mean natural surface runoff[a] (millions of cubic meters/year)	Area of the catchment (km^2)	Length of the river (km)	Maximum order
49	Lerma[b]	VIII Lerma-Santiago-Pacific	4 742	47 116	708	6
50	Nazas-Aguanaval	VII Central Basins of the North	1 912	89 239	1 081	7
Total			**6 654**	**136 355**	**1 789**	

NOTES: [a] The data on mean natural surface runoff represent the mean annual value of their historical registry.
[b] This river is considered an inland river because it flows into Lake Chapala.
Order determined according to the Strahler method.
SOURCE: CONAGUA. Deputy Director General's Office for Technical Affairs.

Mexico's transboundary catchments or river basins

Mexico shares eight catchments in total 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).

T2.10 Characteristics of the rivers with transboundary catchments, by Hydrological-Administrative Region

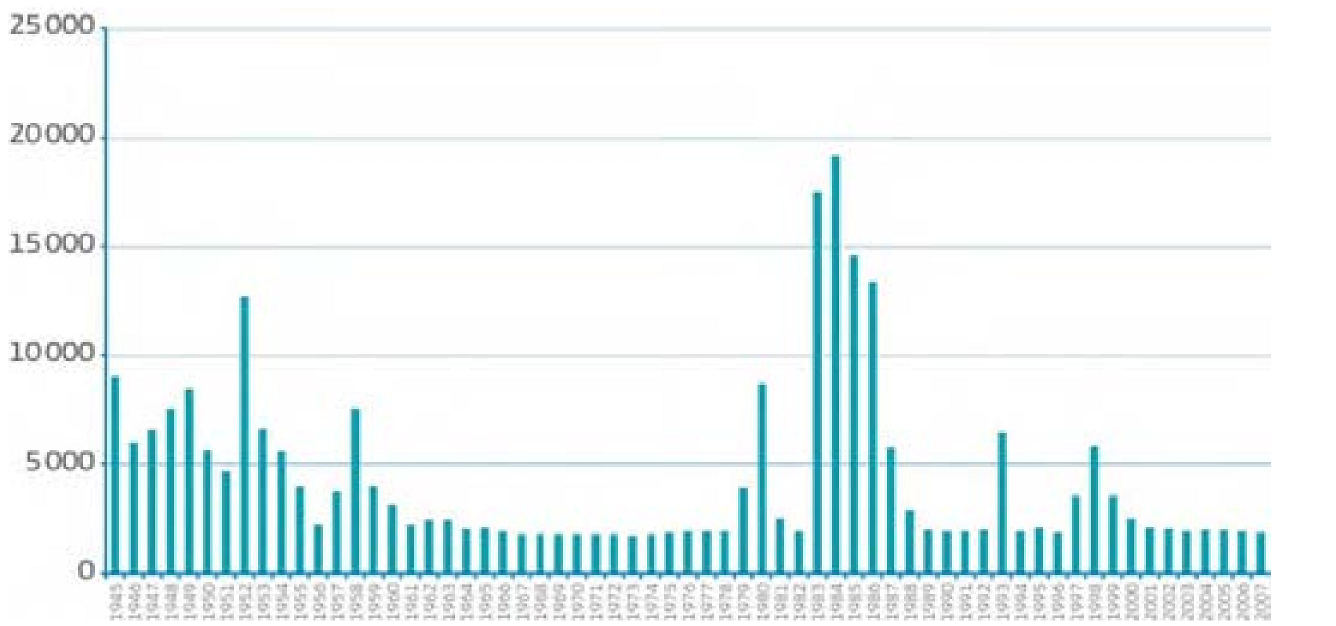
No.	River	Hydrological-Administrative Region	Country	Mean natural surface runoff (millions of cubic meters/year)	Area of the catchment (km^2)	Length of the river (km)
1	Grande	VI Rio Bravo	Mexico	5 588	225 242	NA
			USA	502	241 697	1 074
			Binational	NA	NA	2 034
2	Colorado	I Baja California Peninsula	Mexico	13	10 029	160
			USA	18 500	616 771	2 063
			Binational	NA	NA	29
3	Tijuana	I Baja California Peninsula	Mexico	78	3 203	143
			USA	92	1 221	9
4	Grijalva-Usumacinta	XI Southern Border	Mexico	71 716	83 553	1 521
			Guatemala	43 820	44 837	390
5	Suchiate	XI Southern Border	Mexico	184	203	75[a]
			Guatemala	2 553	1 084	60
6	Coatan	XI Southern Border	Mexico	354	605	75
			Guatemala	397	280	12
7	Candelaria	XII Yucatan Peninsula	Mexico	1 750	13 790	150
			Guatemala	261	1 558	8
8	Hondo	XII Yucatan Peninsula	Mexico	533	7 614	115[b]
			Guatemala	NA	2 873	45
			Belize	NA	2 978	16

NOTAS: 1 hm^3 = 1 million cubic meters
[a] The 75 km belong to the border between Mexico and Guatemala
[b] The 115 km belong to the border between Mexico and Belize
NA = Not Applicable
SOURCE: CONAGUA. Deputy Director General's Office for Technical Affairs.

The waters of the Grande, Colorado and Tijuana rivers are shared according to the indications of the Treaty on the Distribution of International Waters between the United Mexican States and the United States of America, signed in Washington, D.C. on February 3rd, 1944.

In the case of the Colorado River, the Treaty specifies that the United States of America must deliver 1 850.2 million cubic meters (1.5 million AF) each year to Mexico.

G2.6 Annual volume of water from the Colorado River delivered by the United States of America, annual series from 1945 to 2007
(millions of cubic meters, hm³)



SOURCE: CONAGUA. Deputy Director General's Office for Technical Affairs.

As regards the Tijuana River, the Treaty only establishes that both countries, through the International Boundary and Water Commission (IBWC), will make recommendations for the equitable distribution of its waters, will draw up projects for storage infrastructure and flood control, will estimate the costs and build the infrastructure that is agreed upon, sharing the construction and operation costs equitably.

As regards the Rio Grande (referred to in Mexico as the Rio Bravo), the distribution of its waters, shown in table T2.11, is established in the Treaty.

In the Treaty, three criteria are established regarding the six Mexican channels previously referred to, which should be mentioned:

1. The volume that Mexico must provide to the United States of America, as part of the third of the volume in the six aforementioned Mexican channels, shall not be greater on the whole, on average and in consecutive five-year cycles than 2 158.6 hm³ (1 750 000 AF), the equivalent of supplying a minimum volume of 431.72 hm³ (350 000 AF) each year during the five-year cycle.

T2.11 Distribution of the Rio Grande's waters

The United Mexican States' share	The United States of America's share
• The total of the runoff of the Alamo and San Juan rivers.	• The total of the runoff from the Pecos and Devils rivers, from the Goodenough spring and from the Alamito, Terlingua, San Felipe and Pinto streams.
• Two thirds of the water that enters the mainstream 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 enters the mainstream 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 the runoff not assigned in the Treaty that reaches the main channel, between Fort Quitman and Falcon.	• One half of the runoff not assigned in the Treaty that reaches the main channel, between Fort 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.

2. In cases of extraordinary drought or a serious accident in the hydraulic systems of the Mexican tributaries that might make it difficult for Mexico to allow the 431.72 hm^3 to flow, the remaining flow that exists at the end of the five-year cycle will be added to the following cycle with water from the same tributaries.

3. In the event that the United States of America's assigned capacity in the international dams shared by both countries (La Amistad and Falcon) is covered, the five-year cycle is considered finished and all volumes not yet delivered will be totally covered, a new cycle starting from that point.

T2.12 Capacities assigned in the international dams, 2007
(millions of cubic meters, hm^3)

Country	La Amistad	Falcon
Mexico	1 703	1 355
United States of America	2 185	1 918

SOURCE: CONAGUA. Coordination of Advisors of the Director General's Office.

Mexico's Main Lakes

Lake Chapala is the biggest inner lake in Mexico. It has an extension of 1 116 km² and has an average depth of between 4 and 6 m.

T2.13 Area and storage volume of Mexico's main lakes, by Hydrological-Administrative Region and state, 2007

No.	Lake	Area of the catchment (km²)	Storage capacity (hm³)	Hydrological-Administrative Region	State(s)
1	Chapala	1 116	8 126	VIII Lerma-Santiago-Pacific	Jalisco and Michoacan de Ocampo
2	Cuitzeo	306	920[a]	VIII Lerma-Santiago-Pacific	Michoacan de Ocampo
3	Patzcuaro	97	550[a]	VIII Lerma-Santiago-Pacific	Michoacan de Ocampo
4	Yuriria	80	188	VIII Lerma-Santiago-Pacific	Guanajuato
5	Catemaco	75	454	X Central Gulf	Veracruz de Ignacio de la Llave
6	Tequesquitengo	8	160[a]	IV Balsas	Morelos
7	Nabor Carrillo	10	12[a]	XIII Waters of the Valley of Mexico	State of Mexico

NOTE: [a] The data refers to the mean volume stored; no updated studies exist on their storage capacity.
SOURCE: CONAGUA. Deputy Director General's Office for Technical Affairs.

G2.7 G2.7 Volumes stored in Lake Chapala, from 1942 to 2007[a]
(Millions of cubic meters)

NOTES: 1 hm³ = 1 million cubic meters.
[a] The values indicated are on October 1st of every year.
SOURCE: CONAGUA. Deputy Director General's Office for Technical Affairs.

2.5 Groundwater

The importance of groundwater is manifest due to the magnitude of the volume employed by the main users; close to 37% (28.9 hm^3/year) of the total volume assigned for offstream uses is from groundwater sources. For the purpose of groundwater management, the country has been divided into 653 aquifers, the official names of which were published in the Official Government Gazette on December 5th, 2001. At the time of closing this edition, the availability of groundwater in 282 aquifers had been published in the Official Government Gazette. This information may be found in the compact disk that accompanies this edition.

Overexploitation of aquifers

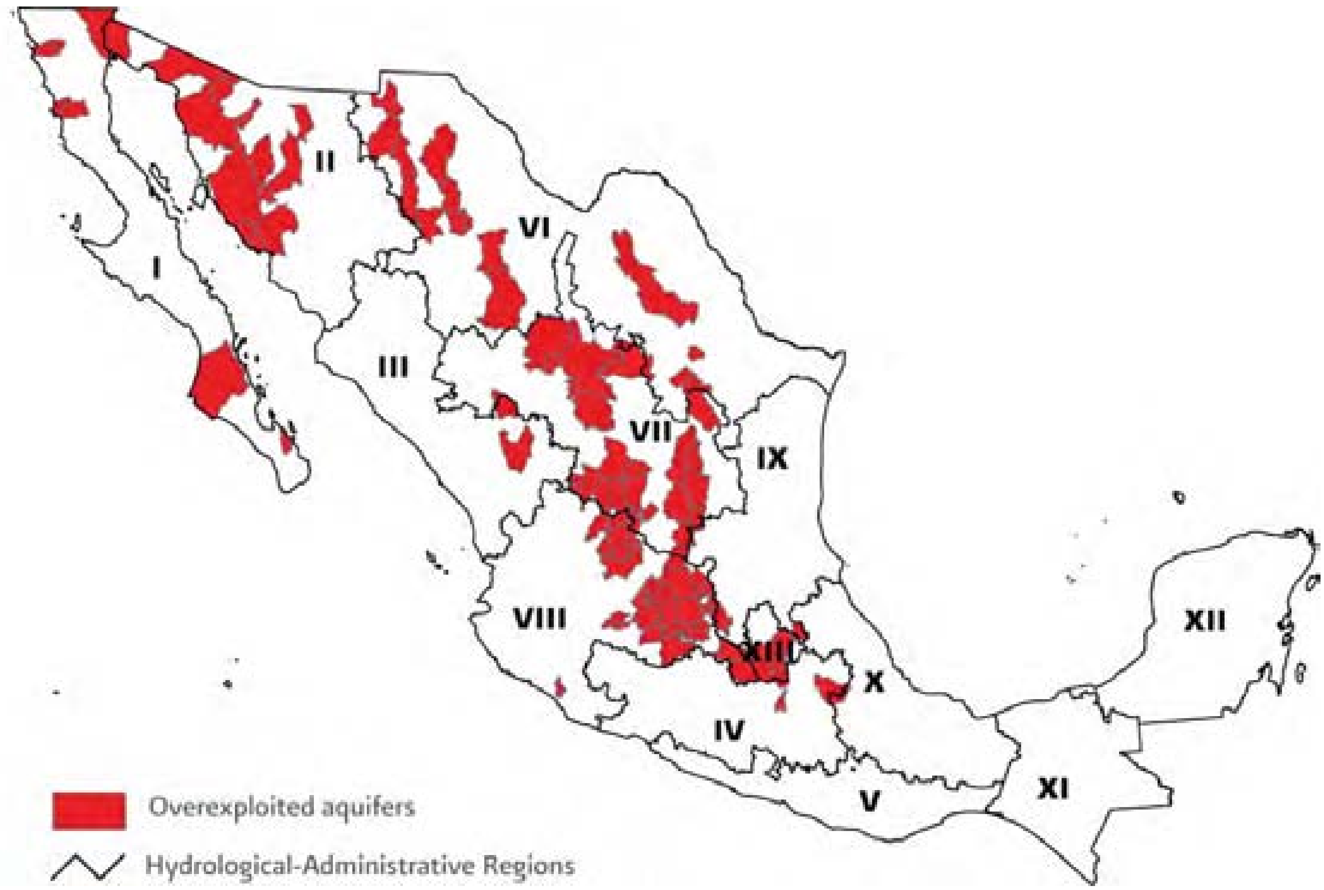
From the 1970s onwards, the number of overexploited aquifers has been growing steadily, from 32 in 1975, 36 in 1981, 80 in 1985, 97 in 2001, 102 in 2003 and 104 in 2006. However, in 2007 this number was reduced to 101. From these aquifers 58% of groundwater is extracted for all uses.

T2.14 Mexico's aquifers, by Hydrological-Administrative Region, 2007

Hydrological-Administrative Region	Number of aquifers				
	Total	Overexploited	With saltwater intrusion	Suffering from the phenomenon of soil salinization and brackish groundwater	Average recharge (hm^3)
I Baja California Peninsula	87	7	9	4	1 249
II Northwest	63	13	5	0	3 130
III Northern Pacific	24	2	0	0	3 263
IV Balsas	46	2	0	0	4 601
V Southern Pacific	35	0	0	0	1 994
VI Rio Bravo	100	15	0	4	5 167
VII Central Basins of the North	68	24	0	8	2 274
VIII Lerma-Santiago-Pacific	127	32	1	0	7 686
IX Northern Gulf	40	2	0	0	1 274
X Central Gulf	22	0	2	0	3 849
XI Southern Border	23	0	0	0	18 015
XII Yucatan Peninsula	4	0	0	1	25 316
XIII Waters of the Valley of Mexico	14	4	0	0	1 834
Total	**653**	**101**	**17**	**17**	**79 651**

SOURCE: CONAGUA. Deputy Director General's Office for Technical Affairs.

M2.8 Overexploited aquifers by Hydrological-Administrative Region, 2007



SOURCE: CONAGUA. Deputy Director General's Office for Technical Affairs.

To consult more detailed information on Mexico's overexploited aquifers, we recommend you read Annex D of the compact disk which accompanies this edition.

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

Saltwater intrusion is understood as the phenomenon in which seawater is introduced by the subsoil into the inner continent, causing the salinization of the groundwater; this occurs when the withdrawal of water causes the groundwater level to fall below sea level, thus altering the dynamic natural balance between seawater and freshwater.

The phenomenon of soil salinization and brackish groundwater are factors that affect groundwater; the former by causing the recharge with saltwater and the latter by inducing the transport of connate saltwater.

There are 17 aquifers in Mexico with problems of saltwater intrusion, situated in the states of Baja California, Baja California Sur, Colima, Sonora and Veracruz de Ignacio de la Llave. Among these are Maneadero and San Quintin in Baja California, Santo Domingo in Baja California Sur, Caborca, Hermosillo Coast, Guaymas Valley and San Jose de Guaymas in Sonora.

2.6 Water Quality

Monitoring of water quality

In 2007, the National Monitoring Network had 1 014 sites, distributed throughout the country as described in the following table:

T2.15 Sites of the National Monitoring Network, 2007

Network	Area	Sites (number)
Primary Network	Surface bodies	207
	Coastal zones	52
	Groundwater	130
Secondary Network	Surface bodies	241
	Coastal zones	19
	Groundwater	25
Special Studies	Surface bodies	81
	Coastal zones	47
	Groundwater	123
Groundwater Reference Network		89
Total		**1 014**

SOURCE: CONAGUA. Deputy Director General's Office for Technical Affairs.

The physio-chemical and biological determinations are carried out in the National Laboratory Network, which is made up of 13 laboratories in the River Basin Organizations, 17 in the local offices and one National Reference Laboratory in Mexico City.

In 2007, 191 surface water bodies were covered in 96 catchments, including 34 of the 50 water bodies of national importance, with fixed sites to evaluate the evolving trends in time (Primary Network).

In addition to the aforementioned physio-chemical and microbiological parameters, since 2005 biological monitoring has been carried out in some regions of the country, which allows water quality to be evaluated, using simple low-cost methods (the benthic organisms diversity index).

T2.16 Samples for biological monitoring, by selected Hydrological-Administrative Region, 2007

Hydrological-Administrative Region	No. of samples
IV Balsas	14
VII Central Basins of the North	30
IX Northern Gulf	1
X Central Gulf	9
XI Southern Border	1
Total	**55**

SOURCE: CONAGUA. Deputy Director General's Office for Technical Affairs.

Evaluation of water quality

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). The 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.

The BOD_5 determines the quantity of biodegradable organic matter whereas the 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 the water bodies with the consequent affectation of aquatic ecosystems. Additionally, the increase in COD indicates the presence of substances coming from non-municipal discharges.

The TSS originate in wastewater and through 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 levels to be identified that vary from a relatively normal condition or with no influence of human activity, to water which shows significant signs of municipal and non-municipal wastewater discharges, as well as areas with severe deforestation.

It should be mentioned that the sites with water quality monitoring are situated in areas with a high anthropogenic influence.

T2.17 Scales of classification of water quality

Criteria	Classification	Color
Biochemical Oxygen Demand (BOD_5)		
mg/L BOD_5 3	Excellent Not polluted	Blue
$3 < BOD_5 \leq 6$	Good quality Surface water with a low content of biodegradable organic matter	Green
$6 < BOD_5 \leq 30$	Acceptable With some signs of pollution. Surface water with a capacity of self-purification or with biologically treated wastewater discharges	Yellow
$30 < BOD_5 \leq 120$	Polluted Surface water with raw wastewater discharges, mainly of municipal origin	Orange
$BOD_5 > 120$	Heavily polluted Surface water with a strong impact of raw municipal and non-municipal wastewater discharges	Red
Chemical Oxygen Demand (COD)		
$COD \leq 10$	Excellent Not polluted	Blue
$10 < COD \leq 20$	Good quality Surface water with a low content of biodegradable and non-biodegradable organic matter	Green
$20 < COD \leq 40$	Acceptable With some signs of pollution. Surface water with a self-purification capacity or with biologically treated wastewater discharges	Yellow
$40 < COD \leq 200$	Polluted Surface water with raw wastewater discharges, mainly of municipal origin	Orange
$COD > 200$	Heavily polluted Surface water with a strong impact of raw municipal and non-municipal wastewater discharges	Red
Total Suspended Solids (TSS)		
$TSS \leq 25$	Excellent Exceptional, very high quality	Blue
$25 < TSS \leq 75$	Good Quality Surface water with a low suspended solids content, generally in natural conditions. Favors the conservation of aquatic communities and unrestricted agricultural irrigation	Green
$75 < TSS \leq 150$	Acceptable Surface water with some signs of pollution. With biologically treated wastewater discharges. A regular condition for fish. Restricted agricultural irrigation	Yellow
$150 < TSS \leq 400$	Polluted Poor quality surface water with raw wastewater discharges. Water with a high suspended material content	Orange
$TSS > 400$	Heavily polluted Surface water with a strong impact of raw municipal and non-municipal wastewater discharges with a high polluting load. Poor conditions for fish	Red

SOURCE: CONAGUA. Deputy Director General's Office for Technical Affairs.

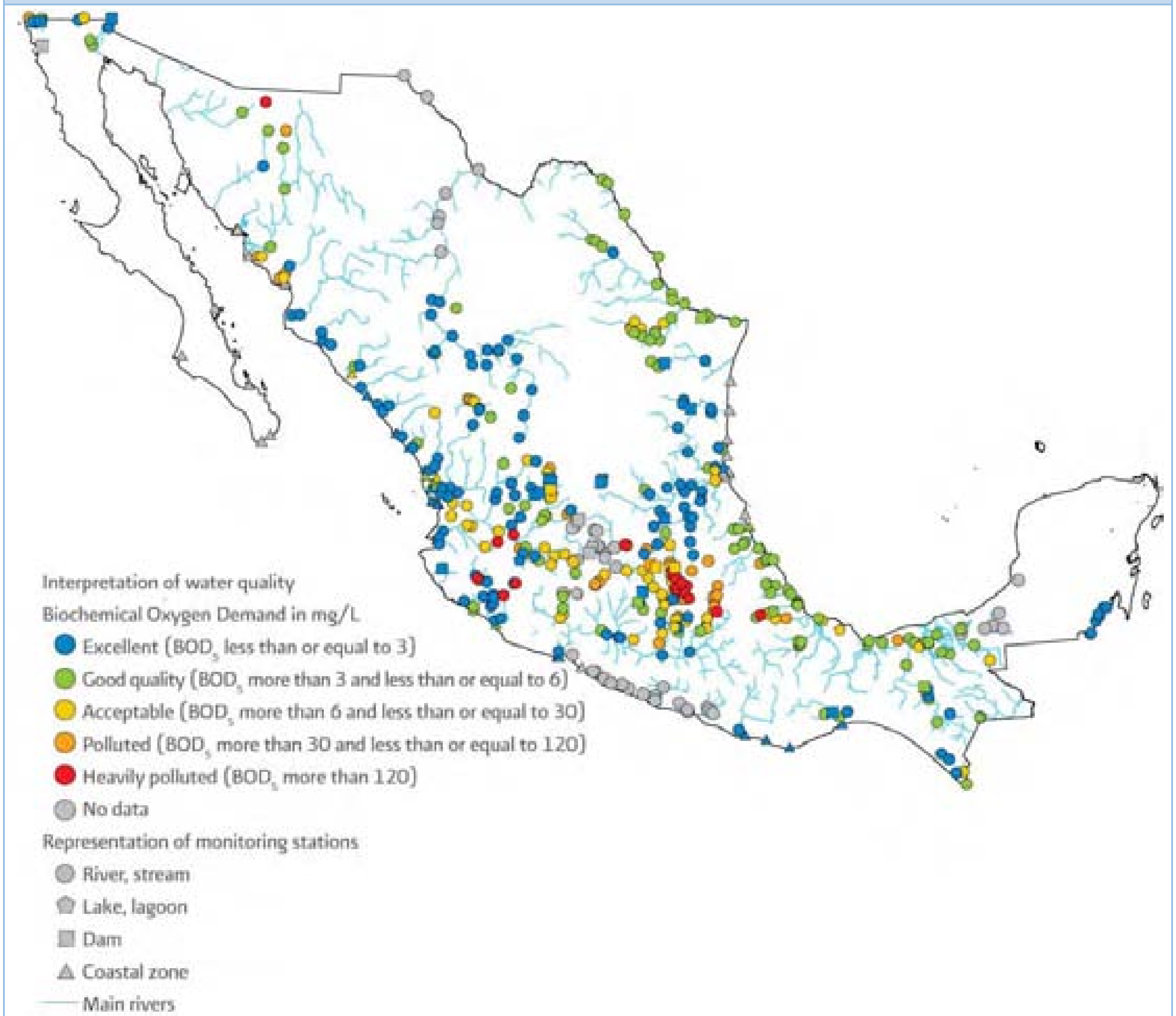
The evaluation of water quality in 2007 for these quality indicators was carried out at the sites mentioned in the following table:

T2.18 Monitoring sites, for each water quality indicator, 2007

Water quality indicator	Number of monitoring sites
Five-day Biochemical Oxygen Demand (BOD_5)	437
Chemical Oxygen Demand (COD)	397
Total Suspended Solids (TSS)	501

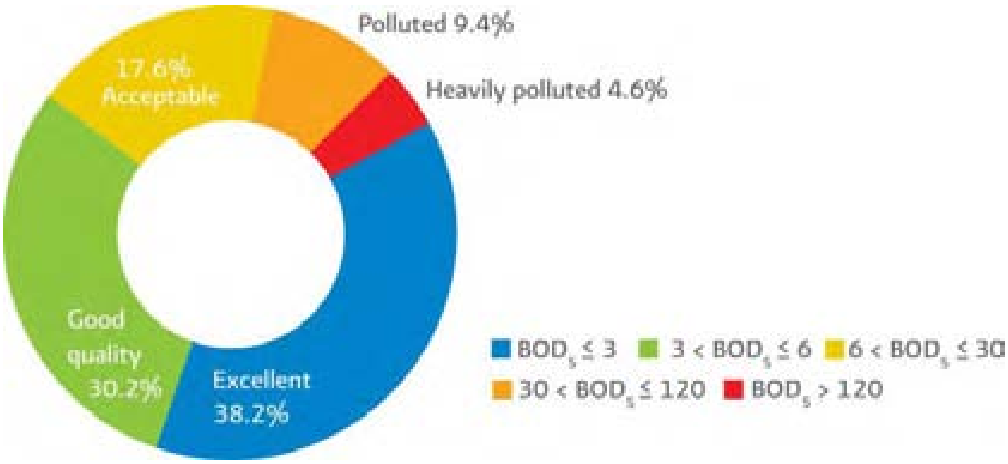
NOTE: The total number of sites is 503; however, the stations without data were not considered.
SOURCE: CONAGUA. Deputy Director General's Office for Technical Affairs.

M2.9 Water quality by BOD_5 indicator in surface water monitoring sites, 2007



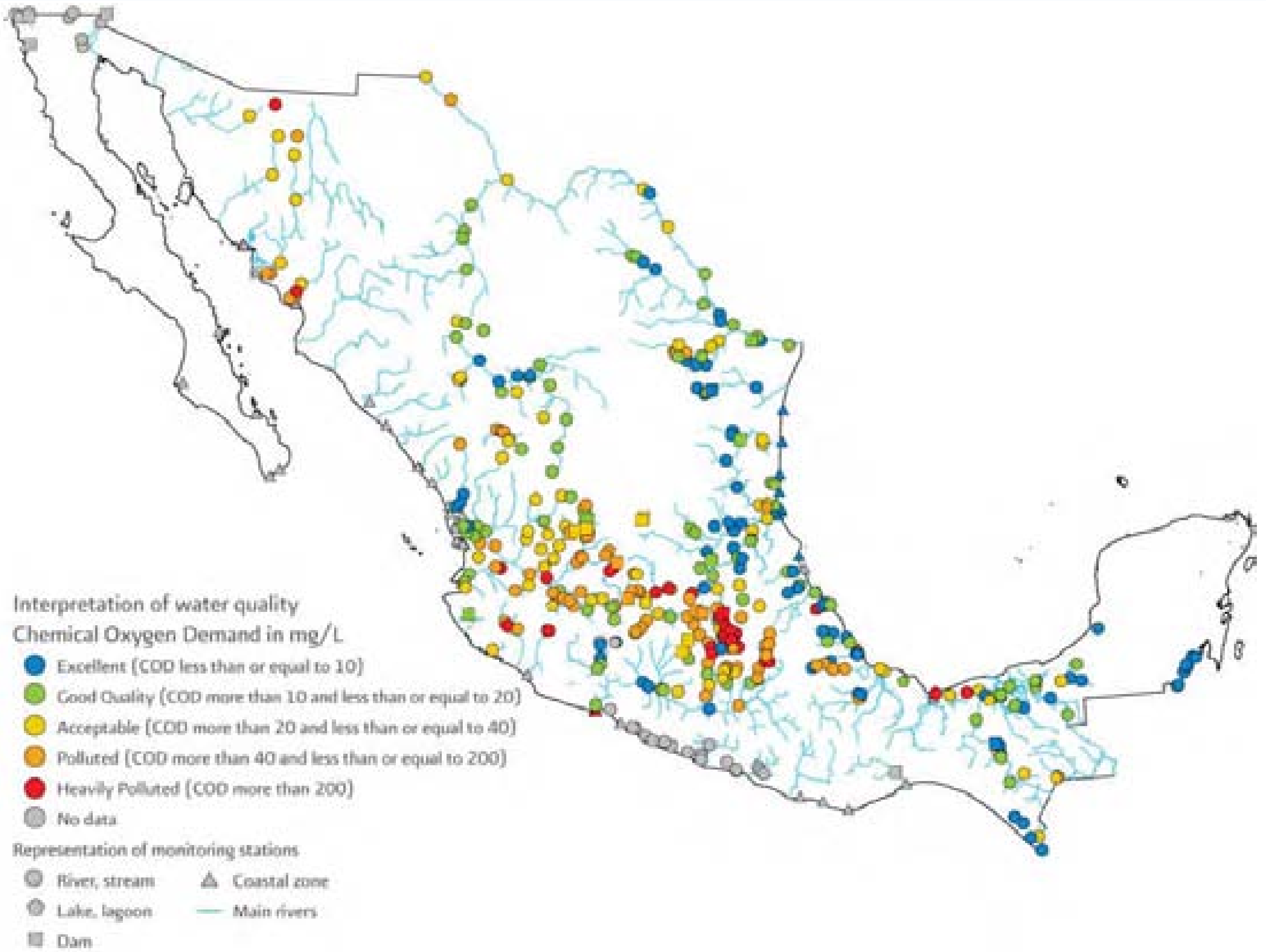
NOTE: Includes water quality monitoring sites in interior surface water bodies (rivers, streams, lakes, lagoons, dams, channels, drains and outlets) and in coastal zones (lagoons, estuaries, marshes and bays).
SOURCE: CONAGUA. Deputy Director General's Office for Technical Affairs.

G2.8 Percentage distribution of surface water quality monitoring sites, by category of BOD_5, 2007



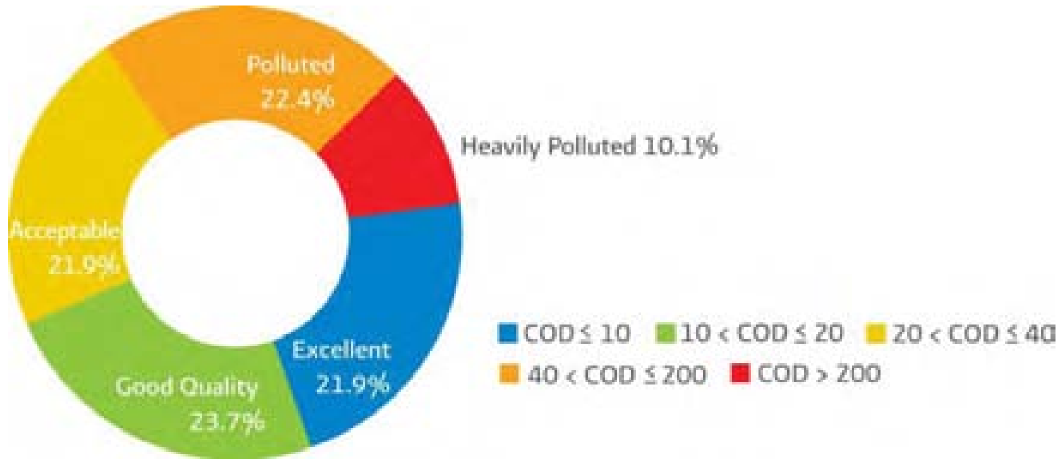
SOURCE: CONAGUA. Deputy Director General's Office for Technical Affairs.

M2.10 Water quality according to COD indicator, in surface water monitoring sites, 2007



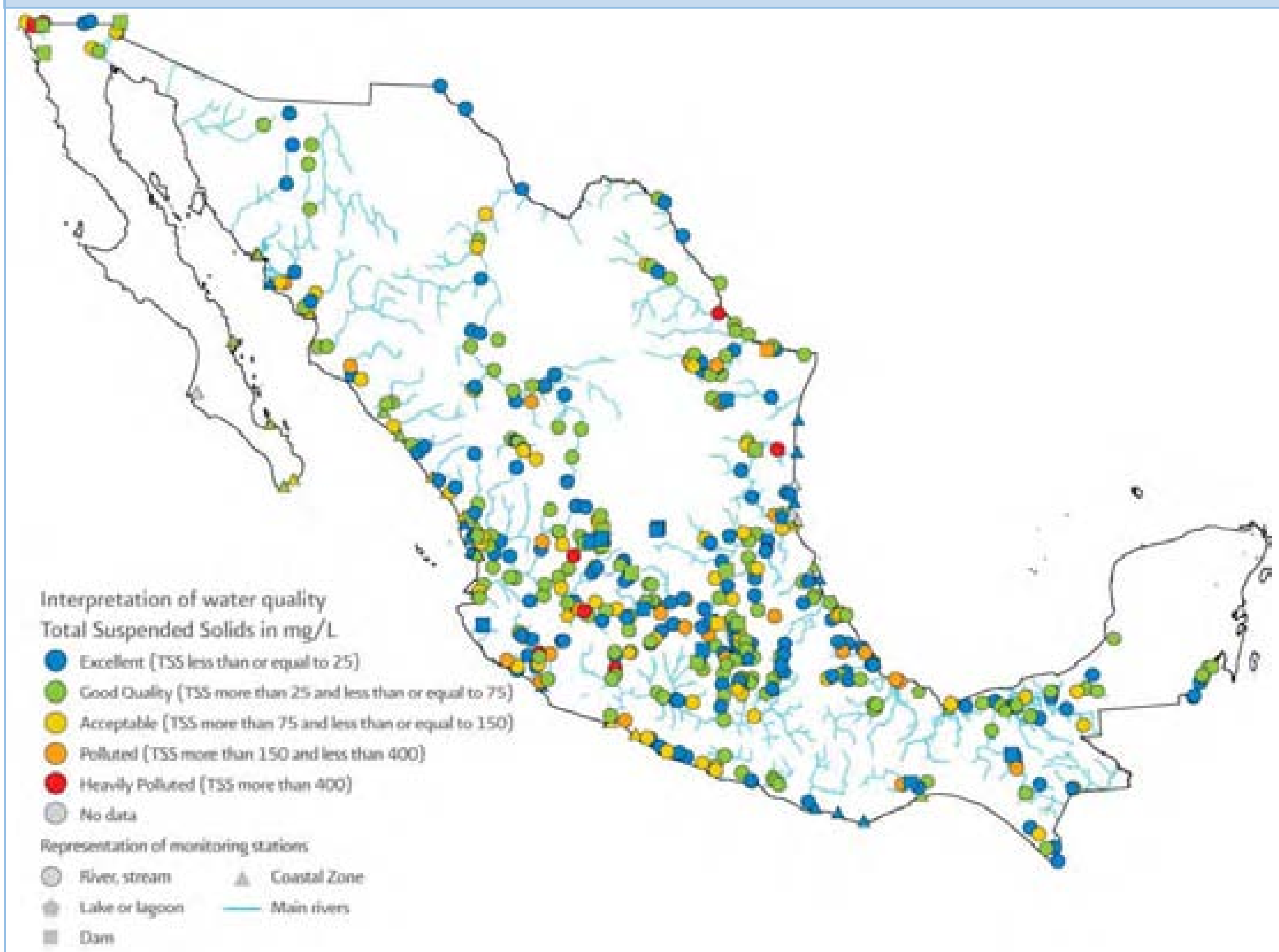
NOTE: Includes water quality monitoring sites in interior surface water bodies (rivers, streams, lakes, lagoons, dams, channels, drains and outlets) and in coastal zones (lagoons, estuaries, marshes and bays).
SOURCE: CONAGUA. Deputy Director General's Office for Technical Affairs.

G2.9 Percentage distribution of surface water quality monitoring sites, by category of COD, 2007



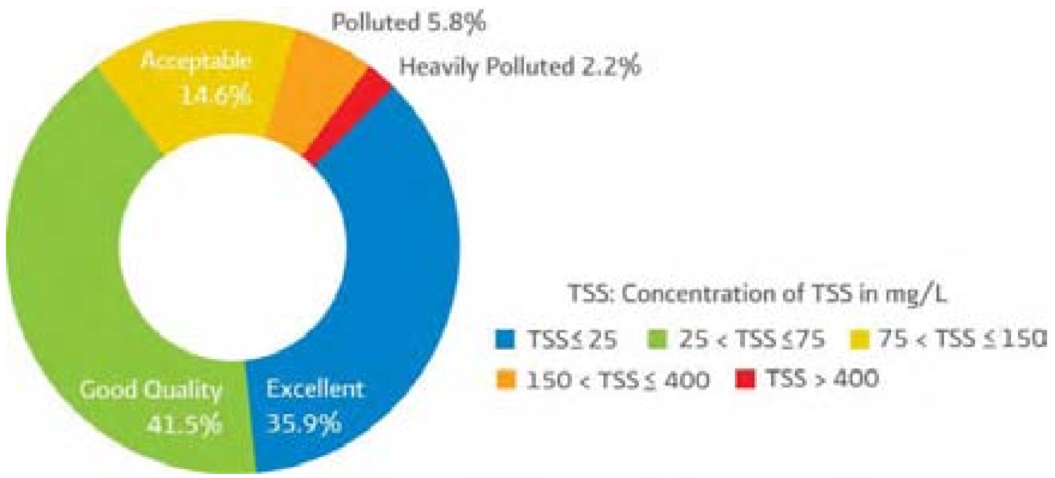
SOURCE: CONAGUA. Deputy Director General's Office for Technical Affairs.

M2.11 Water quality by TSS indicator, in surface water monitoring sites, 2007



NOTE: Includes water quality monitoring sites in interior surface water bodies (rivers, streams, lakes, lagoons, dams, channels, drains and outlets) and in coastal zones (lagoons, estuaries, marshes and bays).
SOURCE: CONAGUA. Deputy Director General's Office for Technical Affairs.

G2.10 Percentage distribution of surface water quality monitoring sites, by category of TSS in Mexico, 2007

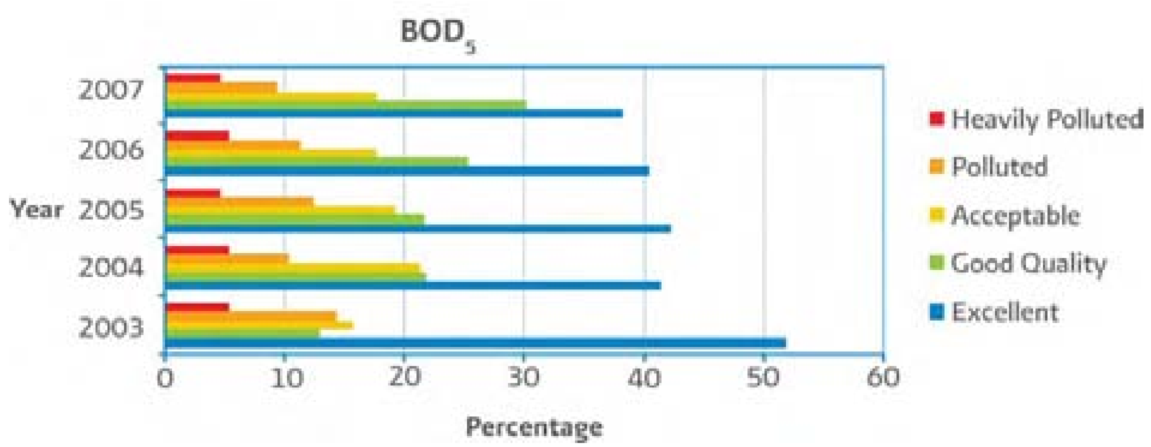


SOURCE: CONAGUA. Deputy Director General's Office for Technical Affairs.

The following graphic shows the trends in water quality as percentages in the period 2003-2007, based on three indicators, BOD_5, COD and TSS.

G2.11 Percentage distribution of water quality monitoring sites, by category of BOD_5, 2003-2007

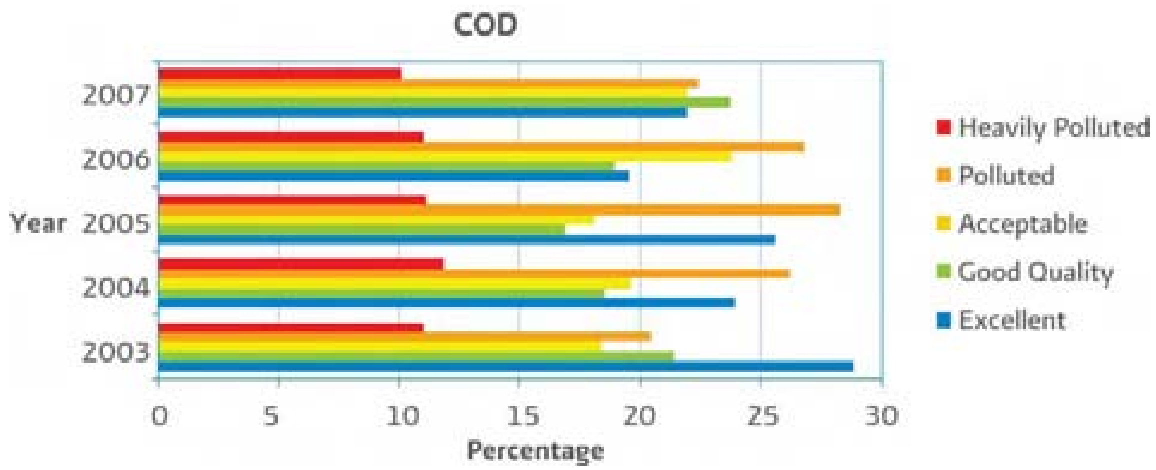
Year	Excellent	Good quality	Acceptable	Polluted	Heavily Polluted
2003	51.8	12.9	15.7	14.3	5.3
2004	41.3	21.8	21.3	10.3	5.3
2005	42.2	21.6	19.2	12.4	4.6
2006	40.4	25.3	17.6	11.3	5.4
2007	38.2	30.2	17.6	9.4	4.6



SOURCE: CONAGUA. Deputy Director General's Office for Planning. Produced based on data from the Deputy Director General's Office for Technical Affairs. Mexico, 2008.

G2.12 Percentage distribution of the water quality monitoring sites, by category of COD, 2003-2007

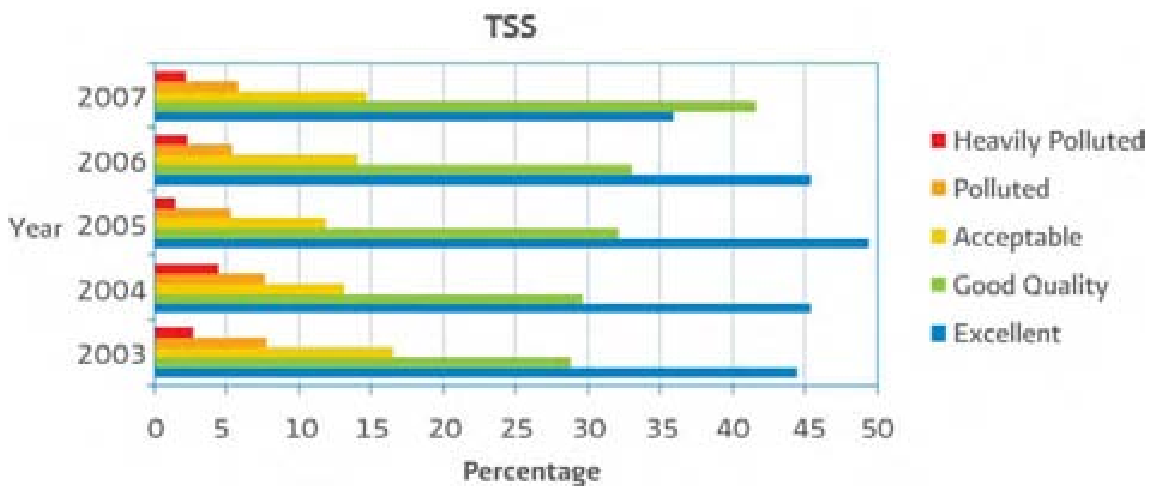
Year	Excellent	Good Quality	Acceptable	Polluted	Heavily Polluted
2003	28.8	21.4	18.4	20.4	11.0
2004	23.9	18.5	19.6	26.2	11.8
2005	25.6	16.9	18.1	28.3	11.1
2006	19.5	18.9	23.8	26.8	11.0
2007	21.9	23.7	21.9	22.4	10.1



SOURCE: CONAGUA. Deputy Director General's Office for Planning. Produced based on data from the Deputy Director General's Office for Technical Affairs. Mexico, 2008.

G2.13 Percentage distribution of the water quality monitoring sites, by category of TSS, 2003-2007

Year	Excellent	Good Quality	Acceptable	Polluted	Heavily Polluted
2003	44.4	28.7	16.5	7.7	2.7
2004	45.3	29.6	13.1	7.6	4.4
2005	49.4	32.0	11.9	5.3	1.4
2006	45.3	33.0	14.0	5.4	2.3
2007	35.9	41.5	14.6	5.8	2.2



SOURCE: CONAGUA. Deputy Director General's Office for Planning. Produced based on data from the Deputy Director General's Office for Technical Affairs. Mexico, 2008.

Groundwater quality

One of the parameters that allows groundwater salinization to be evaluated is the total solids. According to its concentration, groundwater is classified as fresh (< 1,000 mg/L), lightly brackish (1,000-2,000 mg/L), brackish (2,000-10,000 mg/L) and salty (> 10,000 mg/L).

The limit between freshwater and lightly brackish coincides with the maximum concentration indicated by the modification of the Official Mexican Standard NOM-127-SSA1-1994, which "establishes the maximum permissible limits that should be adhered to for water for human consumption and treatment as regards water quality for human consumption".

Water quality on beaches

Through the Clean Beach Program, the sanitation of beaches and the watersheds and aquifers associated with them is promoted. The finality of the program is to prevent and turn back the pollution of Mexico's beaches, respecting the native ecology, making them competitive and thus raising the quality and standard of living of the local population and increasing tourism.

For the development of the program, Beach Committees have been set up in various tourist destinations, which are headed by the President of the municipality in which the beach is found (in chapter 5, you will find a complete list of the Beach Committees set up). Additionally, in order to support the program, an inter-institutional group has been created, whose activities commenced in April 2006, and which is made up of staff from the SEMARNAT, PROFEPA, SEMAR, Sector, COFEPRIS and the CONAGUA.

In order to evaluate water quality on beaches, the values of the enterococcus faecalis indicator are determined. The qualification criteria are the following:

- Apt for recreational use: 0 or less than 500 MLN/100 mL.
- Not apt for recreational use: > 500 MLN/100 mL.

MLN; Most likely number of organisms or *enterococcus faecalis.*

According to the Water Quality Monitoring Program on Beaches carried out by COFEPRIS, between 2003 and 2007, water quality on beaches improved, as shown in the following table:

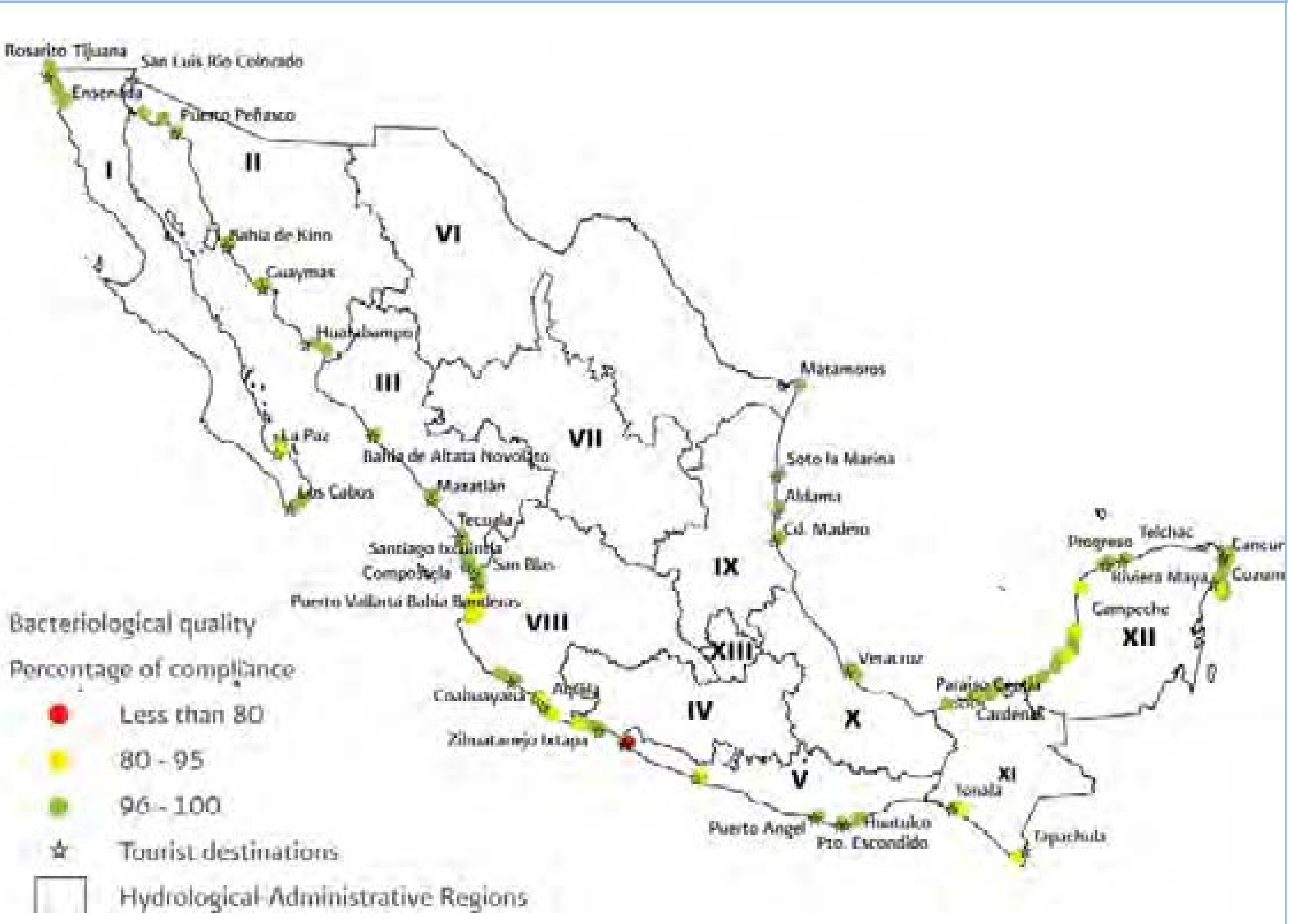
T2.19 Results of the water quality monitoring program on beaches, annual series from 2003 to 2007

Year	2003	2004	2005	2006	2007
Number of tourist destinations	35	37	44	45	46
Number of beaches	226	209	259	274	276
Number of coastal states	17	17	17	17	17
Samples that comply with quality criteria (%)	93.7	94.5	96.5	96.2	98.4

SOURCE: SEMARNAT. CONAGUA. PROFEPA. SEMAR. SECTUR and COFEPRIS. Clean Beach Program, Mexico, 2007.

The following map shows the bacteriological quality on the beaches of tourist destinations in 2007.

M2.12 Bacteriological water quality in the beaches of tourist destinations, 2007



SOURCE: CONAGUA. Deputy Director General's Office for Planning. Produced based on data from SEMARNAT, CONAGUA, PROFEPA, SEMAR, SECTUR and COFREPIS. Clean Beach Program, Mexico, 2008.

Chapter 3

Uses of Water

This chapter presents the various uses of water by Hydrological-Administrative Region and State. For the purpose of this document, the twelve uses of water as defined in the Public Registry of Water Rights (REPDA, its initials in Spanish) have been reduced to five main headings; agricultural, public supply, self-supplying industry, thermoelectric and hydropower. For each use, among other aspects, the volumes allocated are shown, as well as the source of withdrawal, from both surface and groundwater.

It is worth mentioning that the theme of virtual water has been incorporated into the present edition. This theme has been gaining significance in current affairs and may serve as a reference to situate Mexico in the section on water in the world.

Finally, the level of water stress by Hydrological-Administrative Region is shown, by means of which we can observe that almost two thirds of the territory of Mexico is already under high pressure on its water resources.

3.1 Classification of the uses of water

In the Public Registry of Water Deeds (REPDA), the volumes allocated (or assigned) to the users of the nation's water are registered. In this Registry, the uses of water are classified into 12 groups, which for practical purposes have been grouped into five headings; four that correspond to offstream uses, namely agricultural, public supply, self-supplying industry and thermoelectric, as well as hydropower, which is considered separately since it corresponds to an instream use of water.

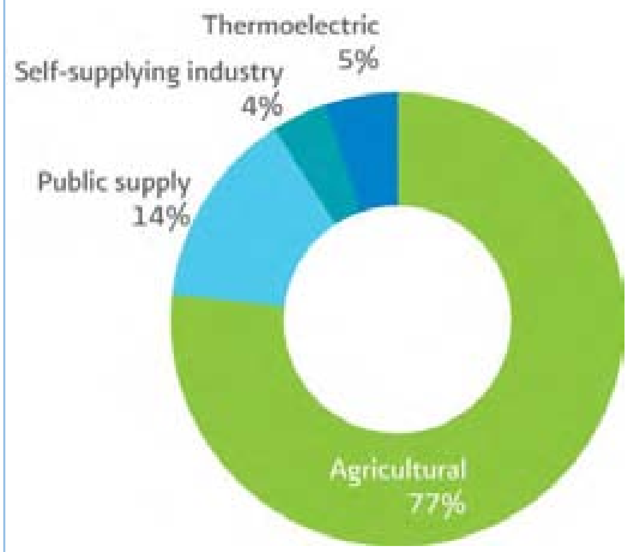
As may be observed in the figure, the greatest volume allocated for offstream uses of water is the one corresponding to agricultural activities, since Mexico is one of the countries with the most substantial irrigation infrastructures in the world.

Distribution in percentages of the volumes allocated for offstream uses, 2007

Of the water used in Mexico for offstream use, 63% comes from surface sources (rivers, streams and lakes), whereas the remaining 37% comes from sources of groundwater (aquifers).

As regards hydropower plants (instream use), 122.8 billion cubic meters of water (km^3) were used in 2007. It should be pointed out that for this use the same water is used and counted several times, in all the country's plants.

G3.1 Distribution of offstream waters uses in Mexico



NOTE: This data comes from the volumes of water declared for the payment of duties for the withdrawal and use of water.
It should be mentioned that the volume registered in the REPDA for the use in hydropower plants was 161.2 km^2 in December 2007.
SOURCE: CONAGUA. Deputy Director General's Office for Water Management.

T3.1 Offstream uses, according to the origin of the source of withdrawal, 2007
(billions of cubic meters, km^3)

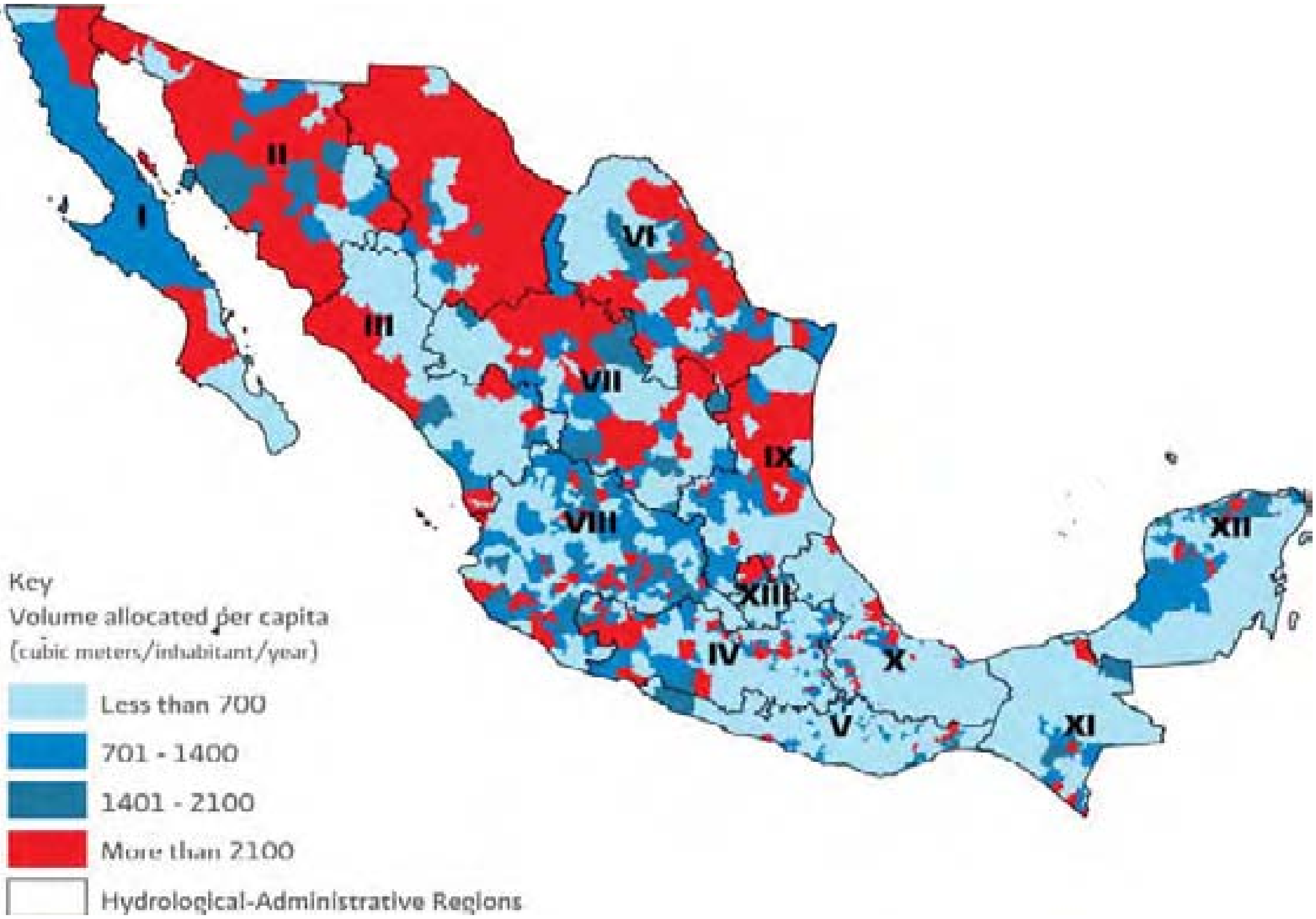
Use	Origin		Total volume
	Surface	Groundwater	
Agricultural[a]	40.5	20.1	60.6
Public supply[b]	4.2	6.9	11.1
Self-supplying industry[c] (excluding thermoelectric)	1.7	1.4	3.1
Thermoelectric[d]	3.6	0.5	4.1
Total	**50.0**	**28.9**	**78.9**

NOTE: 1 km^3 = 1 000 hm^3 = 1 billion m^3.
The data corresponds to volumes allocated on December 31st, 2007.
[a] Includes the agricultural, livestock, aquaculture, multiple and other headings of the REPDA classification, as well as the volumes of water still pending registration (2.05 km^3).
[b] Includes the public urban and domestic headings of the REPDA classification.
[c] Includes the industrial, agro-industrial, service and trade headings of the REPDA classification.
[d] Includes all energy generation plants that are not hydropower plants.
SOURCE: CONAGUA. Deputy Director General's Office for Water Management.

3.2 Distribution of the uses throughout Mexico

The following map shows the volume assigned for offstream uses in 2007, by municipality.

M3.1 Intensity of the offstream uses of water by municipality, 2007



SOURCE: CONAGUA. Deputy Director General's Office for Water Management.

The following figure shows the way in which volumes of water have been allocated for offstream uses in Mexico. It may be observed that the Hydrological-Administrative Regions with the largest allocation of water are: VIII Lerma-Santiago-Pacific, IV Balsas, III Northern Pacific and VI Bravo. It is also worth mentioning that the use for agriculture is more than 80% of the total of all allocations in these regions, with the exception of IV Balsas, where the thermoelectric plant in Petacalco, situated near the mouth of the river Balsas, occupies a significant volume of water.

G3.2 Volumes allocated for offstream uses, by Hydrological-Administrative Region, 2007

NOTE: The regionalization of volumes was carried out based on the location of the use as registered in the REPDA, rather than the place of allocation of the corresponding deeds.
SOURCE: CONAGUA. Deputy Director General's Office for Planning. Produced based on the volumes registered in the REPDA on December 31st, 2007

T3.2 Volumes allocated for offstream uses, by Hydrological-Administrative Region, 2007
(millions of cubic meters, hm^3)

Hydrological-Administrative Region		Total volume Allocated	Agricultural[a]	Public supply[b]	Self-supplying industry excluding thermoelectric[c]	Thermoelectric[d]
I	Baja California Peninsula	3 503.9	2 889.3	327.4	88.2	199.0
II	Northwest	7 572.8	6 517.1	976.7	79.0	0.0
III	Northern Pacific	10 376.5	9 674.5	640.9	61.1	0.0
IV	Balsas	10 778.1	6 324.3	1 014.3	269.3	3 170.2
V	Southern Pacific	1 343.2	990.6	331.7	20.9	0.0
VI	Rio Bravo	9 191.3	7 690.4	1 182.2	203.4	115.3
VII	Central Basins of the North	3 834.3	3 367.6	370.1	58.3	38.3
VIII	Lerma-Santiago-Pacific	13 872.9	11 443.7	2 002.4	402.3	24.5
IX	Northern Gulf	4 681.4	3 630.5	524.7	460.6	65.6
X	Central Gulf	4 867.3	2 872.8	742.9	877.3	374.3
XI	Southern Border	2 128.7	1 588.1	446.0	94.6	0.0
XII	Yucatan Peninsula	2 133.7	1 343.4	461.1	319.8	9.4
XIII	Waters of the Valley of Mexico	4 665.4	2 239.6	2 137.6	198.6	89.6
Total		**78 949.5**	**60 571.9**	**11 158.0**	**3 133.4**	**4 086.2**

NOTES: The sums may not add up precisely to the total, due to the rounding up or down of figures.
The regionalization of volumes was carried out based on the location of the use as registered in the REPDA, rather than the place of allocation of the corresponding deeds.
[a] Includes the agricultural, livestock, aquaculture, multiple and other headings of the REPDA classification.
[b] Includes the public urban and domestic headings of the REPDA classification.
[c] Includes the industrial, agro-industrial, service and trade headings of the REPDA classification.
[d] Includes the total volume allocated for the generation of electricity, not including hydropower.
SOURCE: CONAGUA. Deputy Director General's Office for Planning. Produced based on the volumes registered in the REPDA on December 31st, 2007.

The following figure shows the information on the volumes of water allocated by State, among which Sinaloa and Sonora stand out, for their extensive areas under irrigation.

G3.3 Volume allocated for offstream uses, by State, 2007
(millions of cubic meters, hm³)

NOTE: The volumes are up to December 31st, 2007.
SOURCE: CONAGUA. Deputy Director General's Office for Planning.
Produced based on data from the Deputy Director General's Office for Water Management.

T3.3 Volumes allocated for offstream uses, by State, 2007
(millions of cubic meters, hm³)

	State	Total volume allocated	Agriculture[a]	Public supply[b]	Self-supplying industry excluding thermoelectric[c]	Thermoelectric[d]
1	Aguascalientes	625.3	495.0	118.9	11.4	0.0
2	Baja California	3 104.6	2 563.7	265.9	79.9	195.1
3	Baja California Sur	399.3	325.7	61.5	8.2	3.9
4	Campeche	619.0	476.8	125.4	16.8	0.0
5	Coahuila de Zaragoza	1 940.0	1 606.3	185.3	73.5	74.9
6	Colima	1 650.7	1 561.0	61.5	24.4	3.8
7	Chiapas	1 676.7	1 385.9	261.4	29.4	0.0
8	Chihuahua	5 148.4	4 593.0	476.1	51.7	27.6
9	Federal District	1 122.5	1.2	1 089.8	31.5	0.0
10	Durango	1 558.8	1 375.1	153.4	18.8	11.5
11	Guanajuato	4 059.2	3 395.6	587.1	56.0	20.5
12	Guerrero	4 259.6	838.0	287.0	12.5	3 122.1
13	Hidalgo	2 336.7	2 019.7	168.0	66.4	82.6
14	Jalisco	3 663.5	2 815.0	717.7	130.7	0.1
15	State of Mexico	2 741.7	1 250.0	1 338.4	156.4	6.9
16	Michoacan de Ocampo	5 068.9	4 606.6	271.9	142.2	48.2
17	Morelos	1 233.6	916.1	258.5	59.0	0.0
18	Nayarit	1 186.6	1 025.9	105.0	55.7	0.0
19	Nuevo Leon	2 017.7	1 421.7	511.7	79.9	4.4
20	Oaxaca	1 087.7	847.7	200.8	39.1	0.0
21	Puebla	2 491.9	1 989.0	382.8	113.6	6.5
22	Queretaro Arteaga	1 019.0	660.3	291.7	61.3	5.7
23	Quintana Roo	459.8	93.0	91.1	275.7	0.0
24	San Luis Potosi	1 333.3	1 092.3	170.8	29.2	41.0
25	Sinaloa	9 164.3	8 608.3	509.6	46.4	0.0
26	Sonora	7 394.2	6 361.6	954.6	78.0	0.0
27	Tabasco	395.2	153.5	182.8	58.9	0.0
28	Tamaulipas	3 775.6	3 300.2	317.7	103.7	54.0
29	Tlaxcala	283.8	178.9	85.5	19.4	0.0
30	Veracruz de Ignacio de la Llave	4 591.7	2 504.7	568.5	1 150.6	367.9
31	Yucatan	1 102.7	814.5	245.1	33.6	9.5
32	Zacatecas	1 427.5	1 295.5	112.5	19.5	0.0
Total		**78 949.5**	**60 571.9**	**11 158.0**	**3 133.4**	**4 086.2**

NOTES: The sums may not add up precisely to the total, due to the rounding up or down of figures.
The volumes are up to December 31st, 2007.
Due to the rounding up and down of the figure, the national total may also differ from the sum of the values by State.
[a] Includes the agricultural, livestock, aquaculture, multiple and other headings of the REPDA classification.
[b] Includes the public urban and domestic headings of the REPDA classification.
[c] Includes the industrial, agro-industrial, service and trade headings of the REPDA classification.
[d] Includes the total volume allocated for the generation of electricity excluding hydropower.
SOURCE: CONAGUA. Deputy Director General's Office for Water Management.

3.3 Agricultural use

The main use of water in Mexico is for agriculture, which mainly refers to the water used for the irrigation of crops. The area assigned to agricultural work in Mexico varies between 20 and 25 million hectares, with a harvested area of between 18 and 22 million hectares per year. The value of the direct production is

the equivalent of 6.5% of the nation's Gross Domestic Product. Furthermore, the population occupied under this heading varies between 4 and 5 million individuals, and it is estimated that around 25 million Mexicans depend directly on this activity, the majority of them among the rural population.

Mexico is in sixth place worldwide in terms of the area with irrigation infrastructure, with 6.46 million hectares. 54% of the surface under irrigation corresponds to 85 Irrigation Districts and the remaining 46% to more than 39 000 Irrigation Units.

3.4 Use for public water supply

The use for public supply includes all water delivered through the drinking water networks, which supplies domestic (home) users, as well as the various industries and services connected to these networks.

According to the Censuses of Capture, Treatment and Water Supply carried out by INEGI on the country's water utilities, it was calculated that in 2003, 82% of the water supplied by the drinking water networks was for domestic use and the remaining 18% for industries and services. Additionally, comparing the data from the 1998 Census with the 2003 version, it may be observed that in this five-year period the volume of water used by water utilities increased by 22%. Another relevant fact is that in 2003, the percentage of water billed compared to the total of water used by water utilities was 49%, which indicates that the remaining 51% of this volume was lost in leaks, was used illegally or corresponds to deficiencies in the roster of users.

3.5 Use in self-supplying industry

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

The main industrial uses are those that correspond to the chemical industry and the production of sugar, petroleum, cellulose and paper

3.6 Use in thermoelectric plants

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

In 2007, thermoelectric plants generated 198.79 TWh, which represented 87.0% of the total of electricity produced in the country. The corresponding plants have an installed capacity of 38 799 MW, or 77.8% of the country's total.

It should be noted that 76% of the water assigned to thermoelectric plants in Mexico corresponds to the coal-electric plant in Petacalco, situated on the Guerrero coast, very close to the mouth of the river Balsas.

T3.4 Generation of thermoelectricity and the capacity installed, annual series from 1999 to 2007

Parameter / Year	1999	2000	2001	2002	2003	2004	2005	2006	2007
Generation of thermoelectricity (TWh)	147.07	157.39	167.11	174.60	181.95	181.24	188.78	191.78	198.79
Total generation of electricity (TWh)	179.07	190.00	194.92	198.88	200.94	205.39	215.63	221.00	228.49
Thermoelectric capacity installed (MW)	25 449	25 995	28 312	30 971	34 348	35 423	35 306	37 572	38 799
Total capacity installed (MW)	34 839	35 385	37 691	40 350	43 727	45 687	45 576	47 857	49 854

NOTE: 1 TWh = 1000 GWh
SOURCE: Federal Commission for Electricity. www.cfe.gob.mx/es/LaEmpresa/igenerationelectricity

3.7 Use in hydropower plants

The uses described up to now are known as off-stream uses, since water is diverted from a source to carry out a specific activity according to the type of use. On the other hand, the generation of hydropower is an instream use, since the water used is taken directly from the source. Nationwide, the two Hydrological-Administrative Regions with the largest allocation of water for this use are XI Southern Border and IV Balsas, since in these regions the rivers with the heaviest flow and as a result the country's largest hydropower plants are located. It should be noted that the region XII Yucatan Peninsula does not have a hydropower plant.

T3.5 Volumes declared for the payment of duties for the use of water in hydropower plants, by Hydrological-Administrative Region, annual series from 1999 to 2007
(millions of cubic meters, hm³)

Hydrological-Administrative Region		Volume of water declared								
		1999	2000	2001	2002	2003	2004	2005	2006	2007
I	Baja California Peninsula	0	0	0	0	0	0	0	0	0
II	Northwest	2 758	3 369	2 740	2 613	1 987	1 014	3 251	2 929	3 351
III	Northern Pacific	7 950	8 309	9 479	5 859	5 168	7 284	11 598	10 747	11 184
IV	Balsas	41 524	32 596	25 992	45 588	30 969	35 207	32 141	21 820	31 099
V	Southern Pacific	2 075	2 104	1 891	1 705	1 925	2 049	1 890	1 949	2 140
VI	Rio Bravo	2 503	2 867	2 067	1 550	1 110	462	2 074	2 263	2 890
VII	Central Basins of the North	0	0	0	0	0	0	0	0	0
VIII	Lerma-Santiago-Pacific	13 468	6 122	4 126	5 572	7 792	10 418	7 361	4 658	10 517
IX	Northern Gulf	1 230	1 230	1 180	989	997	1 598	1 488	810	1 105
X	Central Gulf	19 407	16 844	15 510	12 602	12 108	16 043	13 978	17 835	14 279
XI	Southern Border	62 322	92 365	65 821	44 454	34 056	36 454	41 573	77 246	46 257
XII	Yucatan Peninsula	0	0	0	0	0	0	0	0	0
XIII	Waters of the Valley of Mexico	33	38	42	50	52	54	31	39	11
Total		**153 269**	**165 844**	**128 848**	**120 982**	**96 164**	**110 581**	**115 386**	**140 295**	**122 832**

NOTE: The sums may not add up precisely to the total, due to the rounding up or down of figures.
SOURCE: CONAGUA. Deputy Director General's Office for Water Management.

In 2007, the country's hydropower plants employed a volume of 122.8 billion cubic meters of water, which allowed 29.70 TWh of electricity to be generated, or 13.0% of the total generated in Mexico. The installed capacity in the hydropower plants is 11 055 MW, which corresponds to 22.2% of the total installed in the country.

T3.6 Generation of hydropower and installed capacity, annual series from 1999 to 2007

Parameter / Year	1999	2000	2001	2002	2003	2004	2005	2006	2007
Generation of hydropower (TWh)	32.01	32.61	27.81	24.28	18.99	24.16	26.85	29.22	29.70
Total generation of electricity (TWh)	179.07	190.00	194.92	198.88	200.94	205.39	215.63	221.00	228.49
Hydropower capacity installed (MW)	9 390	9 390	9 379	9 379	9 379	10 264	10 270	10 285	11 055
Total capacity installed (MW)	34 839	35 385	37 691	40 350	43 727	45 687	45 576	47 857	49 854

NOTE: 1 TWh = 1000 GWh
SOURCE: Federal Commission for Electricity. www.cfe.gob.mx/es/LaEmpresa/generacionelectricity

3.8 Water stress

The percentage of water used for offstream uses as compared to the total availability is an indicator of the water stress in any given country, catchment or region. It is considered that if the percentage is greater than 40%, there is strong water stress.

On the whole, Mexico is experiencing 17% water stress, which is considered moderate; however, the central, northern and northwest area of the country is experiencing 47% water stress, which is considered as a strong degree of stress. In the following table, this indicator is shown for each of the country's Hydrological-Administrative Regions.

T3.7 Water stress, by Hydrological-Administrative Region, 2007

Hydrological-Administrative Region		Total volume of water allocated (hm³)	Mean natural availability (hm³)	Water stress (%)	Classification of the degree of stress
I	Baja California Peninsula	3 503.9	4 616	75.91	High
II	Northwest	7 572.8	8 204	92.30	High
III	Northern Pacific	10 376.5	25 627	40.49	High
IV	Balsas	10 778.1	21 657	49.77	High
V	Southern Pacific	1 343.2	32 794	4.10	Low
VI	Rio Bravo	9 191.3	12 024	76.44	High
VII	Central Basins of the North	3 834.3	7 780	49.28	High
VIII	Lerma-Santiago-Pacific	13 872.9	34 037	40.76	High

(continues)

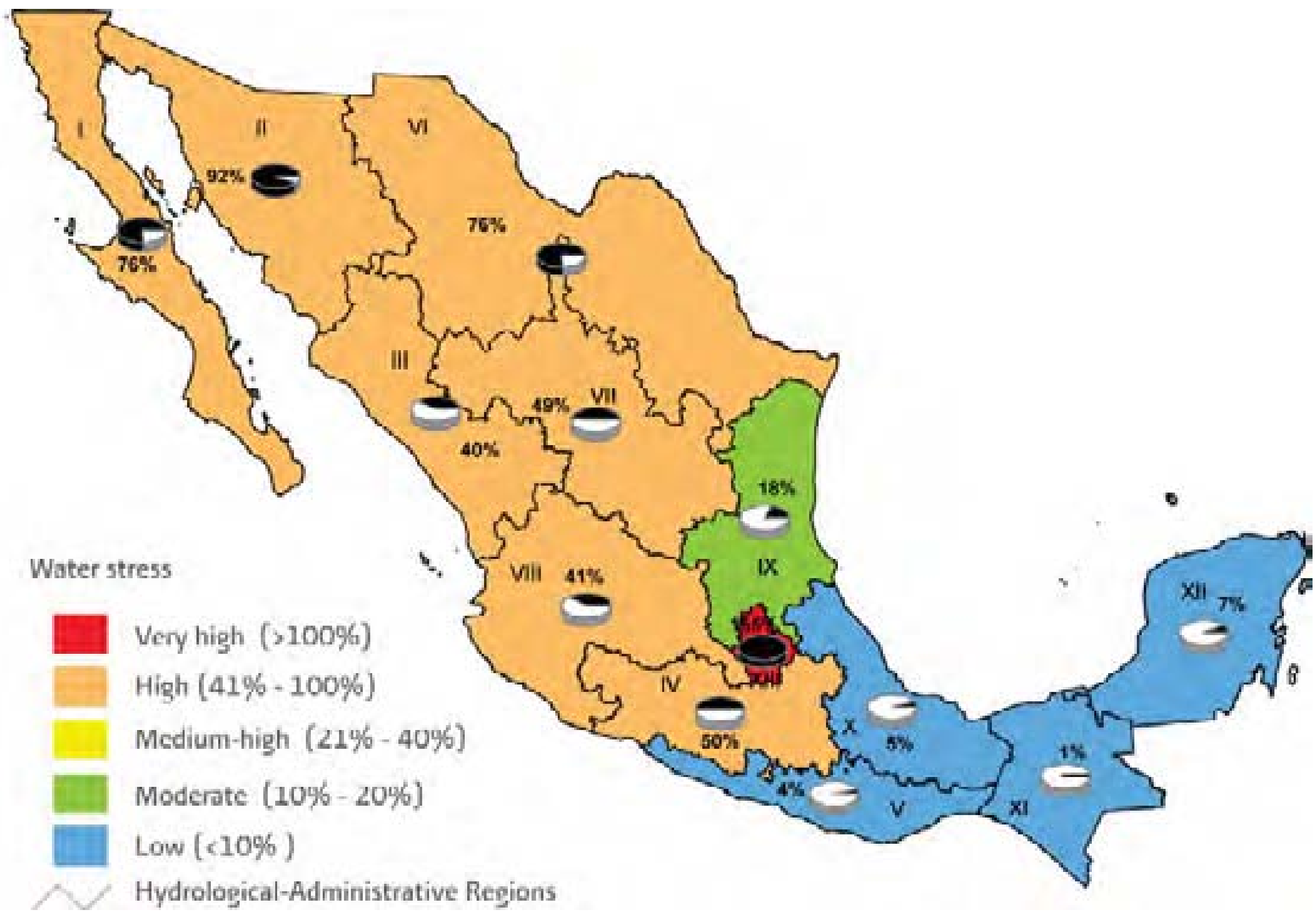
(continued)

T3.7 Water stress, by Hydrological-Administrative Region, 2007

Hydrological-Administrative Region	Total volume of water allocated (hm³)	Mean natural availability (hm³)	Water stress (%)	Classification of the degree of stress
IX Northern Gulf	4 681.4	25 500	18.36	Moderate
X Central Gulf	4 867.3	95 455	5.10	Low
XI Southern Border	2 128.7	157 754	1.35	Low
XII Yucatan Peninsula	2 133.7	29 645	7.20	Low
XIII Waters of the Valley of Mexico	4 665.4	3 008	155.00	High
Total	**78 949.5**	**458 100**	**17.23**	**Moderate**

NOTES: The sums may not add up precisely to the total, due to the rounding up or down of figures.
Water stress = 100* (Total volume of water allocated / Mean natural availability of water).
SOURCE: CONAGUA. Deputy Director General's Office for Planning. Produced based on:
CONAGUA. Deputy Director General's Office for Water Management.
CONAGUA. Deputy Director General's Office for Technical Affairs.

M3.2 Water stress by Hydrological-Administrative Region, 2007



SOURCE: CONAGUA. Deputy Director General's Office for Planning. Produced based on:
CONAGUA. Deputy Director General's Office for Technical Affairs.
CONAGUA. Deputy Director General's Office for Water Management.

3.9 Virtual water in Mexico

Virtual water is defined as the total quantity of water used by or embedded in a product, good or service. For example, in order to produce one kilogram of wheat in Mexico, on average 1 000 liters of water is required, whereas to put a kilogram of beef on somebody's table requires 13 500 liters. These values vary between countries.

Through Mexico's commercial exchanges with other countries, in 2007 Mexico exported 5 936 million cubic meters of virtual water, and imported 33 977, meaning that it had a net import of 28 041 million cubic meters of virtual water. Of this quantity, 57% is related with agricultural products, 36% with animal products and the remaining 7% with industrial products.

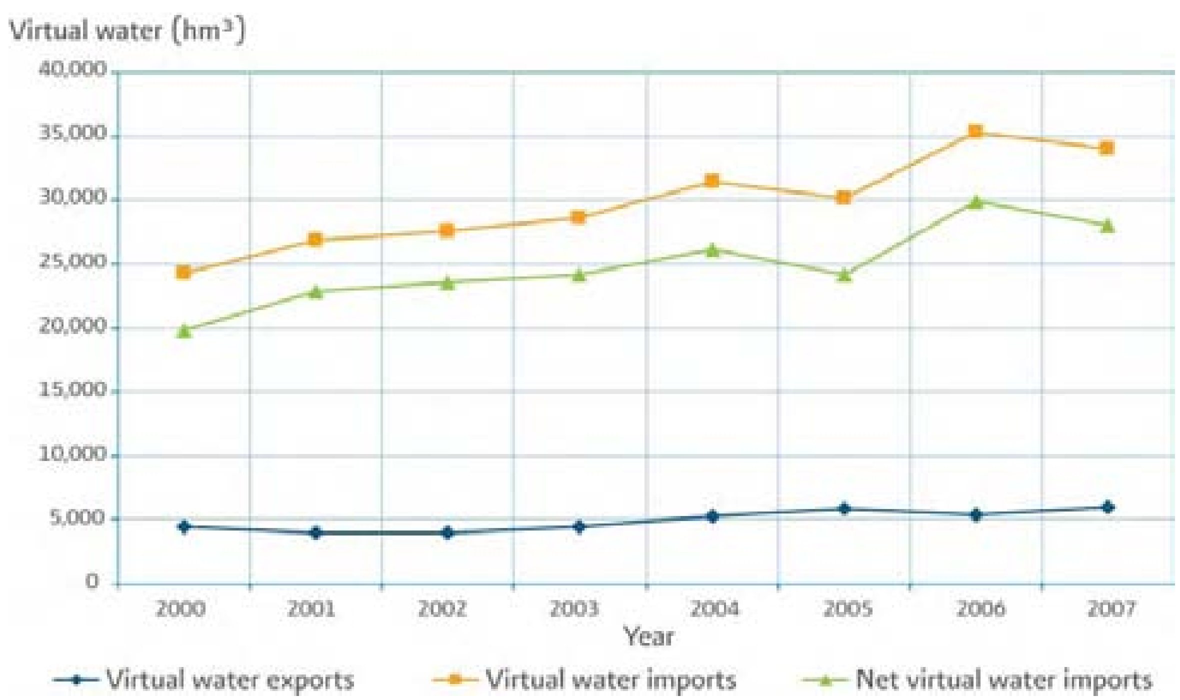
The three products that consume the most virtual water that were exported in 2007 were edible fruit with 1 042 million cubic meters, meats and edible remains with 767 million cubic meters and different types of vegetables with 740 million cubic meters. The industrial products which export the most virtual water were the iron and steel industry with 656 million cubic meters and the petrol industry with 155 million cubic meters.

On the other hand, the three products with which the most virtual water was imported were cereals, with 11 367 million cubic meters, meats and edible remains with 10 046 million cubic meters and grains and fruit with 6 815 million cubic meters. As regards industry, the greatest imports were obtained in the field of iron and steel, with 908 hm^3 and organic chemical products with 357 hm^3.

Evolution of imports and exports

The following figure presents the annual evolution of virtual water imports and exports in the period from 2000 to 2007.

G3.4 Virtual water imports and exports in Mexico 2000-2007

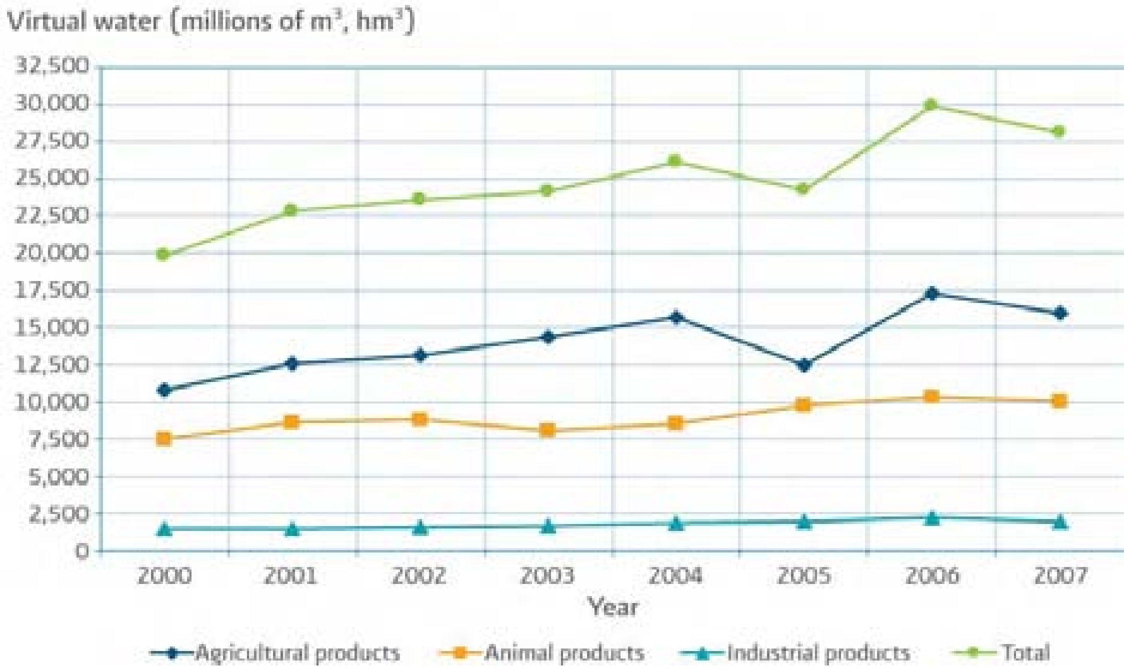


SOURCE: CONAGUA, Deputy Director General's Office for Technical Affairs.

The behavior of the net virtual water imports (the imports minus the exports) for agricultural products, animals and industry, mark an increase in recent years. The growth in the net virtual water import through agricultural products is noteworthy.

Between 2000 and 2007, Mexico's virtual water exports increased by 33% with a maximum in 2007, whereas the imports grew by 40%, which a maximum in 2006. The net virtual water imports grew 41% in this period.

G3.5 Net virtual water imports from 2000 to 2007



SOURCE: CONAGUA, Deputy Director General's Office for Technical Affairs.

T3.8 Net virtual water imports in Mexico from 2000 to 2007
(millions of cubic meters per year)

Concept/Year	2000	2001	2002	2003	2004	2005	2006	2007
Virtual water export	4 461	40 045	4 022	4 488	5 251	5 884	5 396	5 936
Virtual water import	24 304	26 864	27 596	28 617	31 405	30 097	35 255	33 977
Net import of virtual water (difference)	**19 843**	**22 819**	**23 575**	**24 129**	**26 154**	**24 213**	**29 859**	**28 041**

SOURCE: CONAGUA, Deputy Director General's Office for Technical Affairs.

Chapter 4

Hydraulic Infrastructure

Mexico is a country with a great hydraulic tradition, with the construction of large hydraulic infrastructure being a constant from the beginning of the National Irrigation Commission to nowadays.

As a part of this strategic infrastructure of national security, and in order to make appropriate use of the nation's water, this chapter focuses on its large storage dams, aqueducts, treatment plants and wastewater treatment plants. It is worth mentioning that one of the goals of the current administration is to increase the coverage of wastewater treatment, which explains why a significant increase in the construction of this type of infrastructure may be noted. On the other hand, as regards reuse, this chapter shows the reuse of both municipal and non-municipal water.

Due to the importance of irrigation in Mexico, a section of this chapter focuses on this subject, as well as on the evolution in drinking water and sanitation coverage.

4.1 Mexico's Hydraulic Infrastructure

Among the hydraulic infrastructure available within the country to provide the water required for the various national users, the following stands out:

4 000 storage dams.

6.46 million hectares with irrigation.

2.74 million hectares with technified rainfed infrastructure.

541 drinking water treatment plants in operation.

1 710 municipal wastewater treatment plants in operation.

2 021 industrial wastewater treatment plants in operation.

3 000 km of aqueducts.

4.2 Mexico's Main Dams

There are approximately 4 000 dams in Mexico, of which 667 are classified as large dams, according to the definition of the International Commission on Large Dams (ICOLD).

The storage capacity of the country's dams is 150 billion cubic meters. The volume stored in these dams, in the period from 1990 to 2007, is shown in the following figures, both nationally and regionally. This volume depends on the precipitation and runoff in the various regions of the country.

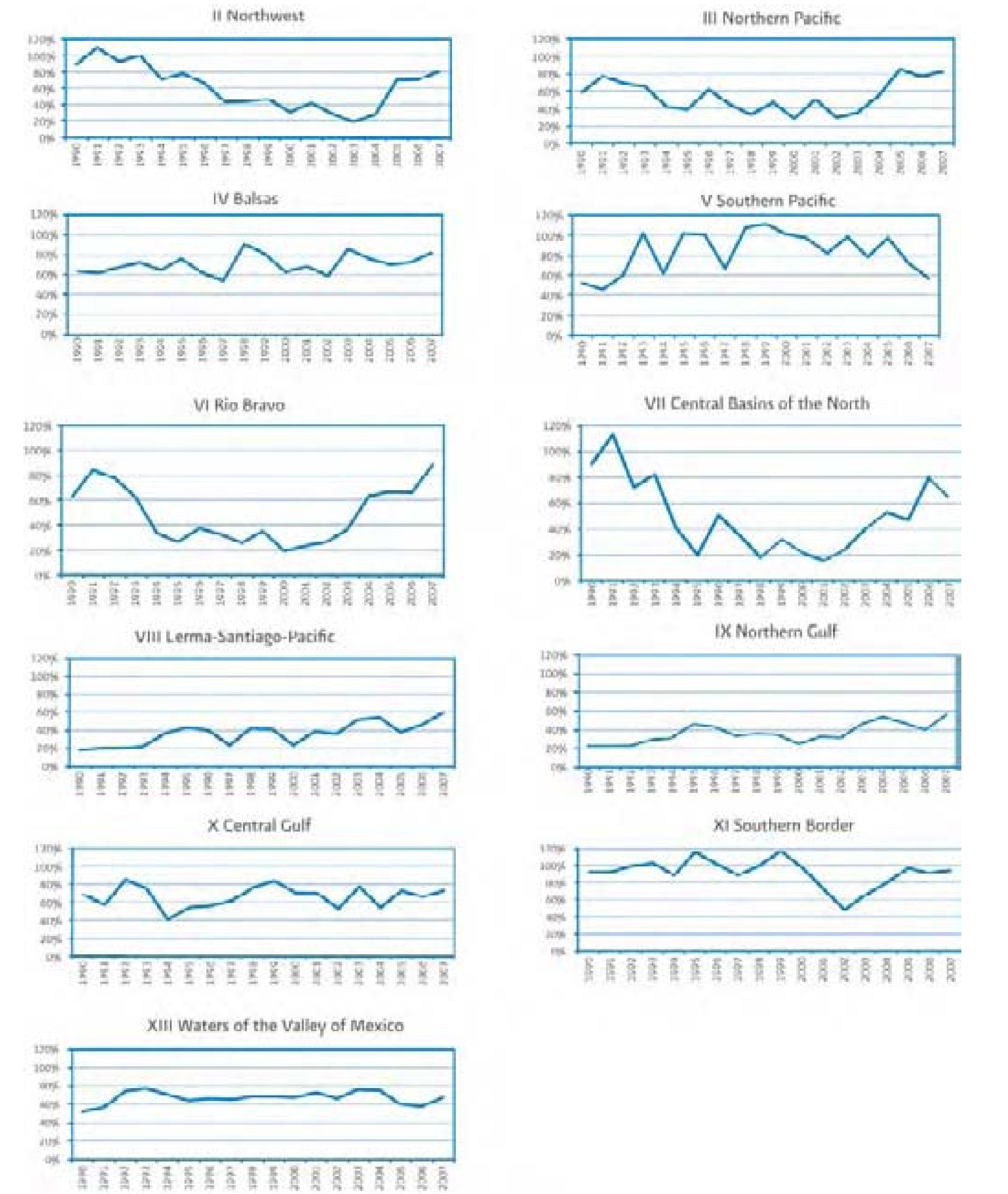
G4.1 Volume stored in Mexico's main dams, annual series from 1990 to 2007
(millions of cubic meters)

1 hm^3 = 1 million cubic meters

NOTE: Volume stored until October 1st every year.

SOURCE: CONAGUA. Deputy Director General's Office for Planning. Produced based on data from the Deputy Director General's Office for Technical Affairs.

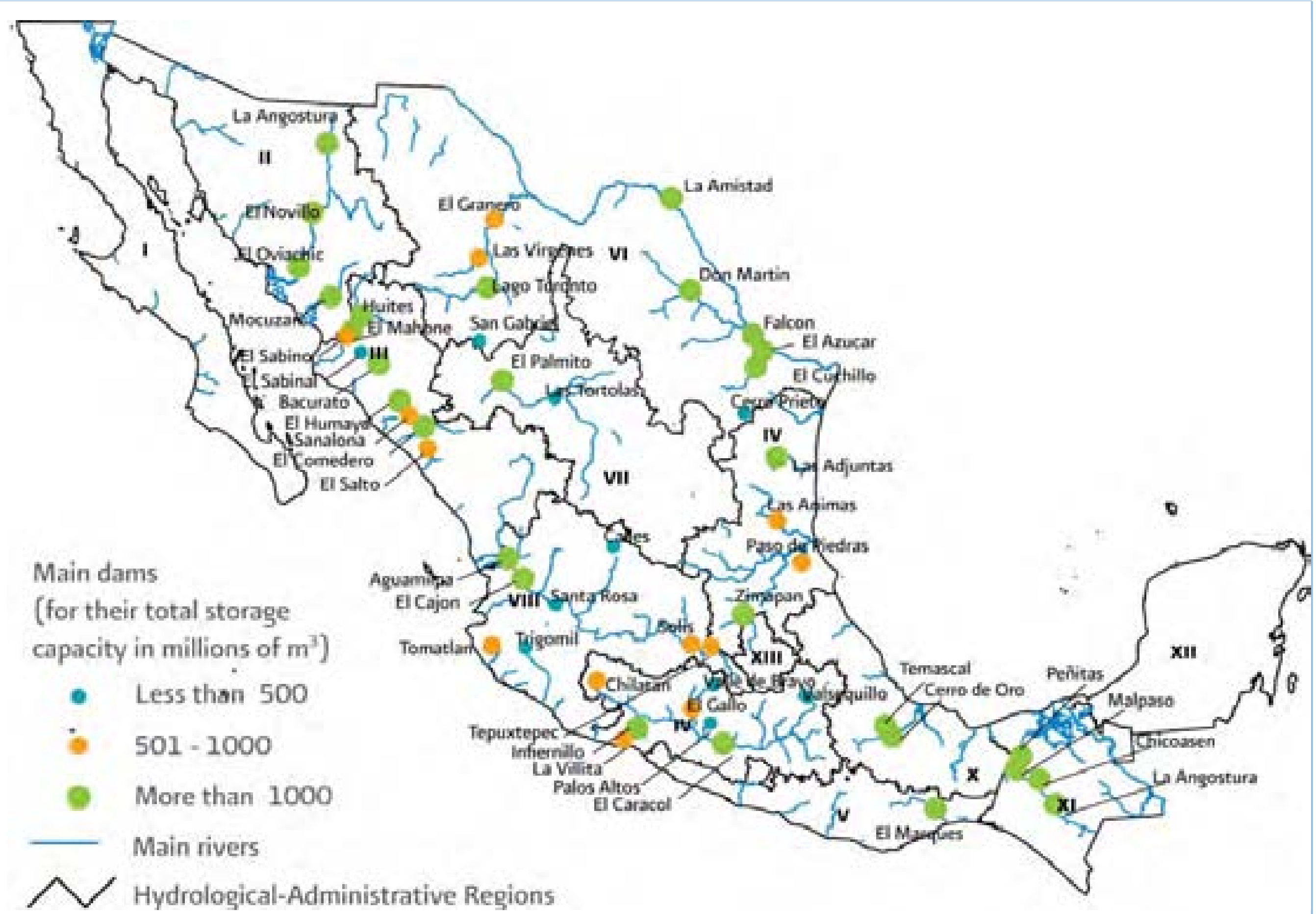
G4.2 Storage percentage by Hydrological-Administrative Region in Mexico's main dams, annual series from 1990 to 2007



NOTE: In the regions I and XII, there are no dams which, for their storage capacity, are included in the list of the country's main dams.
Useful volume stored on October 1st of each year, as regards the capacity at the normal pool elevation.
As a result, the values may be higher than 100%.
SOURCE: CONAGUA. Deputy Director General's Office for Planning. Produced based on data from the Deputy Director General's Office for Technical Affairs.

The country's 52 dams with the greatest storage capacity represent almost 70% of the country's total storage capacity. Their location is shown in the following figure:

M4.1 Main dams in Mexico for their storage capacity, 2007



SOURCE: CONAGUA. Deputy Director General's Office for Planning. Produced based on data from the Deputy Director General's Office for Technical Affairs.

T4.1 Storage capacity and use of Mexico's main dams, 2007

No.	Official name	Common name	Total capacity[a] (hm^3)	Height of the curtain (m)	Year of completion	Hydrological-Administrative Region	State	Uses	Effective capacity (MW)
1	Belisario Dominguez	La Angostura	10 727	143	1974	Southern Border	Chiapas	G	900
2	Netzahualcoyotl	Malpaso	9 605	138	1964	Southern Border	Chiapas	G	1 080
3	Infiernillo	Infiernillo	9 340	149	1963	Balsas	Guerrero – Michoacan	G, C	1 000
4	Presidente Miguel Aleman	Temascal	8 119	76	1955	Central Gulf	Oaxaca	G, C	354
5	Solidaridad	Aguamilpa	5 540	186	1993	Lerma-Santiago-Pacific	Nayarit	G, I	960
6	General Vicente Guerrero	Las Adjuntas	3 900	60	1971	Norther Gulf	Tamaulipas	I, A	
7	Internacional La Amistad	La Amistad	3 887	77	1969	Rio Bravo	Coahuila – Texas	G, I, A, C	66
8	Internacional Falcon	Falcon	3 273	50	1953	Rio Bravo	Tamaulipas – Texas	A, C, G	32
9	Adolfo Lopez Mateos	El Humaya	3 087	106	1964	Northern Pacific	Sinaloa	G, I	90
10	Alvaro Obregon	El Oviachic	2 989	90	1952	Northwest	Sonora	G, I	19
11	Plutarco Elias Calles	El Novillo	2 925	139	1964	Northwest	Sonora	G, I	135
12	Miguel Hidalgo y Costilla	El Mahone	2 921	81	1956	Northern Pacific	Sinaloa	G, I	60
13	Luis Donaldo Colosio	Huites	2 908	165	1995	Northern Pacific	Sinaloa	G, I	422
14	La Boquilla	Lago Toronto	2 903	80	1916	Rio Bravo	Chihuahua	G, I	25
15	Lazaro Cardenas	El Palmito	2 873	105	1946	Central Basins of the North	Durango	I, C	
16	Leonardo Rodriguez Alcaine	El Cajon	2 282	186	2006	Lerma-Santiago-Pacific	Nayarit	G	750
17	Jose Lopez Portillo	El Comedero	2 250	134	1983	Northern Pacific	Sinaloa	G, I	100
18	Gustavo Diaz Ordaz	Bacurato	1 860	116	1981	Northern Pacific	Sinaloa	G, I	92
19	Carlos Ramirez Ulloa	El Caracol	1 414	126	1986	Balsas	Guerrero	G	600
20	Manuel Moreno Torres	Chicoasen	1 376	261	1980	Southern Border	Chiapas	G	2 400
21	Ing. Fernando Hiriart	Zimapan	1 360	203	996	Northern Gulf	Hidalgo -Querétaro	G	292
22	Venustiano Carranza	Don Martin	1 313	35	1930	Rio Bravo	Coahuila de Zaragoza	I, A, C	
23	Miguel de la Madrid	Cerro de Oro	1 250	70	1988	Central Gulf	Oaxaca	G, I	360
24	Cuchillo-Solidaridad	El Cuchillo	1 123	44	1994	Rio Bravo	Nuevo Leon	A,I	
25	Angel Albino Corzo	Peñitas	1 091	58	1986	Southern Border	Chiapas	G	420
26	Adolfo Ruiz Cortines	Mocuzari	950	62	1955	Northwest	Sonora	G, I	10
27	Benito Juarez	El Marques	947	86	1961	Southern Pacific	Oaxaca	I	
28	Marte R. Gomez	El Azucar	824	49	1946	Rio Bravo	Tamaulipas	I	
29	Solis	Solis	728	52	1980	Lerma-Santiago-Pacific	Guanajuato	I	

(continues)

(continued)

T4.1 Storage capacity and use of Mexico's main dams, 2007

No.	Official name	Common name	Total capacity[a] (hm^3)	Height of the curtain (m)	Year of completion	Hydrological-Administrative Region	State	Uses	Effective capacity (MW)
30	Lazaro Cardenas	La Angostura	703	73	1942	Northwest	Durango	I, C	
31	Sanalona	Sanalona	673	81	1948	Northern Pacific	Sinaloa	G, I	14
32	Constitucion de Apatzingan	Chilatan	601	105	1989	Balsas	Jalisco	I	
33	Estudiante Ramiro Caballero	Las Animas	571	31	1976	Northern Gulf	Tamaulipas	I	
34	Jose Maria Morelos	La Villita	541	73	1968	Balsas	Michoacan – Guerrero	G, I	280
35	Josefa Ortiz de Dominguez	El Sabino	514	44	1967	Northern Pacific	Sinaloa	I	
36	Cajon de Peña	Tomatlan	467	68	1976	Lerma-Santiago-Pacific	Jalisco	I	
37	Chicayan	Paso de Piedras	457	30	1976	Northern Gulf	Veracruz de Ignacio de la Llave	I	
38	El Gallo	El Gallo	441	30	1991	Balsas	Guerrero	G	60
39	Tepuxtepec	Tepuxtepec	425	43	1972	Lerma-Santiago-Pacific	Michoacan	G, I	79.5
40	Valle de Bravo	Valle de Bravo	418	56	1944	Balsas[b]	State of Mexico	A	
41	Aurelio Benassini Vizcaino	El Salto	415	73	1986	Northern Pacific	Sinaloa	I	
42	Manuel M. Dieguez	Santa Rosa	403	114	1964	Lerma-Santiago-Pacific	Jalisco	G	61
43	Francisco Zarco	Las Tortolas	365	40	1968	Central Basins of the North	Durango	C, I	
44	Luis L. Leon	El Granero	356	62	1968	Rio Bravo	Chihuahua	I, C	
45	Plutarco Elias Calles	Calles	350	67	1931	Lerma-Santiago-Pacific	Aguascalientes	I	
46	Francisco I. Madero	Las Virgenes	348	57	1949	Rio Bravo	Chihuahua	I	
47	Manuel Avila Camacho	Valsequillo	304	85	1946	Balsas	Puebla	I	
48	Guillermo Blake Aguilar	El Sabinal	300	81	1985	Northern Pacific	Sinaloa	C. I	
49	Jose Lopez Portillo	Cerro Prieto	300	50	1984	Rio Bravo	Nuevo Leon	A, I	
50	Vicente Guerrero	Palos Altos	250	67	1968	Balsas	Guerrero	I	
51	General Ramon Corona Madrigal	Trigomil	250	107	1993	Lerma-Santiago-Pacific	Jalisco	I	
52	Federalismo Mexicano	San Gabriel	247	44	1981	Rio Bravo	Durango	I, A	
TOTAL			103 466						10 661.5

NOTES: [a] The total capacity is at the normal pool elevation.
G: Generation of electricity
I: Irrigation
A: Public use
C: Flood control
[b] This dam is part of the Cutzamala System which is operated by the Waters of the Valley of Mexico River Basin Organization.
SOURCE: CONAGUA. Deputy Director General's Office for Technical Affairs.

4.3 Hydro-Agricultural Infrastructure

The area in Mexico under irrigation is 6.46 million hectares, of which 3.50 corresponds to 85 Irrigation Districts, and 2.96 to more than 39 000 Irrigation Units.

The Irrigation Districts and Units were designed according to the prevalent technology for the application of water to plots, by means of gravity. In many cases, only the main channel and drain networks were built, with the plot work remaining the responsibility of the users. This situation, along with the deterioration of the infrastructure, made worse over decades through the scarcity of economic resources destined to their conservation and improvement, brought about a decrease in the overall efficiency of water management.

Irrigation Districts

Irrigation Districts 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.

M4.2 Irrigation Districts in Mexico, 2007

NOTE: The numbers correspond to the code of each Irrigation District, which are listed in the following table.
SOURCE: CONAGUA. Deputy Director General's Office for Hydro-agricultural Infrastructure.

T4.2 Location and surface area of the Irrigation Districts

No.	Code	Irrigation District	Hydrological-Administrative Region	State	Total surface area (hectares)
1	001	Pabellon	VIII Lerma-Santiago-Pacific	Aguascalientes	11 938
2	002	Mante	IX Northern Gulf	Tamaulipas	18 094
3	003	Tula	XIII Waters of the Valley of Mexico	Hidalgo	51 825
4	004	Don Martin	VI Rio Bravo	Coahuila de Zaragoza y Nuevo Leon	29 605
5	005	Delicias	VI Rio Bravo	Chihuahua	82 324
6	006	Palestina	VI Rio Bravo	Coahuila de Zaragoza	12 964
7	008	Metztitlan	IX Northern Gulf	Hidalgo	4 876
8	009	Juarez Valley	VI Rio Bravo	Chihuahua	24 492
9	010	Culiacan-Humaya	III Northern Pacific	Sinaloa	212 141
10	011	Upper Lerma River	VIII Lerma-Santiago-Pacific	Guanajuato	112 772
11	013	State of Jalisco	VIII Lerma-Santiago-Pacific	Jalisco	58 858
12	014	Colorado River	I Baja California Peninsula	Baja California y Sonora	208 805
13	016	State of Morelos	IV Balsas	Morelos	33 654
14	017	Lagoon Region	VII Central Basins of the North	Coahuila de Zaragoza y Durango	116 577
15	018	Colonias Yaquis	II Northwest	Sonora	22 794
16	019	Tehuantepec	V Southern Pacific	Oaxaca	44 074
17	020	Morelia-Querendaro	VIII Lerma-Santiago-Pacific	Michoacan de Ocampo	20 665
18	023	San Juan del Rio	IX Northern Gulf	Queretaro Arteaga	11 048
19	024	Chapala Marshes	VIII Lerma-Santiago-Pacific	Michoacan de Ocampo	45 176
20	025	Lower Rio Grande	VI Rio Bravo	Tamaulipas	248 001
21	026	Lower San Juan River	VI Rio Bravo	Tamaulipas	86 102
22	028	Tulancingo	IX Northern Gulf	Hidalgo	753
23	029	Xicotencatl	IX Northern Gulf	Tamaulipas	24 021
24	030	Valsequillo	IV Balsas	Puebla	49 932
25	031	Las Lajas	VI Rio Bravo	Nuevo Leon	3 693
26	033	State of Mexico	VIII Lerma-Santiago-Pacific	State of Mexico	18 080
27	034	State of Zacatecas	VIII Lerma-Santiago-Pacific	Zacatecas	18 060
28	035	La Antigua	X Central Gulf	Veracruz de Ignacio de la Llave	21 851
29	037	Altar Pitiquito Caborca	II Northwest	Sonora	57 587
30	038	Mayo River	II Northwest	Sonora	97 046
31	041	Yaqui River	II Northwest	Sonora	232 944
32	042	Buenaventura	VI Rio Bravo	Chihuahua	7 718
33	043	State of Nayarit	VIII Lerma-Santiago-Pacific	Nayarit	47 253
34	044	Jilotepec	IX Northern Gulf	State of Mexico	5 507
35	045	Tuxpan	IV Balsas	Michoacan de Ocampo	19 376
36	046	Cacahoatan-Suchiate	XI Southern Border	Chiapas	8 473
37	048	Ticul	XII Yucatan Peninsula	Yucatan	9 689
38	049	Verde River	IX Northern Gulf	San Luis Potosi	3 507
39	050	Acuña-Falcon	VI Rio Bravo	Tamaulipas	12 904
40	051	Hermosillo Coast	II Northwest	Sonora	66 296
41	052	State of Durango	III Northern Pacific	Durango	29 306
42	053	State of Colima	VIII Lerma-Santiago-Pacific	Colima	37 773
43	056	Atoyac-Zahuapan	IV Balsas	Tlaxcala	4 247
44	057	Amuco-Cutzamala	IV Balsas	Guerrero	34 515
45	059	Blanco River	XI Southern Border	Chiapas	8 432
46	060	El Higo (Panuco)	IX Northern Gulf	Veracruz de Ignacio de la Llave	2 250
47	061	Zamora	VIII Lerma-Santiago-Pacific	Michoacan de Ocampo	17 982

(continues)

(continued)

T4.2 Location and surface area of the Irrigation Districts

No.	Code	Irrigation District	Hydrological-Administrative Region	State	Total surface area (hectares)
48	063	Guasave	III Northern Pacific	Sinaloa	100 125
49	066	Santo Domingo	I Baja California Peninsula	Baja California Sur	38 101
50	068	Tepecoacuilco-Quechultenango	IV Balsas	Guerrero	1 991
51	073	La Concepcion	XIII Waters of the Valley of Mexico	State of Mexico	964
52	074	Mocorito	III Northern Pacific	Sinaloa	40 742
53	075	Fuerte River	III Northern Pacific	Sinaloa	227 518
54	076	El Carrizo Valley	III Northern Pacific	Sinaloa	51 681
55	082	Blanco River	X Golfo Centro	Veracruz de Ignacio de la Llave	21 657
56	083	Papigochic	II Northwest	Chihuahua	8 947
57	084	Guaymas	II Northwest	Sonora	16 667
58	085	La Begoña	VIII Lerma-Santiago-Pacific	Guanajuato	10 823
59	086	Soto La Marina River	IX Golfo Norte	Tamaulipas	35 925
60	087	Rosario-Mezquite	VIII Lerma-Santiago-Pacific	Michoacan de Ocampo	63 144
61	088	Chiconautla	XIII Waters of the Valley of Mexico	State of Mexico	4 498
62	089	El Carmen	VI Rio Bravo	Chihuahua	20 805
63	090	Lower Conchos River	VI Rio Bravo	Chihuahua	13 313
64	092	Panuco River, Las Animas	IX Northern Gulf	Tamaulipas	44 483
65	092	Panuco River, Chicayan	IX Northern Gulf	Veracruz de Ignacio de la Llave	54 882
66	092	Panuco River, Pujal Coy I	IX Northern Gulf	San Luis Potosi	41 382
67	093	Tomatlan	VIII Lerma-Santiago-Pacific	Jalisco	19 773
68	094	Southern Jalisco	VIII Lerma-Santiago-Pacific	Jalisco	16 940
69	095	Atoyac	V Southern Pacific	Guerrero	5 016
70	096	Arroyozarco	IX Northern Gulf	State of Mexico	18 866
71	097	Lazaro Cardenas	IV Balsas	Michoacan de Ocampo	71 593
72	098	Jose Maria Morelos	IV Balsas	Michoacan de Ocampo	5 083
73	099	Quitupan-Magdalena	IV Balsas	Michoacan de Ocampo	5 120
74	100	Alfajayucan	XIII Waters of the Valley of Mexico	Hidalgo	39 211
75	101	Cuxtepeques	XI Southern Border	Chiapas	8 267
76	102	Hondo River	XII Yucatan Peninsula	Quintana Roo	27 182
77	103	Florido River	VI Rio Bravo	Chihuahua	8 964
78	104	Cuajinicuilapa (Ometepec)	V Southern Pacific	Guerrero	6 720
79	105	Nexpa	V Southern Pacific	Guerrero	14 549
80	107	San Gregorio	XI Southern Border	Chiapas	11 227
81	108	Elota-Piaxtla	III Northern Pacific	Sinaloa	27 104
82	109	San Lorenzo River	III Northern Pacific	Sinaloa	69 399
83	110	Verde-Progreso River	V Southern Pacific	Oaxaca	5 030
84	111	Presidio River	III Northern Pacific	Sinaloa	8 435
85	112	Ajacuba	XIII Waters of the Valley of Mexico	Hidalgo	8 500
		Irrigation Zone Labores Viejas, Chihuahua[a]	VI Rio Bravo	Chihuahua	3 712
		Irrigation Zone Fuerte-Mayo, Sinaloa[b]	III Northern Pacific	Sinaloa	15 073
		Irrigation Zone Fuerte-Mayo, Sonora[b]	III Northern Pacific	Sonora	7 510
		Total			**3 496 902**

NOTE: In 2005, the Irrigation District 081 State of Campeche became a Coordination of Irrigation Units.

[a] The surface area of this irrigation zone depends operatively and administratively on the Irrigation District 005 Delicias, Chihuahua.

[b] The surface area of this irrigation zone depends operatively and administratively on the Irrigation District 076 Carrizo Valley, Sinaloa.

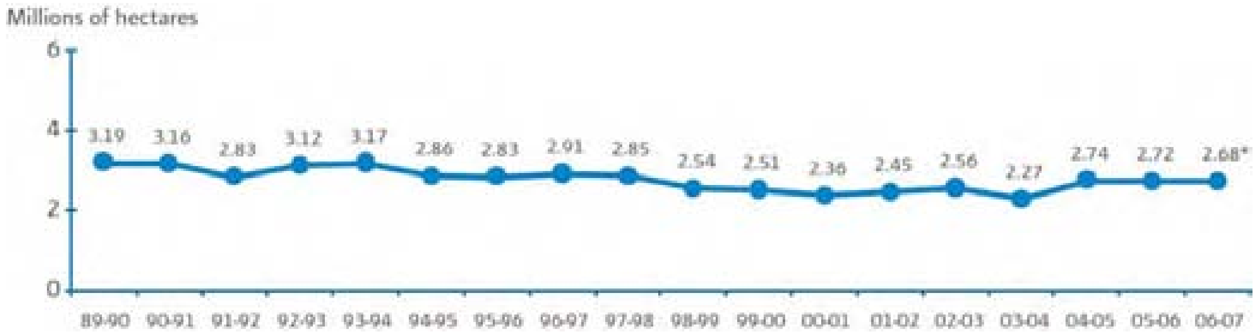
SOURCE: CONAGUA. Deputy Director General's Office for Hydro-agricultural Infrastructure.

G4.3 Volume of water used in Irrigation Districts, agricultural years from 1989-1990 to 2006-2007
(billions of cubic meters)

	89-90	90-91	91-92	92-93	93-94	94-95	95-96	96-97	97-98	98-99	99-00	00-01	01-02	02-03	03-04	04-05	05-06	06-07
Groundwater	3.5	3.4	2.8	3.1	4.1	3.8	4.3	4.3	4.0	3.9	3.9	3.8	3.6	3.8	3.6	2.8	3.6	3.3*
Surface water	29.5	30.2	27.0	30.7	31.9	26.0	25.1	29.2	25.9	21.9	23.9	21.6	23.3	20.5	20.1	25.6	27.5	30.3
Total	33.0	33.6	29.8	33.8	35.9	29.8	29.5	33.4	29.9	25.8	27.8	25.4	26.9	24.3	23.7	28.5	31.1	33.6*

NOTES: The agricultural year in Mexico includes the period from October to September of the following year.
1 km³ = 1 000 hm³ = 1 billion m³.
* Preliminary data.
SOURCE: CONAGUA. Deputy Director General's Office for Hydro-agricultural Infrastructure.

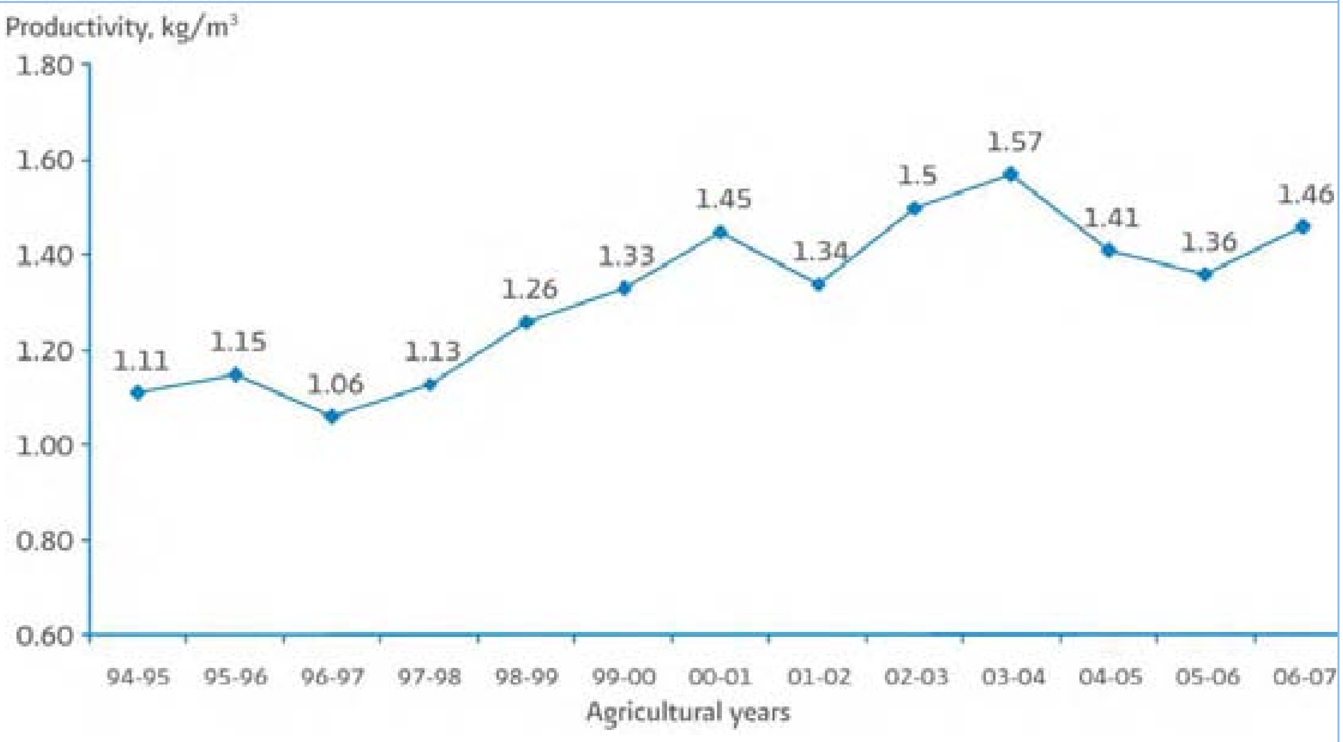
G4. Physical surface irrigated in the Irrigation Districts, agricultural years from 1989-1990 to 2006-2007



NOTE: * Preliminary data.
SOURCE: CONAGUA. Deputy Director General's Office for Hydro-agricultural Infrastructure.

The productivity of water in the Irrigation Districts is a key indicator to evaluate the efficiency with which water is used for food production, and depends upon the efficiency with which water is piped to the plots and applied there. It should be added that this indicator may vary significantly according to the meteorological conditions.

G4.5 Productivity of water in the Irrigation Districts, series of agricultural years from 1994-1995 to 2006-2007 (kg/m³)



NOTES: The agricultural year in Mexico includes the period from October to September of the following year.
The gross volume corresponds to that used during the vegetative cycle, thus explaining why it does not match the annual volumes used.
SOURCE: CONAGUA. Deputy Director General's Office for Planning. Produced based on data from the Deputy Director General's Office for Hydro-agricultural Infrastructure.

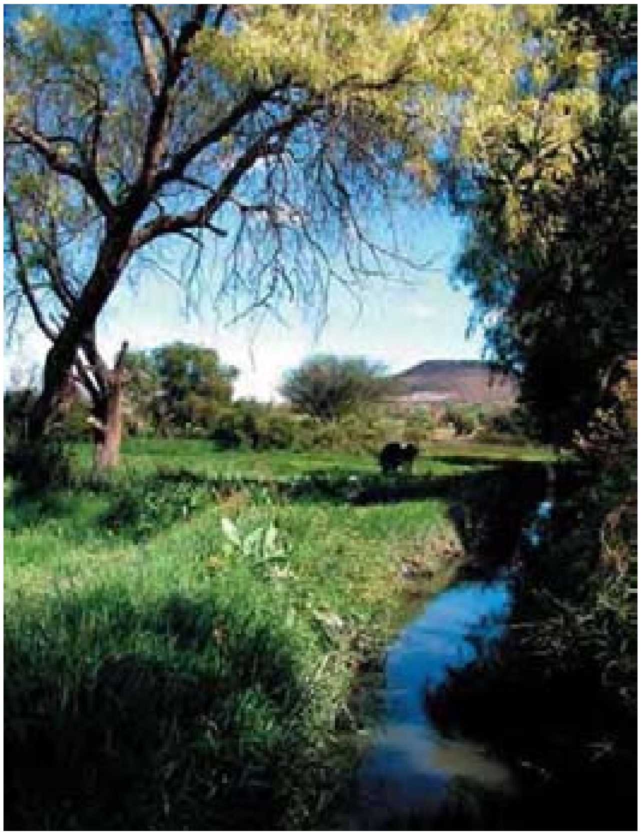
With the creation of the CONAGUA in 1989 and the passing of the new National Water Law in 1992, the transfer of the Irrigation Districts to the users began, supported by a program of partial rehabilitation of the infrastructure that was assigned via irrigation modules to user associations.

Up to December 2007, 99% of the total surface of the Irrigation Districts had been transferred to the users. Up to that time, only three Districts had not been totally transferred to the users.

T4.3 Partially transferred Irrigation Districts, 2007 (Situation as of December 31st)

No.	Name	State	Percentage transferred
003	Tula	Hidalgo	53.87
018	Colonias Yaquis	Sonora	83.39
100	Alfajayucan	Hidalgo	98.16

SOURCE: CONAGUA. Deputy Director General's Office for Hydro-agricultural Infrastructure.



Irrigation Units

The Irrigation Units (known as URDERALES in Spanish) are operated by small landholders, who in some cases are organized within the Units and in others not. As a result of their complexity, variety and generally reduced extension, no up-to-date and detailed information exists on the beneficiaries, areas, growth patterns, production statistics and volumes used in the Irrigation Units.

T4.4 Number of Irrigation Units areas, by State, 1998

	State	Irrigation Units (number)	Total irrigation surface area (ha)
1	Aguascalientes	1 203	54 206
2	Baja California	1 800	62 194
3	Baja California Sur	130	24 796
4	Campeche	316	18 951
5	Coahuila de Zaragoza	532	149 313
6	Colima	2 399	64 155
7	Chiapas	1 531	56 080
8	Chihuahua	916	185 087
9	Federal District	17	2 035
10	Durango	1 545	106 055
11	Guanajuato	1 308	291 606
12	Guerrero	5 160	39 286
13	Hidalgo	495	62 114
14	Jalisco	496	161 633
15	State of Mexico	1 880	160 930
16	Michoacan de Ocampo	2 360	224 819
17	Morelos	253	24 030
18	Nayarit	248	55 417
19	Nuevo Leon	1 155	143 012
20	Oaxaca	640	52 635
21	Puebla	2 020	122 290
22	Queretaro Arteaga	564	38 972
23	Quintana Roo	254	10 946
24	San Luis Potosi	1 255	101 306
25	Sinaloa	469	45 013
26	Sonora	925	128 027
27	Tabasco	186	15 127
28	Tamaulipas	1 148	174 431
29	Tlaxcala	585	29 710
30	Veracruz de Ignacio de la Llave	933	96 373
31	Yucatan	1 024	35 732
32	Zacatecas	5 745	219 751
Total		**39 492**	**2 956 032**

NOTE: Includes 974 units with a surface area of 102 000 ha, which corresponds to mixed Irrigation Units.
The data is from 2004, and there is no more up-to-date data.
SOURCE: CONAGUA. Deputy Director General's Office for Hydro-agricultural Infrastructure.

Technified Rainfed Districts

In the tropical and subtropical plains of the country, which have an excess of humidity and constant floods, the federal government has created the Technified Rainfed Districts, in which hydraulic works have been built to remove the excess water.

Similarly to the Irrigation Districts, the Technified Rainfed Districts have gradually been transferred to organized users.

T4.5 Characteristics of the Technified Rainfed Districts, 2007
(Situation up to December 31st)

No.	Code	Technified Rainfed District	Hydrological-Administrative Region	State	Surface (thousands of ha)	Users (number)
1	001	La Sierra	XI Southern Border	Tabasco	32.1	1 178
2	002	Zanapa Tonala	XI Southern Border	Tabasco	106.9	6 919
3	003	Tesechoacan	X Central Gulf	Veracruz de Ignacio de la Llave	18.0	1 139
4	005	Pujal Coy II	IX Northern Gulf	San Luis Potosi and Tamaulipas	220.0	9 987
5	006	Acapetahua	XI Southern Border	Chiapas	103.9	5 050
6	007	Centro de Veracruz	X Central Gulf	Veracruz de Ignacio de la Llave	75.0	6 367
7	008	Oriente de Yucatan	XII Yucatan Peninsula	Yucatan	667.0	25 021
8	009	El Bejuco	III Northern Pacific	Nayarit	25.4	2 261
9	010	San Fernando	IX Northern Gulf	Tamaulipas	505.0	13 975
10	011	Margaritas-Comitan	XI Southern Border	Chiapas	48.0	5 397
11	012	La Chontalpa	XI Southern Border	Tabasco	91.0	5 000
12	015	Edzna-Yohaltuna	XII Yucatan Peninsula	Campeche	85.1	1 120
13	016	Sanes Huastecaa	XI Southern Border	Tabasco	26.4	1 321
14	017	Tapachula	XI Southern Border	Chiapas	94.3	5 852
15	018	Huixtla	XI Southern Border	Chiapas	107.6	6 010
16	020	Margaritas-Pijijiapan	XI Southern Border	Chiapas	68.0	4 712
17	023	Isla Rodriguez-Clara	X Central Gulf	Veracruz de Ignacio de la Llave	13.7	627
18	024	Zona Sur de Yucatan	XII Yucatan Peninsula	Yucatan	67.3	880
19	025	Rio Verde	XII Yucatan Peninsula	Campeche	134.9	1 984
20	026	Valle de Ucum[a]	XII Yucatan Peninsula	Quintana Roo	104.8	1 739
21	027	Frailesca[a]	XI Southern Border	Chiapas	56.8	3 083
22	035	Los Naranjos[a]	X Central Gulf	Veracruz de Ignacio de la Llave	92.6	6 045
Total					**2 743.8**	**115 667**

NOTE: [a] Technified Rainfed Districts that have not yet been transferred to the users.
SOURCE: CONAGUA. Deputy Director General's Office for Hydro-agricultural Infrastructure.

4.4 Drinking Water and Sanitation Infrastructure

Drinking water coverage

The CONAGUA considers that drinking water coverage includes those who have tap water in their household; outside of their household, but within the grounds; from a public tap or from another household. Covered inhabitants do not necessarily dispose of water of drinking quality.

Bearing in mind this definition and the results of the Census on Population and Housing from 2005, up to October 17th that year, 89.2% of the population had drinking water coverage. The CONAGUA estimates that at the end of 2007, the drinking water coverage was 89.9%. The following table shows the evolution of the drinking water coverage to the population of Mexico.

T4.6 Composition of the national drinking water coverage, series of Censual years from 1990 to 2005

Date	With tap water in their grounds[a] (%)	Other forms of supply[b] (%)	Total (%)
March 12th, 1990	75.4	3.0	78.4
November 5th, 1995	83.0	1.60	84.6
February 14th, 2000	83.3	4.5	87.8
October 17th, 2005	87.1	2.1	89.2

NOTE: [a] Refers to tap water within their household, and outside of the household but within their grounds.
[b] Refers to water obtained by transport, from a public tap or from another household.
SOURCE: CONAGUA. Deputy Director General's Office for Planning. Produced based on:
CONAGUA. Portable Information Cubes. 2008, Population, Housing and Water, Uses of Water and Hypercube.
Analysis of the Information on Water in the Censuses from 1990 to 2005. September 2007.
National Water Program 2007-2012. This is how we're doing... Progress 2007 and Targets for 2008.
INEGI. General Censuses of Population and Housing. INEGI. Information published in various formats.

Sanitation coverage

On the other hand, the CONAGUA considers that sanitation coverage includes those connected to the sanitation network or a septic tank, overflow, ravine, crevice, lake or sea. It should be added that for the purpose of this document, sanitation and sewerage are considered as synonyms.

Bearing in mind this definition and the results of the 2005 Census on Population and Housing, up to October 17th of that year, 85.6% of the population had sanitation coverage. The CONAGUA estimates that at the end of 2007, the sanitation coverage was 86.1%. The following table shows the evolution of the national sanitation coverage:

T4.7 Composition of the national sanitation coverage, series of Censual years from 1990 to 2005

Date	Connected to the public network (%)	Connected to a septic tank (%)	Others[a] (%)	Total (%)
March 12th, 1990	50.1	8.6	2.8	61.5
November 5th, 1995	57.5	11.7	3.2	72.4
February 14th, 2000	61.5	11.4	3.3	76.2
October 17th, 2005	67.6	15.9	2.1	85.6

NOTE: [a] Refers to an overflow, ravine, crevice, lake or sea
SOURCE: CONAGUA. Deputy Director General's Office for Planning. Produced based on:
CONAGUA. Portable Information Cubes. 2008, Population, Housing and Water, Uses of Water and Hypercube.
Analysis of the Information on Water in the Censuses from 1990 to 2005. September 2007.
National Water Program 2007-2012. This is how we're doing... Progress 2007 and Targets for 2008.
INEGI. General Censuses of Population and Housing. INEGI. Information published in various formats.

T4.8 Coverage of the population with drinking water and sanitation coverage, in urban and rural zones in Mexico, series of Censual years from 1990 to 2005

Population	1990 Census March 12th, 1990 (%)	1995 Census November 5th, 1995 (%)	2000 Census February 14th, 2000 (%)	2005 Census October 17th, 2005 (%)
Drinking water				
Urban	89.4	93.0	94.6	95.0
Rural	51.2	61.2	68.0	70.7
Total	78.4	84.6	87.8	89.2
Sanitation				
Urban	79.0	87.8	89.6	94.5
Rural	18.1	29.6	36.7	57.5
Total	61.5	72.4	76.2	85.6

SOURCE: CONAGUA. Deputy Director General's Office for Planning. Produced based on:
CONAGUA. Portable Information Cubes. 2008, Population, Housing and Water, Uses of Water and Hypercube.
INEGI. General Censuses of Population and Housing. INEGI. Information published in various formats.

In the following table, the drinking water and sanitation coverage is indicated by Hydrological-Administrative Region. It may be observed that the greatest backlogs in both aspects are found in the regions V Southern Pacific, XI Southern Border and X Central Gulf.

T4.9 Coverage of the population with drinking water and sanitation by Hydrological-Administrative Region, series of Censual years from 1990 to 2005

Hydrological-Administrative Region	Drinking water (%)				Sanitation (%)			
	Mar. 12th, 90	Nov. 05th, 95	Feb. 14th, 00	Oct. 17th, 05	Mar. 12th, 90	Nov. 05th, 95	Feb. 14th, 00	Oct. 17th, 05
I Baja California Peninsula	81.3	87.4	92.0	92.9	65.2	75.8	80.6	89.0
II Northwest	89.7	93.2	95.2	94.8	62.6	71.5	76.5	84.1
III Northern Pacific	78.7	85.6	88.8	89.0	51.7	63.9	69.9	82.6
IV Balsas	72.8	81.1	83.2	84.4	48.8	63.0	67.5	81.4
V Southern Pacific	59.2	69.0	73.2	73.5	33.3	46.5	47.4	63.3
VI Rio Bravo	91.8	94.4	96.1	96.1	73.9	84.0	88.2	93.8
VII Central Basins of the North	83.2	87.9	90.9	93.3	55.4	65.3	73.3	85.6
VIII Lerma-Santiago-Pacific	84.2	90.3	92.2	93.4	68.0	79.8	82.5	90.1
IX Northern Gulf	57.6	67.8	75.5	80.9	33.9	42.2	50.0	65.3
X Central Gulf	58.8	64.6	71.9	77.2	45.9	55.9	60.1	74.8
XI Southern Border	56.7	65.4	73.3	74.4	45.5	62.3	67.7	80.7
XII Yucatan Peninsula	74.0	84.9	91.9	94.1	45.1	57.5	63.2	76.3
XIII Waters of the Valley of Mexico	92.5	96.3	96.9	96.5	85.9	93.1	94.4	97.2
Total	**78.4**	**84.6**	**87.8**	**89.2**	**61.5**	**72.4**	**76.2**	**85.6**

SOURCE: CONAGUA. Deputy Director General's Office for Planning. Produced based on:
CONAGUA. Portable Information Cubes. 2008, Population, Housing and Water, Uses of Water and Hypercube.
INEGI. General Censuses of Population and Housing.

The greatest backlogs in drinking water coverage are to be found in Guerrero, Oaxaca and Chiapas, whereas for sanitation, Oaxaca, Guerrero and Yucatan are the states with the lowest percentages of coverage.

T4.10 Coverage of the population with drinking water and sanitation services by Hydrological-Administrative Region, series of Censual years from 1990 to 2005

	State	Drinking water (%)				Sanitation (%)			
		Mar. 12th, 90	Nov. 05th, 95	Feb. 14th, 00	Oct. 17th, 05	Mar. 12th, 90	Nov. 05th, 95	Feb. 14th, 00	Oct. 17th, 05
1	Aguascalientes	95.5	98.0	97.9	97.8	85.2	93.7	94.5	96.9
2	Baja California	79.8	86.7	91.9	93.8	65.4	76.0	80.7	88.9
3	Baja California Sur	89.4	90.9	92.5	87.7	64.4	74.6	79.9	89.7
4	Campeche	69.8	78.3	84.7	88.4	44.2	58.5	60.8	78.4
5	Coahuila de Zaragoza	91.9	94.6	97.0	97.3	67.3	76.1	83.3	91.5
6	Colima	93.0	95.8	97.1	97.8	81.8	93.9	93.1	98.2
7	Chiapas	57.3	65.6	73.5	73.5	38.4	52.6	59.3	74.7
8	Chihuahua	87.6	91.8	93.1	92.9	65.8	79.0	84.3	89.8
9	Federal District	96.1	97.7	97.9	97.6	93.3	97.7	98.1	98.6
10	Durango	84.6	89.6	91.6	90.9	52.5	64.7	71.8	82.6
11	Guanajuato	82.4	88.9	92.0	93.4	58.0	70.6	75.3	85.8
12	Guerrero	55.1	64.7	69.1	68.0	34.8	46.3	49.7	64.2
13	Hidalgo	69.4	79.5	83.9	87.2	41.6	56.2	64.0	79.1
14	Jalisco	85.7	91.3	92.4	93.3	80.3	89.5	91.2	95.8
15	State of Mexico	84.6	91.5	92.8	93.2	72.5	83.4	84.9	91.2
16	Michoacan de Ocampo	78.2	86.4	88.2	89.4	55.5	69.3	72.9	84.2
17	Morelos	88.3	90.3	91.6	91.6	67.0	81.2	83.6	92.6
18	Nayarit	83.4	86.7	89.6	91.4	59.1	75.0	78.8	90.9
19	Nuevo Leon	92.9	94.5	95.6	95.6	80.8	88.6	91.1	95.3
20	Oaxaca	57.2	67.0	72.0	73.3	28.5	42.0	42.9	60.0
21	Puebla	70.2	78.6	82.8	85.4	45.3	56.5	62.8	79.0
22	Queretaro Arteaga	82.8	89.2	92.3	93.7	54.0	67.2	73.7	85.6
23	Quintana Roo	88.7	89.1	93.8	94.5	54.3	76.1	81.3	89.5
24	San Luis Potosi	65.5	73.5	78.2	82.7	46.2	53.5	59.2	74.2
25	Sinaloa	79.8	88.0	91.8	93.1	53.5	67.3	73.1	86.4
26	Sonora	91.0	94.0	95.7	95.2	64.9	73.5	78.2	85.4
27	Tabasco	55.4	65.1	72.8	76.4	60.6	82.0	84.4	93.4
28	Tamaulipas	80.9	88.9	94.1	94.7	57.8	65.6	73.4	82.4
29	Tlaxcala	90.9	95.6	96.3	97.3	57.1	75.5	81.9	90.6
30	Veracruz de Ignacio de la Llave	57.5	62.2	69.9	76.3	50.1	60.4	64.6	77.7
31	Yucatan	70.2	85.5	93.7	96.1	42.1	48.8	54.6	68.2
32	Zacatecas	74.8	82.7	88.0	92.8	45.0	58.0	69.3	84.2
Total		**78.4**	**84.6**	**87.8**	**89.2**	**61.5**	**72.4**	**76.2**	**85.6**

SOURCE: CONAGUA. Deputy Director General's Office for Planning. Produced based on:
CONAGUA. Portable Information Cubes. 2008, Population, Housing and Water, Uses of Water and Hypercube.
INEGI. General Censuses of Population and Housing.

Aqueducts

There are more than 3 000 kilometers of aqueducts in Mexico that take water to various cities and rural communities around the country, with a total capacity of more than 112 cubic meters per second.

As regards their length and flow, the following stand out:

T4.11 Main aqueducts in Mexico, by Hydrological-Administrative Region, 2007

No.	Aqueduct	Hydrological-Administrative Region	Length (km)	Flow by design (L/s)	Year of comple-tion	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-Pacifico Norte	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 the Valley of Mexico with water from the Valle de Bravo, Villa Victoria and El Bosque dams, among others	CONAGUA, Waters of the Valley of Mexico River Basin Organi-zation
4	Linares Monterrey	VI Rio Bravo	133	5 000	1984	The metropolitan area of the city of Monterrey, Nuevo Leon, with water from the Cerro Prieto dam	Water and Sanitation Services of Monterrey, I. P. D.
5	El Cuchillo-Monterrey	VI Rio Bravo	91	5 000	1994	The metropolitan area of the city of Monterrey with water from the El Cuchillo dam	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 River Lerma	Water System of Mexico City (SACM)
7	Armeria-Manzanillo	VIII Lerma-Santiago-Pacific	50	250	1987	City of Manzanillo, Colima	Manzanillo Drinking Water, Drainage and Sanitation Com-mission, 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	Intermunicipal System for Drinking Water and Sanitation Services (SIAPA)
9	Presa Vicente Guerrero-Ciudad Victoria	IX Northern Gulf	54	1 000	1992	Victoria City, Tamaulipas, with water from the Vicente Guerrero dam	Municipal Drinking Water and Sanitation Commission (COMA-PA Victoria)
10	Uspanapa-La Cangreja	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	Cities of Coatzacoalcos and Minatitlan, Veracruz with water from the rivers Ocotal and Tizizapa	Coatzacoalcos Municipal Water and Sanitation Commission, Ve-racruz (CMAPS Coatzacoalcos)
12	Rio Huitzilapan-Xalapa	X Central Gulf	55	1 000	2000	City of Xalapa de Enriquez, Ve-racruz de Ignacio de la Llave	Xalapa Municipal Water and Sanitation Commission (CMAS)
13	Chicbul-Ciudad del Carmen	XII Yucatan Peninsula	122	420	1975	Localities of Sabancuy, Isla Aguada and City of El Carmen, Campeche	Campeche Municipal Drinking Water System City of El Car-men, Campeche

SOURCE: CONAGUA. Deputy Director General's Office for Drinking Water, Sewerage, and Sanitation.

Cutzamala System

The Cutzamala System, which supplies 11 delegations of the Federal District and 11 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 transports (approximately 480 million cubic meters every year), but also because of the difference in elevation (1 100 m) that it overcomes. The system is made up of 7 weirs and storage dams, 6 pumping stations and one water treatment plant with the characteristics that are shown in the following table.

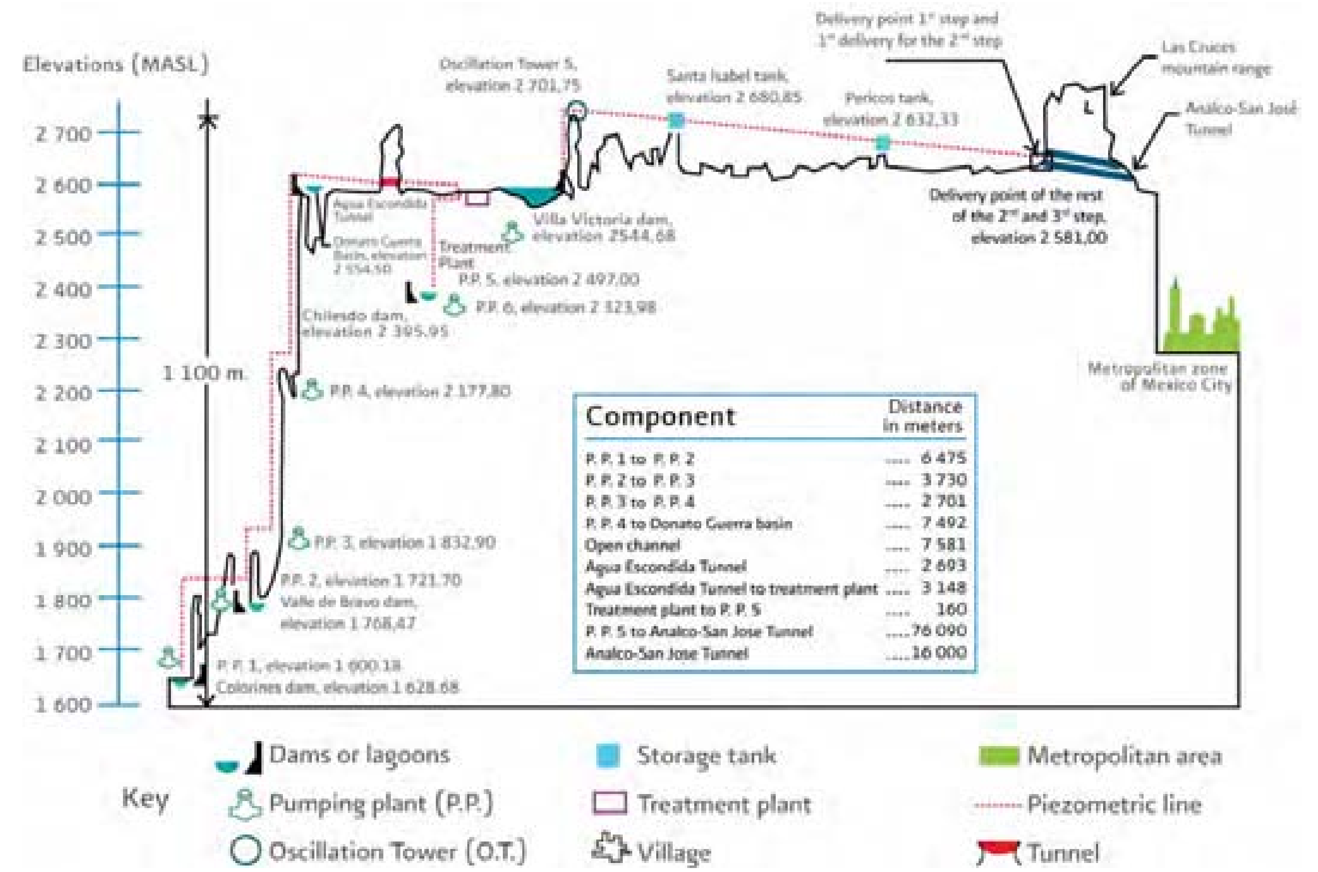
The figure G4.6 shows the difference in elevation that has to be overcome from the lowest part of pumping plant No. 1 to deliver the water to Oscillation Tower No. 5 and then deliver it by gravity to the Metropolitan Zone of the Valley of Mexico.

T4.12 Characteristics of the elements that make up the Cutzamala System

Element	Type	Capacity	Elevation (MALS)	Comments
Tuxpan	Weir	5 hm³	1 751	Surcharge pool elevation height 1 763
El Bosque	Storage dam	202 hm³	1 741	Surcharge pool elevation height 1 743
Ixtapan del Oro	Weir	0.5 hm³	1 650	Surcharge pool elevation height 1 700
Colorines	Weir	1.5 hm³	1 629	Surcharge pool elevation height 1 678
Valle de Bravo	Storage dam	395 hm³	1 768	Surcharge pool elevation height 833
Villa Victoria	Storage dam	186 hm³	2 545	Surcharge pool elevation height 2 608
Chilesdo	Weir	1.5 hm³	2 396	Surcharge pool elevation height 2 359
Pumping plant 1	Pumps	20 m^3/s	1 600	
Pumping plant 2	Pumps	24 m^3/s	1 722	Operates in conjunction with pumping plants 3 and 4
Pumping plant 3	Pumps	24 m^3/s	1 833	Operates in conjunction with pumping plants 2 and 4
Pumping plant 4	Pumps	24 m^3/s	2 179	Operates in conjunction with pumping plants 2 and 3
Pumping plant 5	Pumps	29.1 m^3/s	2 497	
Pumping plant 6	Pumps	5.1 m^3/s	2 324	
Los Berros Treatment plant	Treatment plant	20 m^3/s	2 540	

NOTE: MASL: Meters above sea level
SOURCE: CONAGUA. Waters of the Valley of Mexico River Basin Organization.

G4.6 Profile of the Cutzamala System



NOTE: MASL: Meters above sea level
SOURCE: CONAGUA. Waters of the Valley of Mexico River Basin Organization. Statistics from the Region XIII. 2007.

T4.13 Volumes and flows supplied by the Cutzamala System, annual series from 1991 to 2007

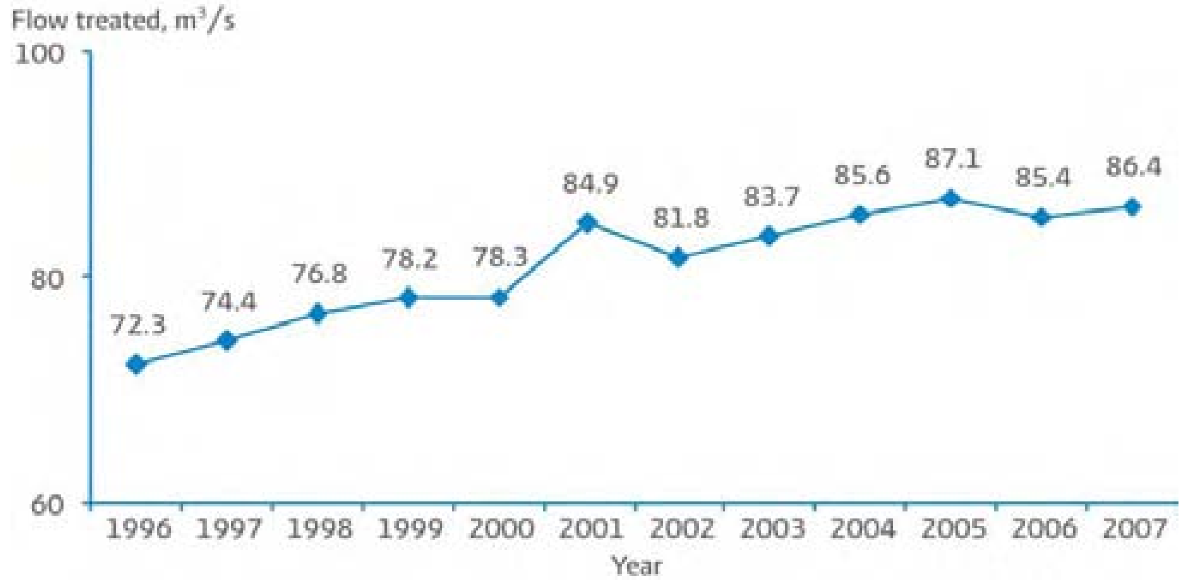
Year	Delivery to the Federal District		Delivery to the State of Mexico		Total	
	Volume (hm³/year)	Average flow (m³/s)	Volume (hm³/year)	Average flow (m³/s)	Volume (hm³/year)	Average flow (m³/s)
1991	238.92	7.59	78.11	2.49	317.03	10.08
1992	224.89	7.05	89.66	2.81	314.55	9.85
1993	251.79	8.10	90.44	2.91	342.23	11.02
1994	304.34	9.67	106.31	3.38	410.65	13.05
1995	309.12	9.80	121.39	3.85	430.51	13.65
1996	305.63	9.62	145.66	4.57	451.29	14.18
1997	320.71	10.16	159.17	5.05	479.88	15.21
1998	313.07	9.93	141.64	4.49	454.72	14.42
1999	319.30	10.21	159.45	5.10	478.75	15.30
2000	306.70	9.68	176.55	5.57	483.25	15.24
2001	303.14	9.64	173.35	5.51	476.49	15.15
2002	303.66	9.65	175.99	5.60	479.65	15.26
2003	310.70	9.77	185.23	5.83	495.93	15.59
2004	310.67	9.84	177.73	5.64	488.40	15.48
2005	310.39	9.84	182.80	5.64	493.19	15.48
2006	303.53	9.61	177.26	5.61	480.79	15.21
2007	303.90	9.72	174.56	5.58	478.46	15.30

SOURCE: CONAGUA. Waters of the Valley of Mexico River Basin Organization.

Treatment plants

Water treatment plants condition the water quality of surface and/or groundwater sources for public urban use. In 2007, 86.4 m^3/s were treated in the 541 plants in operation in the country.

G4.7 Flow of treated water, annual series from 1996 to 2007
(cubic meters / second, m^3/s)



SOURCE: CONAGUA. Deputy Director General's Office for Planning. Produced based on data from Deputy Director General's Office for Drinking Water, Sewerage, and Sanitation.

T4.14 Treatment plants in operation, by Hydrological-Administrative Region, 2007

Hydrological-Administrative Region	Number of plants in operation	Capacity installed (m^3/s)	Flow treated (m^3/s)
I Baja California Peninsula	38	11.17	6.38
II Northwest	20	2.89	1.58
III Northern Pacific	150	9.08	7.23
IV Balsas	21	23.18	17.58
V Southern Pacific	8	3.18	2.59
VI Rio Bravo	58	25.96	15.82
VII Central Basins of the North	48	0.37	0.25
VIII Lerma-Santiago-Pacific	73	19.37	12.11
IX Northern Gulf	40	6.59	5.83
X Central Gulf	7	6.40	4.58
XI Southern Border	40	13.17	8.22
XII Yucatan Peninsula	1	0.01	0.01
XIII Waters of the Valley of Mexico	37	5.12	4.23
Total	**541**	**126.49**	**86.39**

[a] Includes the Los Berros treatment plant, in the locality of the same name in the municipality of Villa de Allende, State of Mexico, which is part of the Cutzamala System and is operated by the Waters of the Valley of Mexico River Basin Organization.
SOURCE: CONAGUA. Deputy Director General's Office for Drinking Water, Sewerage, and Sanitation.

T4.15 Treatment plants in operation by State, 2007

	State	Number of plants in operation	Capacity installed (m^3/s)	Flow treated (m^3/s)
1	Aguascalientes	2	0.04	0.02
2	Baja California	26	10.70	6.02
3	Baja California Sur	12	0.47	0.36
4	Campeche	2	0.03	0.02
5	Coahuila de Zaragoza	18	2.13	1.71
6	Colima	25	0.01	0.01
7	Chiapas	4	4.50	2.51
8	Chihuahua	4	0.65	0.38
9	Federal District	33	3.66	3.01
10	Durango	30	0.03	0.02
11	Guanajuato	9	0.34	0.28
12	Guerrero	11	3.28	2.97
13	Hidalgo	2	0.13	0.13
14	Jalisco	24	16.20	9.49
15	State of Mexico	10	22.14	16.72
16	Michoacan de Ocampo	6	2.95	2.50
17	Morelos	0	0.00	0.00
18	Nayarit	0	0.00	0.00
19	Nuevo Leon	8	14.40	7.15
20	Oaxaca	6	1.29	0.77
21	Puebla	4	0.72	0.55
22	Queretaro Arteaga	6	0.27	0.21
23	Quintana Roo	0	0.00	0.00
24	San Luis Potosi	14	1.13	0.82
25	Sinaloa	142	9.07	7.22
26	Sonora	20	2.89	1.58
27	Tabasco	35	8.65	5.70
28	Tamaulipas	55	14.22	11.49
29	Tlaxcala	0	0.00	0.00
30	Veracruz de Ignacio de la Llave	8	6.60	4.76
31	Yucatan	0	0.00	0.00
32	Zacatecas	25	0.005	0.005
Total		**541**	**126.49**	**86.39**

SOURCE: CONAGUA. Deputy Director General's Office for Drinking Water, Sewerage, and Sanitation.

T4.16 Main treatment processes applied, 2007

Central process	Purpose	Plants		Flow treated	
		No.	%	m^3/s	%
Softening	Elimination of hardness	11	2.0	0.65	0.75
Adsorption	Elimination of organic traces	13	2.4	1.27	1.47
Conventional treatment	Elimination of suspended solids	184	34.0	58.25	67.43
Patented treatment	Elimination of suspended solids	137	25.3	6.58	7.62
Reversible electrodialysis	Elimination of dissolved solids	2	0.4	0.12	0.14
Direct filtration	Elimination of suspended solids	58	10.7	14.58	16.87
Slow filters	Elimination of suspended solids	6	1.1	0.04	0.05
Reverse osmosis	Elimination of dissolved solids	114	21.1	1.43	1.65
Removal of iron and manganese		16	3.0	3.48	4.02
Total		**541**	**100.0**	**86.39**	**100.0**

SOURCE: CONAGUA. Deputy Director General's Office for Drinking Water, Sewerage, and Sanitation.

4.5 Water Treatment and Reuse

Wastewater discharges

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

Wastewater treatment

Municipal wastewater treatment plants

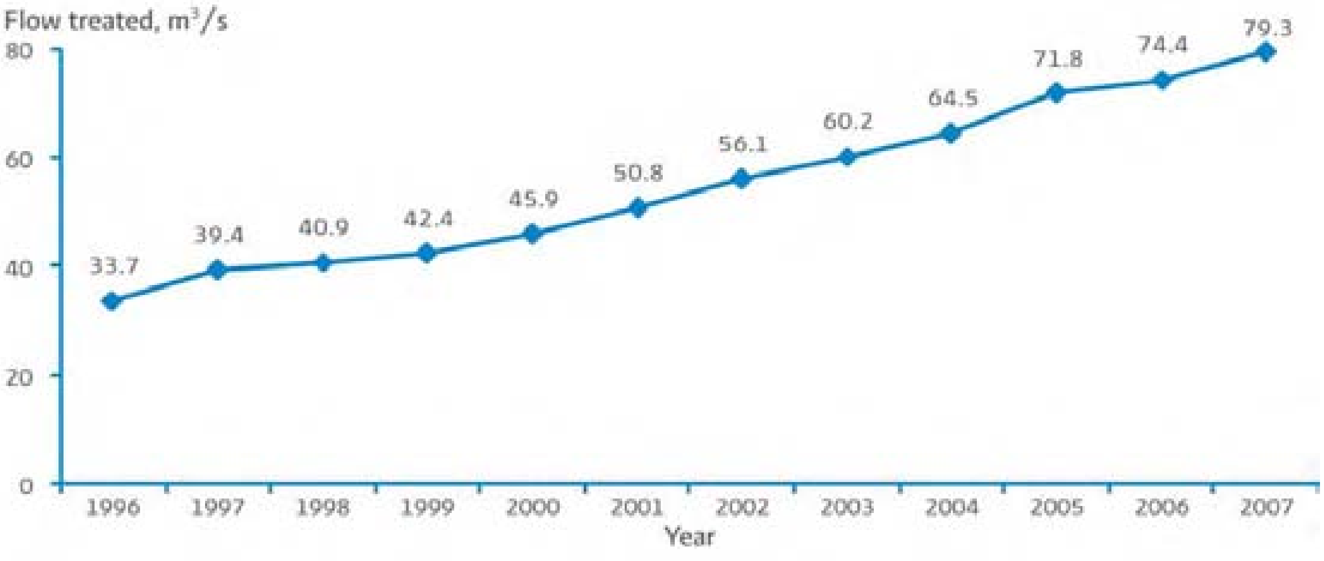
In 2007, the 1 710 plants in operation in Mexico treated 79.3 m³/s, or 38.3% of the 207 m³/s, collected in sewerage systems.

T4.17 Municipal and non-municipal wastewater discharges, 2007

Urban centers (municipal discharges)		
Wastewater	7.66	km³/year (243 m³/s)
Collected in sewerage	6.53	km³/year (207 m³/s)
Treated	2.50	km³/year (79.3 m³/s)
Generated	2.07	Millions of tons of BOD_5 per year
Collected in sewerage	1.76	Millions of tons of BOD_5 per year
Removed from treatment systems	0.53	Millions of tons of BOD_5 per year
Industrial uses (non-municipal)		
Wastewater	5.98	km³/year (188.7 m³/s)
Treated	0.94	km³/year (29.9 m³/s)
Generated	6.95	Millions of tons of BOD_5 per year
Removed from treatment systems	1.10	Millions of tons of BOD_5 per year

NOTE: BOD_5 Five-day Biochemical Oxygen Demand.
1 km³ = 1 000 hm³ = 1 billion m³.
SOURCE: CONAGUA. Deputy Director General's Office for Drinking Water, Sewerage, and Sanitation and Deputy Director General's Office for Technical Affairs.

G4.8 Flow of municipal wastewater treated, annual series from 1996 to 2007
(cubic meters per second, m³/s)



SOURCE: CONAGUA. Deputy Director General's Office for Planning. Produced based on data from the Deputy Director General's Office for Drinking Water, Sewerage, and Sanitation.

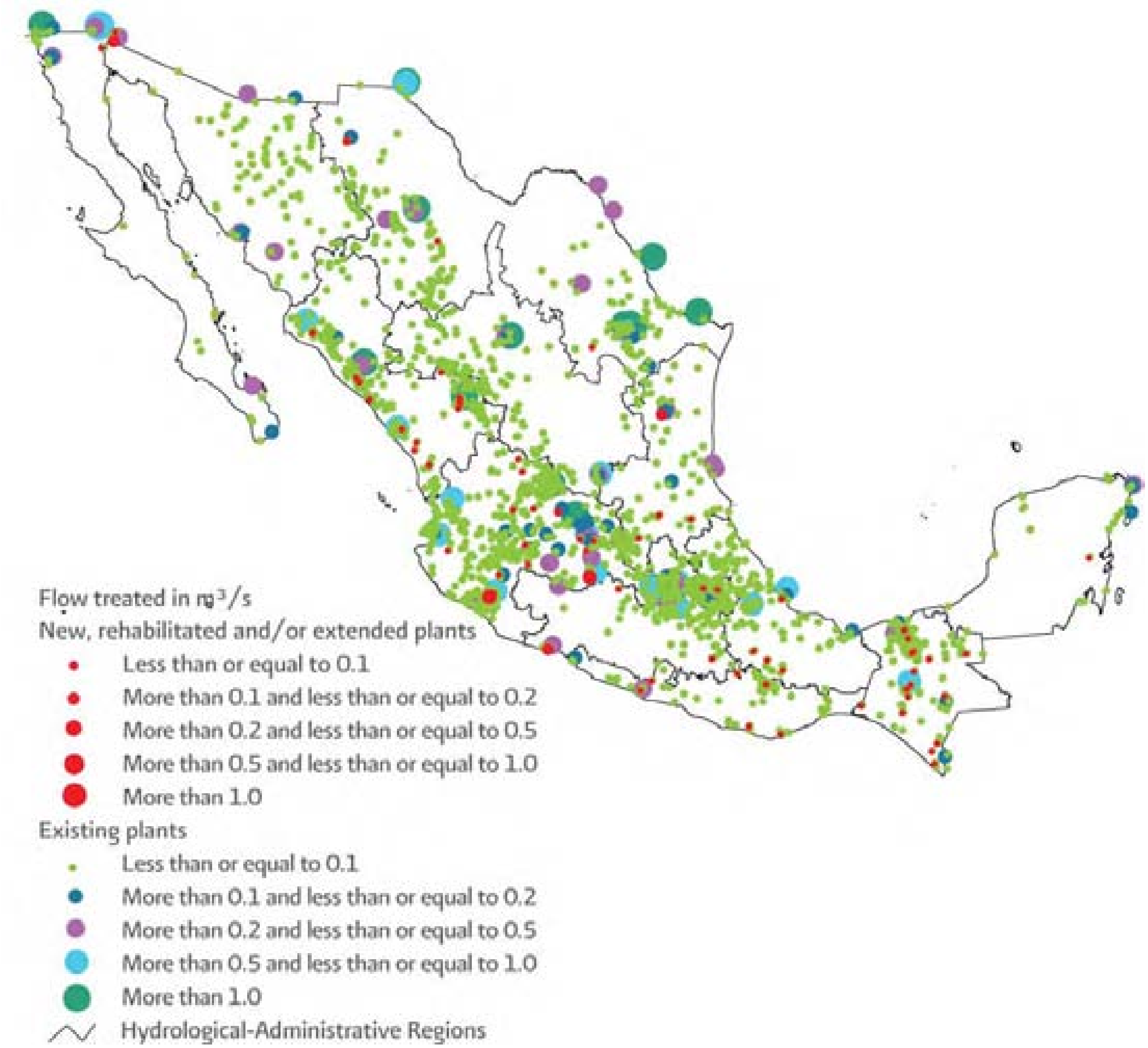
The following table indicates the wastewater treatment plants in operation by Hydrological-Administrative Region.

T4.18 Municipal wastewater treatment plants in operation, by Hydrological-Administrative Region, 2007

	Hydrological-Administrative Region	Number of plants in operation	Capacity installed (m^3/s)	Flow treated (m^3/s)
I	Baja California Peninsula	41	7.71	5.77
II	Northwest	80	4.28	3.09
III	Northern Pacific	229	8.08	6.16
IV	Balsas	138	7.24	5.13
V	Southern Pacific	78	2.55	1.58
VI	Rio Bravo	181	25.53	21.78
VII	Central Basins of the North	106	5.15	4.01
VIII	Lerma-Santiago-Pacific	421	22.55	17.27
IX	Northern Gulf	84	2.26	1.96
X	Central Gulf	122	4.67	2.64
XI	Southern Border	95	3.33	2.50
XII	Yucatan Peninsula	52	2.24	1.72
XIII	Waters of the Valley of Mexico	83	10.70	5.70
Total		**1 710**	**106.27**	**79.29**

SOURCE: CONAGUA. Deputy Director General's Office for Drinking Water, Sewerage, and Sanitation.

M4.3 Municipal wastewater treatment plants up to December 2007



SOURCE: CONAGUA. Deputy Director General's Office for Drinking Water, Sewerage and Sanitation.

T4.19 Municipal wastewater treatment plants in operation, by State, 2007

	State	Number of plants in operation	Capacity installed (m^3/s)	Flow treated (m^3/s)
1	Aguascalientes	108	3.91	3.03
2	Baja California	25	6.52	4.93
3	Baja California Sur	16	1.20	0.84
4	Campeche	10	0.08	0.05
5	Coahuila de Zaragoza	20	3.77	2.97
6	Colima	50	1.44	0.95
7	Chiapas	24	1.51	1.18
8	Chihuahua	119	8.72	6.31
9	Federal District	27	6.48	2.81
10	Durango	165	3.53	2.58
11	Guanajuato	36	5.74	4.26
12	Guerrero	35	1.94	1.07
13	Hidalgo	12	0.22	0.21
14	Jalisco	96	3.77	3.39
15	State of Mexico	75	7.22	4.90
16	Michoacan de Ocampo	25	3.52	2.47
17	Morelos	27	1.33	1.06
18	Nayarit	60	1.96	1.20
19	Nuevo Leon	61	13.09	11.87
20	Oaxaca	65	0.91	0.69
21	Puebla	67	3.02	2.42
22	Queretaro Arteaga	63	1.11	0.71
23	Quintana Roo	29	2.08	1.60
24	San Luis Potosi	19	2.10	1.73
25	Sinaloa	120	5.02	4.18
26	Sonora	66	4.19	3.00
27	Tabasco	70	1.81	1.32
28	Tamaulipas	33	3.63	3.57
29	Tlaxcala	52	1.23	0.87
30	Veracruz de Ignacio de la Llave	87	4.68	2.65
31	Yucatan	13	0.08	0.07
32	Zacatecas	35	0.48	0.42
	Total	**1 710**	**106.27**	**79.29**

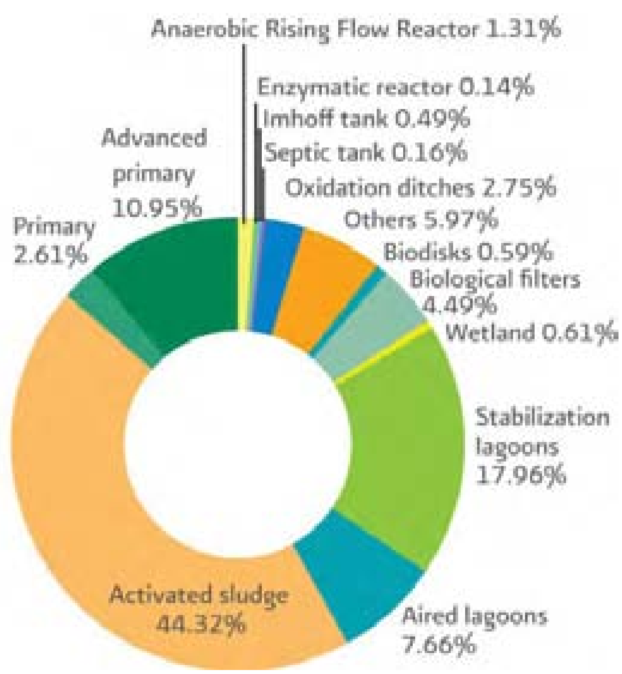
SOURCE: CONAGUA. Deputy Director General's Office for Drinking Water, Sewerage and Sanitation.

T4.20 Main municipal wastewater treatment processes, 2007

Process	Number	Flow treated (m^3/s)	Percentage
Biodisks	6	0.47	0.59%
Biological filters	74	3.56	4.49%
Stabilization lagoons	646	14.24	17.96%
Aired lagoons	26	6.08	7.66%
Activated sludge	417	35.14	44.32%
Primary	13	2.07	2.61%
Advanced primary	14	8.68	10.95%
A.R.F.R.[a]	111	1.04	1.31%
Enzymatic reactor	59	0.11	0.14%
Imhoff tank	59	0.39	0.49%
Septic tank	77	0.13	0.16%
Wetland	130	0.48	0.61%
Oxidation ditches	20	2.18	2.75%
Others	58	4.73	5.97%
Total	**1 710**	**79.29**	**100.0%**

NOTE: [a] Anaerobic Rising Flow Reactor.
SOURCE: CONAGUA. Deputy Director General's Office for Drinking Water, Sewerage and Sanitation.

G4.9 Main municipal wastewater treatment processes, 2007

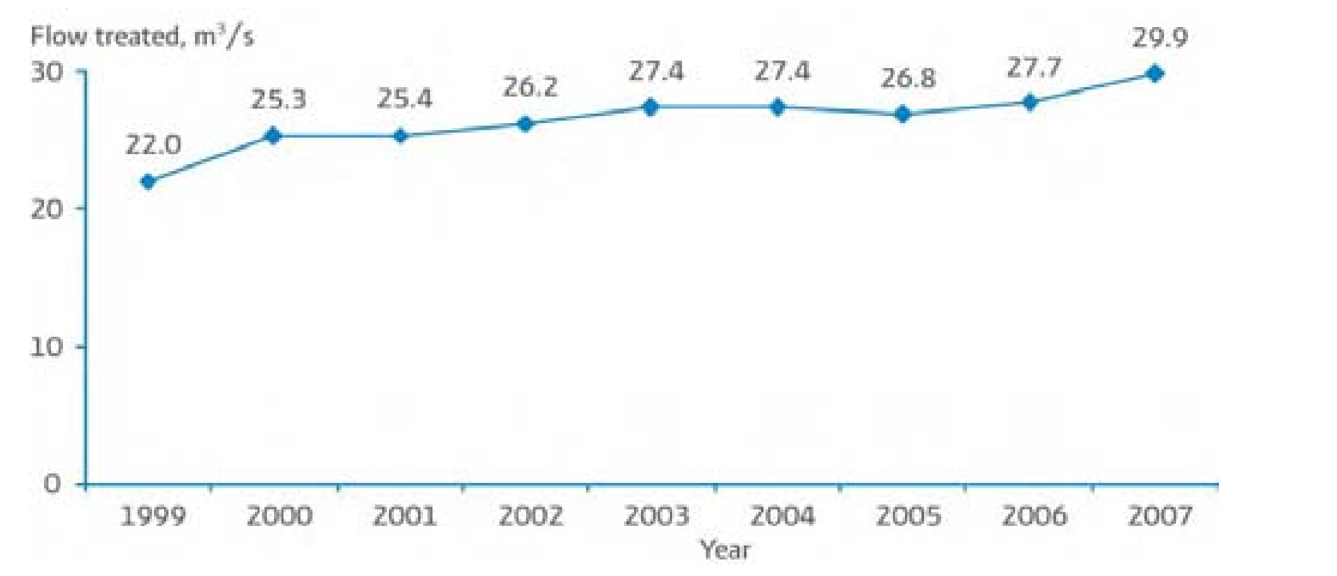


SOURCE: CONAGUA. Deputy Director General's Office for Drinking Water, Sewerage and Sanitation.

Industrial wastewater treatment plants

In 2007, industry treated 29.9 m³/s of wastewater, in 2 021 plants in operation nationwide.

G4.10 Flow of industrial wastewater treated, annual series from 1996 to 2007
(cubic meters per second, m³/s)



SOURCE: CONAGUA. Deputy Director General's Office for Planning. Produced based on data from the Deputy Director General's Office for Technical Affairs.

T4.21 Industrial wastewater treatment plants in operation, by State, 2007

	State	Number of plants in operation	Capacity installed (m³/s)	Flow treated (m³/s)
1	Aguascalientes	46	0.23	0.11
2	Baja California	174	0.44	0.15
3	Baja California Sur	7	0.01	0.01
4	Campeche	49	0.49	0.16
5	Coahuila de Zaragoza	70	0.95	0.64
6	Colima	8	0.44	0.31
7	Chiapas	18	0.69	0.69
8	Chihuahua	20	0.66	0.29
9	Federal Distrit	123	0.41	0.41
10	Durango	33	0.68	0.34
11	Guanajuato	45	0.40	0.18
12	Guerrero	7	0.05	0.04
13	Hidalgo	41	1.65	0.98
14	Jalisco	33	1.51	1.51
15	State of Mexico	292	3.75	2.75
16	Michoacan de Ocampo	45	3.55	2.47

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T4.21 Industrial wastewater treatment plants in operation, by State, 2007

	State	Number of plants in operation	Capacity installed (m³/s)	Flow treated (m³/s)
17	Morelos	80	2.83	2.72
18	Nayarit	4	0.16	0.16
19	Nuevo Leon	83	4.13	3.00
20	Oaxaca	13	1.08	0.76
21	Puebla	97	0.62	0.43
22	Queretaro Arteaga	128	1.11	0.51
23	Quintana Roo	2	0.01	0.01
24	San Luis Potosi	74	1.36	0.63
25	Sinaloa	42	2.82	0.46
26	Sonora	23	0.36	0.16
27	Tabasco	108	0.61	0.15
28	Tamaulipas	46	1.60	0.83
29	Tlaxcala	107	0.30	0.26
30	Veracruz de Ignacio de la Llave	160	11.63	8.64
31	Yucatan	36	0.11	0.07
32	Zacatecas	7	0.15	0.04
Total		**2 021**	**44.79**	**29.87**

SOURCE: CONAGUA. Deputy Director General's Office for Technical Affairs.

T4.22 Types of industrial wastewater treatment, 2007

Type of treatment	Purpose	No. of plants	Flow (m^3/s)	Percentage
Primary	Adjusting the pH and removing organic material, and/or inorganic materials in suspension with a size equal to or greater than 0.1 mm	589	10.63	35.6
Inorganic in suspension with a size equal to or more than 0.1 mm				
Secondary	Removing colloidal and dissolved organic materials	1 119	15.09	50.5
Tertiary	Removing dissolved materials that include gases, natural and synthetic organic substances, ions, bacteria and viruses	59	0.64	2.1
Not specified		254	3.51	11.8
Total		**2 021**	**29.87**	**100.0**

SOURCE: CONAGUA. Deputy Director General's Office for Technical Affairs.

Wastewater reuse

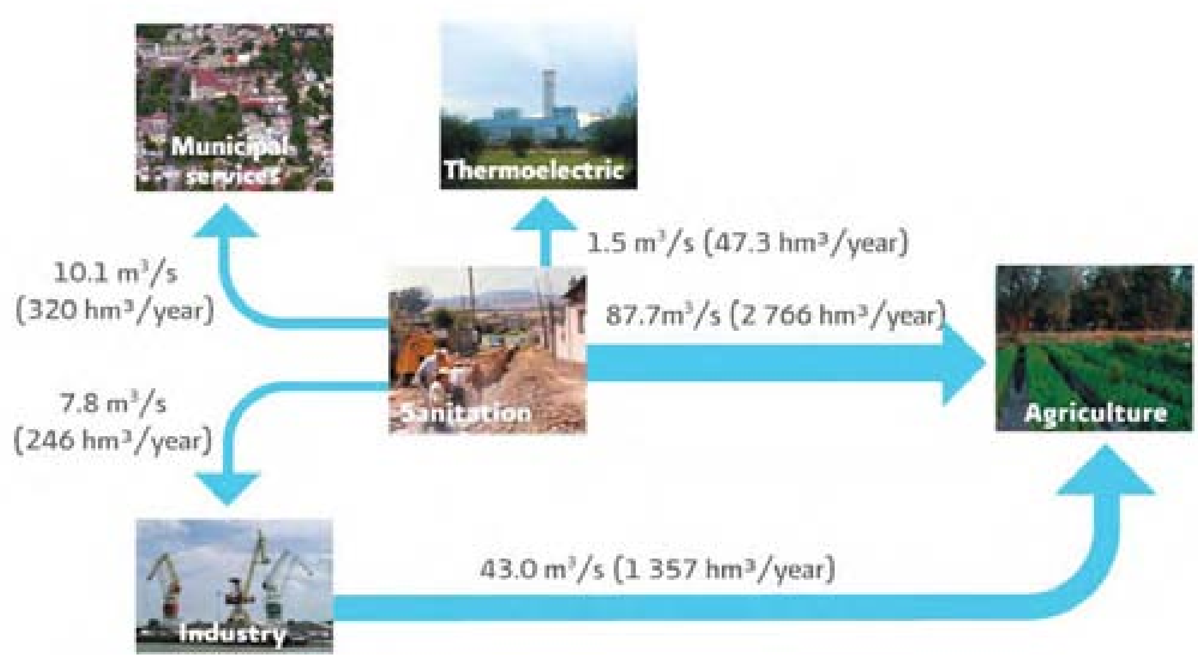
It is estimated that in Mexico in 2007, 4 722 million cubic meters of water were reused (equivalent to a flow of 150 m^3/s).

In the reuse of water of municipal origin, the transfer of wastewater collected in sewerage networks to agricultural crops stands out. To a lesser degree wastewater is also used in industry, as well as thermoelectric stations, as is the case in the Villa de Reyes thermoelectric station in San Luis Potosi.

In the reuse of industrial wastewater (non municipal), the wastewater used by the sugar industry in growing sugar cane in the state of Veracruz stands out.

In the following figure the different transfers of water between uses can be identified.

G4.11 Reuse of municipal and non-municipal wastewater, 2007



NOTE: m^3/s = cubic meters per second, 1 hm^3/year= 1 million m^3 per year.
1 m^3/s = 31.536 hm^3/year
SOURCE: CONAGUA. Estimations of the Deputy Director General's Office for Planning based on data from the Deputy Director General's Office for Technical Affairs.

4.6 Emergency Attention

The CONAGUA has set up 13 Regional Emergency Attention Centers (CRAEs in Spanish) in various areas of the country, with the aim of supporting the states and municipalities in the supply of drinking water and sanitation in situations of risk.

Among the equipment at the disposal of the CRAEs are mobile water treatment plants, pumping equipment, independent electricity plants, pipe trucks and transport equipment for the machinery. This emergency attention is carried out by the CONAGUA in coordination with the states, municipalities and federal dependences.

M4.4 Location of the Regional Emergency Attention Centers (CRAEs), 2007

SOURCE: CONAGUA. Deputy Director General's Office for Planning.
Produced based on data from the General Coordination for Attention to Emergencies and River Basin Councils.

Chapter 5

Water Management Tools

In this chapter, the country's legal, normative, economic financial and consultation tools are presented, which aim to foster a responsible use of water and contribute to its preservation.

This chapter also indicates the investments and budgets in the drinking water, sanitation and sewerage sub-sector, applied by various stakeholders in water management in Mexico. New maps of availability of published groundwater and surface water are included, and on the subject of tariffs, a new section has been added.

Amongst the participation mechanisms, the River Basin Councils are fundamental, so a whole section has been included on them and their auxiliary bodies.

Finally, in several sections the relationship between the CONAGUA and other agencies and institutions is mentioned, as well as the evolution of its budget, among other issues.

5.1 Institutions Related with Water in Mexico

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

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

Vision

To be a technical authority and a promoter of the participation of society and governmental instances in Integrated Water Resources Management and its inherent public goods.

Up to December 2007, the CONAGUA had 14 592 employees, of which 3 965 occupied upper and middle management positions and 10 627 corresponded to staff of the basic and mid-level payroll. 84% of the staff was assigned to the River Basin Organizations and Local Offices and the remaining 16% to the central offices. It is worth adding that the institution's staff has been reduced significantly. In 1989, the year of creation of the CONAGUA, it had 38 188 members of staff whereas in 2000 it had 21 599. It was in this year that the Federal Government's Voluntary Retirement Program commenced, which contributed to the present reduction in staff numbers.

In order to carry out the functions assigned to it, the CONAGUA works in conjunction with various federal, state and municipal instances, as well as water user associations and companies and institutions of the private sector and civil society. The following table shows the main institutions with which it coordinates for the achievement of the goals of the 2007-2012 National Water Program.

According to article 115 of the Constitution of Mexico, municipalities are responsible for providing drinking water, sewerage and sanitation services.

To carry out these tasks, municipalities generally resort to drinking water, sewerage and sanitation utilities.

T5.1 Institutions and organizations with which the National Water Commission coordinates

Institution	Example of the coordination carried out
Ministry of Finance and Public Credit	Defining the annual budget assigned to the institutions related to the water sector and the corresponding calendar of payments, contributing to favoring a flexible and appropriate use of the assigned resources; if applicable, authorizing multi-annual investment programs
Congress of the Union	Agreeing on the policies and budget required for water resources, as well as evaluating and if appropriate approving the requests for modification of the National Water Law and its By-Laws.
States and municipalities	Programs and actions to restore the country's watersheds, support the supply of drinking water and sanitation services to the population, stimulate the efficient use of water in productive activities, such as irrigation and industry, and actions for the attention of meteorological events.
Ministry of Health	Support the municipalities so that their inhabitants receive water suitable to be consumed and foster among the population the habits and customs associated with hygiene that will afford them a better standard of living.

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T5.1 Institutions and organizations with which the National Water Commission coordinates

Institution	Example of the coordination carried out
Ministry of Public Education	Actions aimed at school children to promote the efficient use and preservation of water, including specific sections on taking care of water and the environment in text books.
Ministry of Agriculture, Livestock, Rural Development, Fishing and Food	Actions to promote a more efficient use of water in agriculture and to increase the productivity of agriculture based on the country's food requirements, the type of soil and the availability of water.
Ministry of the Interior	Necessary programs and actions for the prevention and attention of droughts and floods.
Federal Commission for Electricity	Build and operate dams which are used to generate electricity, water supply to cities, irrigation or flood protection.
Ministry of Foreign Affairs	Promote the technical and financial coordination with agencies and institutions of the United States of America to carry out programs associated with the management and preservation of water in the transboundary catchments and aquifers.
Ministry of Tourism	Actions to attain a better use and preservation of water in tourist sites and recreational areas.
Ministry of the Economy	Take part in the formulation of the official standards for the water sector.
National Forestry Commission	Soil and water conservation actions in the upstream parts of catchments, with the aim of decreasing the dragging of solids to riverbeds and dams.
Attorney General's Office for Environmental Protection	Actions to monitor water quality in the country's rivers and lakes and applying the corresponding sanctions.
Mexican Institute for Water Technology	Carry out water-related research and technological actions.
Ministry of Civil Service	Promote actions of good governance and institutional development, coordinate the actions associated with the certification of capacities in the federal civil service.
River Basin Councils and their auxiliary bodies	Take part in the Integrated Water Resources Management of watersheds and aquifers, in such a way that social wellbeing, economic development and the preservation of the environment are favored.
Water Advisory Council	Strategies for a better use and preservation of water.
Research and Technology Institutes	Research and technological development for the preservation of water.
Ministry of Social Development	Support rural communities for the development of drinking water, sewerage and sanitation infrastructure.

SOURCE: CONAGUA, National Water Program 2007-2012, Mexico, 2007.

5.2 Legal Framework for the Use of the Nation's Water

The National Water Law establishes that the use of the nation's waters will be carried out through a concession granted by the Federal Executive Branch, through the CONAGUA, by means of the River Basin Councils, or directly by the CONAGUA when appropriate, according to the rules and conditions disposed within the National Water Law and its By-Laws. Similarly, for wastewater discharges, it is necessary to have a discharge permit issued by the CONAGUA. The concession and discharge permit deeds are recorded in the Public Registry of Water Rights (REPDA), which was established in 1992, with the issuing of the National Water Law.

Deeds registered in the Public Registry of Water Rights

Up to December 2007, 354 238 national water deeds had been registered in the REPDA, corresponding to an assigned volume of 78 950 million cubic meters (hm³) for offstream uses and 161 239 hm³ for instream uses (hydroelectricity). The distribution of these deeds by their use is shown in the following table:

T5.2 Deeds registered in the REPDA

Use	Deeds registered in the REPDA	
	Number	Percentage
Agricultural[a]	208 569	58.88
Public supply[b]	135 846	38.34
Self-supplying industryc[c]	9 720	2.75
Total offstream uses	354 135	99.97
Instream uses (Hydroelectric)	103	0.03
Total	**354 238**	**100.00**

NOTE: One concession deed may cover one or more uses or permits.
[a] Includes the agricultural, livestock, aquaculture, multiple and other headings of the REPDA classification.
[b] Includes the public urban and domestic headings of the REPDA classification.
[c] Includes the industrial, agro-industrial, services and trade headings of the REPDA classification.

SOURCE: CONAGUA. Deputy Director General's Office for Water Management.

T5.3 Deeds registered in the REPDA, by Hydrological-Administrative Region, 2007 (number of deeds)

Hydrological-Administrative Region		Concessions and/or allocations[a]		Discharge permits	Federal zone permits	Material withdrawal
		Surface water	Groundwater			
I	Baja California Peninsula	2 331	9 565	615	1 447	347
II	Northwest	4 593	18 768	644	2 936	66
III	Northern Pacific	12 365	12 508	547	8 699	352
IV	Balsas	15 256	12 414	1 524	8 086	277
V	Southern Pacific	8 472	16 389	322	8 012	225
VI	Rio Bravo	6 467	36 389	573	5 772	52
VII	Central Basins of the North	3 556	26 668	921	3 312	48
VIII	Lerma-Santiago-Pacific	18 443	45 205	2 172	19 233	549
IX	Northern Gulf	7 472	12 557	731	10 277	174
X	Central Gulf	12 100	16 468	1 481	17 643	573
XI	Southern Border	24 249	7 440	638	11 406	152
XII	Yucatan Peninsula	168	21 159	2 699	74	3
XIII	Waters of the Valley of Mexico	1 095	2 141	574	1 571	0
Total		**116 567**	**237 671**	**13 441**	**98 468**	**2 818**

NOTE: [a] One concession deed may cover one or more uses or permits.
SOURCE: CONAGUA. Deputy Director General's Office for Water Management.

Prohibition zones

With the aim of diminishing the overexploitation of the country's aquifers and watersheds, the federal government has issued prohibitions to restrict water withdrawals in various areas.

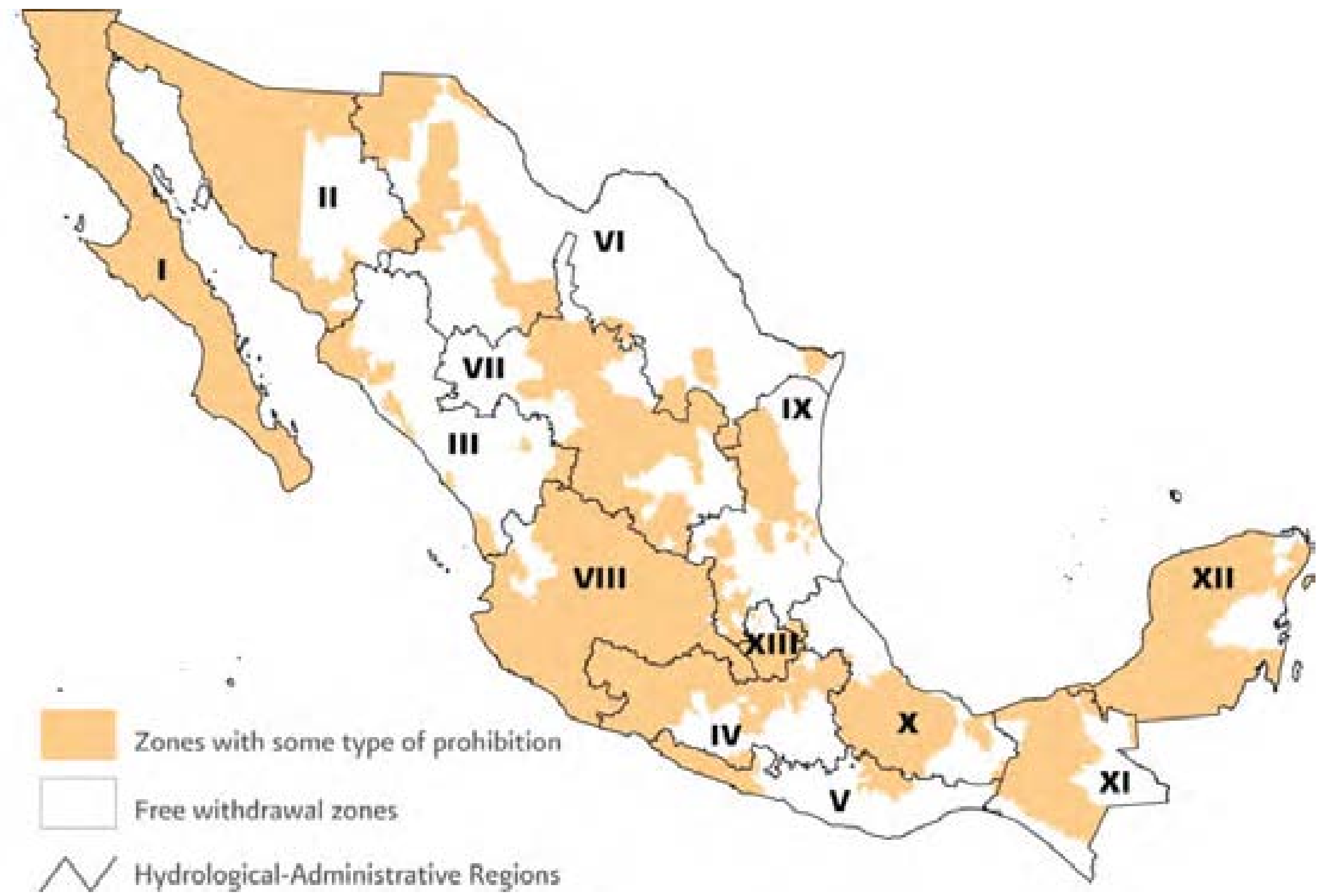
In the case of groundwater, 145 prohibition zones are currently valid, published between 1943 and 2007. In the following figure, the areas of the country with some type of prohibition to restrict groundwater withdrawal are shown.

In the case of surface water, the existing prohibitions are from the years 1929 to 1975.

Publication of mean annual water availabilities

The National Water Law establishes that, in order to grant the concession deeds, the mean annual availability of the watershed or aquifer in which the water will be used will be taken into account. The CONAGUA is bound to publish this availability, and for this purpose the Official Mexican Standard NOM-011-CNA-2000 has been created, "Conservation of water resources – which establishes the specifications and the method to determine the mean annual availability of the nation's waters", in which the methodology to do so is indicated.

M5.1 Prohibition zones for groundwater withdrawal, by Hydrological-Administrative Region, 2007

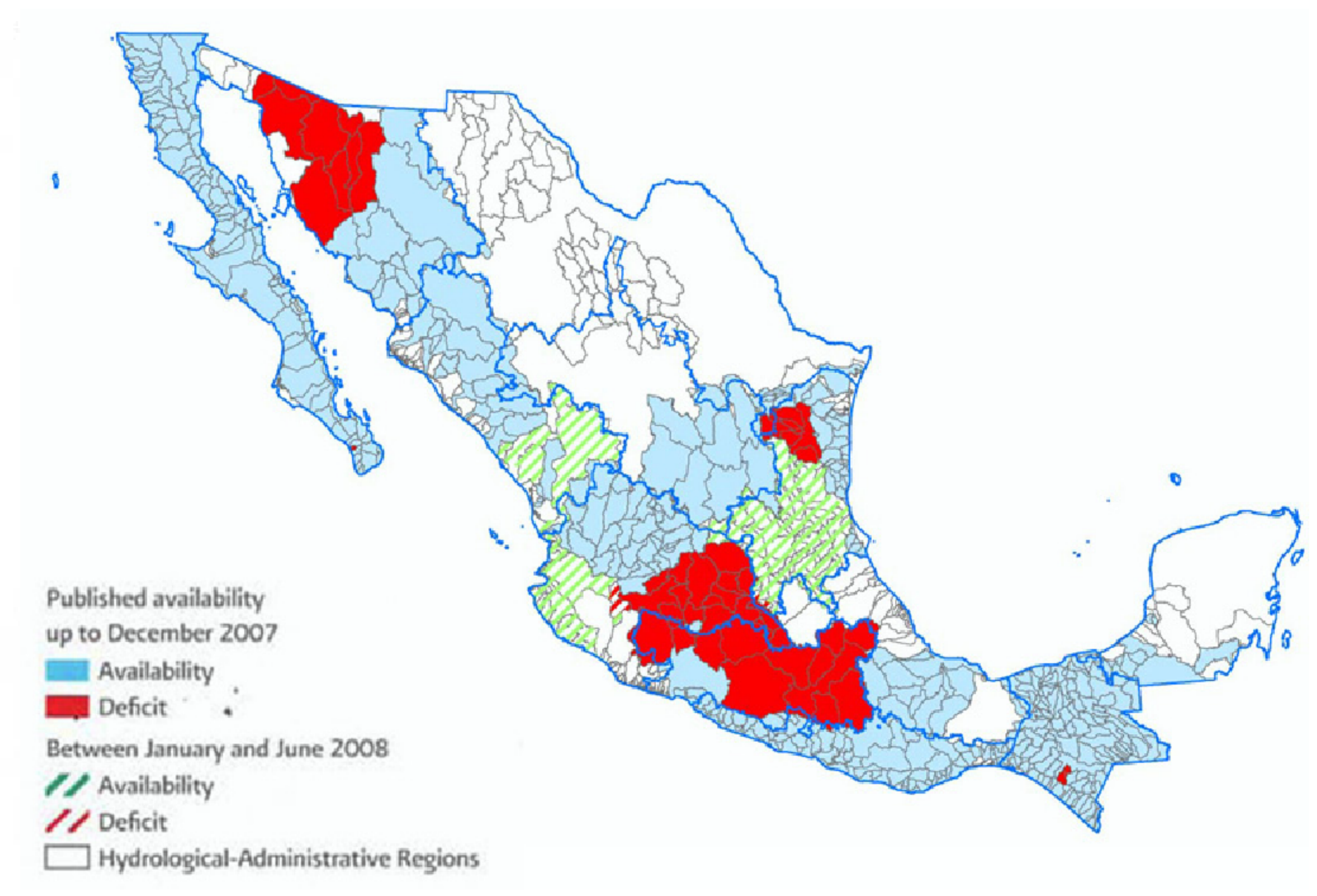


SOURCE: CONAGUA. Deputy Director General's Office for Planning. Produced based on data from the Deputy Director General's Office for Technical Affairs.

Up to December 31st, 2007, the availability of 252 hydrogeological units or aquifers, from which 75% of the country's groundwater is withdrawn, had been published in the Official Government Gazette, as well as that of 480 watersheds. Furthermore, between January 1st and June 30th, 2008, the mean availability of 30 additional aquifers and 113 watersheds was published, bringing the total number of aquifers and watersheds with published availability to 282 and 593 respectively.

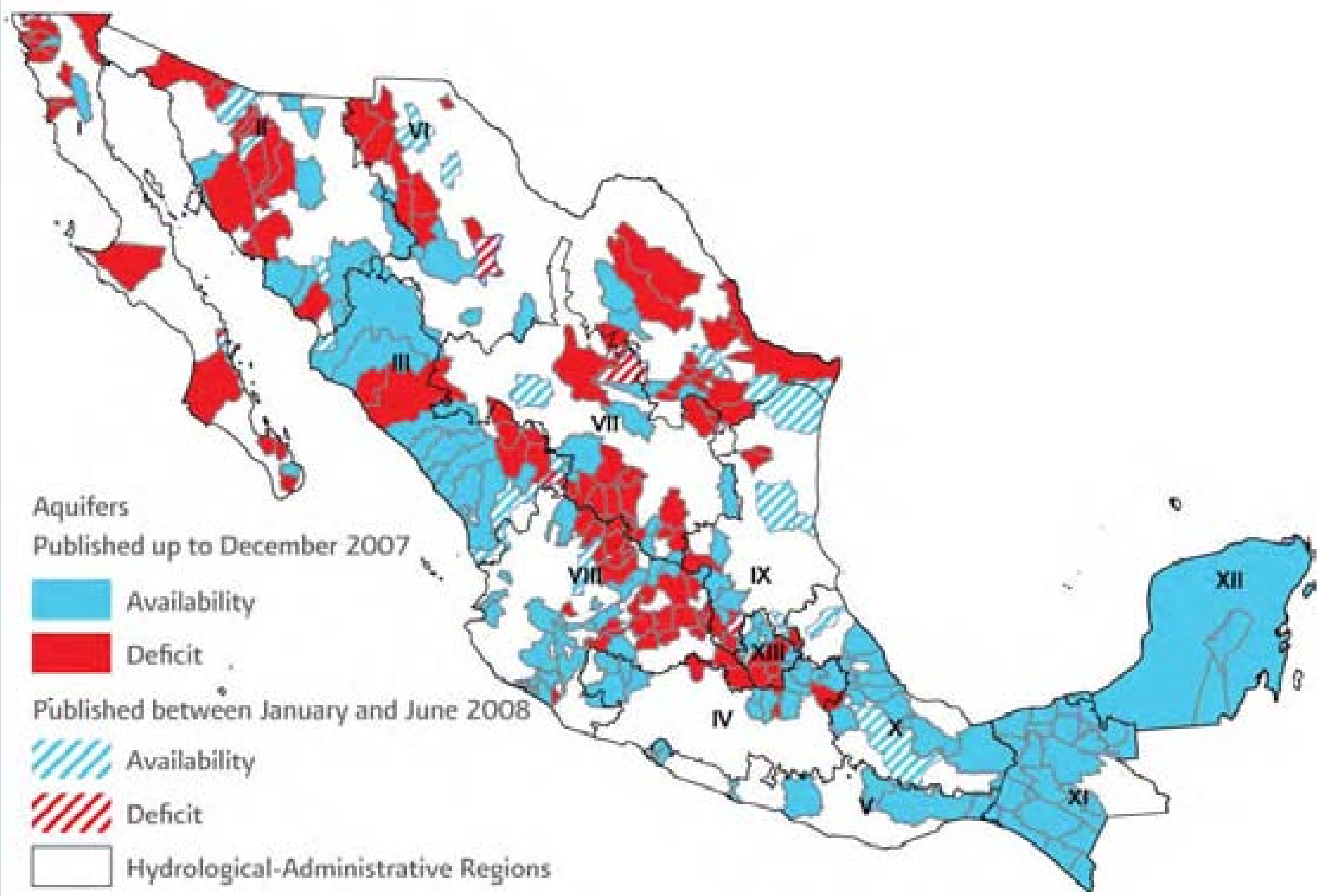
The following maps show the location of the country's watersheds and aquifers with their availability published in the Official Government Gazette up to June 30th, 2008.

M5.2 Watersheds with published availability according to the Official Mexican Standard NOM-011-CNA-2000



SOURCE: CONAGUA. Deputy Director General's Office for Planning. Produced based on data from the Deputy Director General's Office for Technical Affairs.

M5.3 Aquifers with published availability according to the Official Mexican Standard NOM-011-CNA-2000



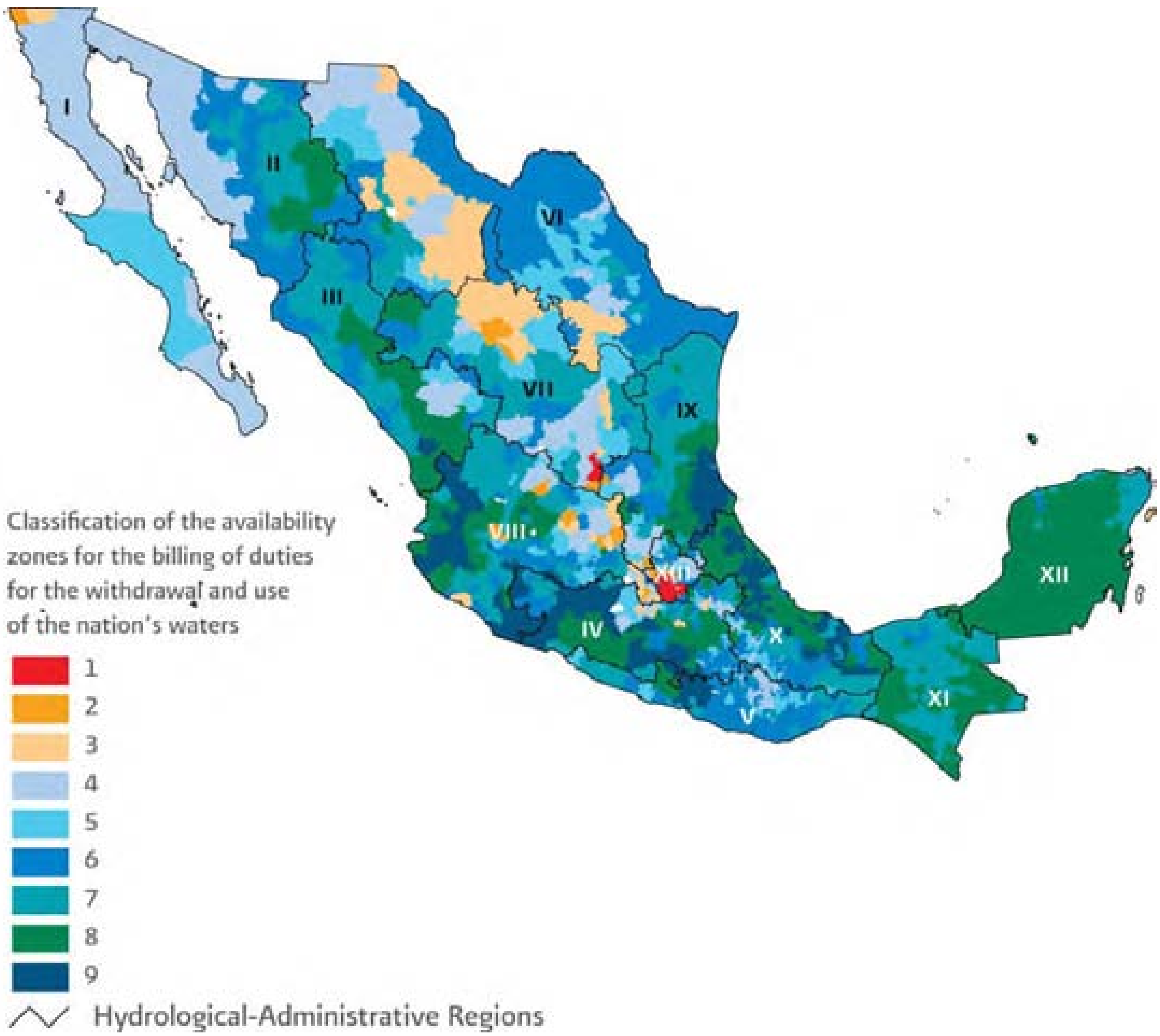
SOURCE: CONAGUA. Deputy Director General's Office for Planning. Produced based on data from the Deputy Director General's Office for Technical Affairs

5.3 Economy and Water Finances

Duties for the use of the nation's waters

In order to charge duties for the use of water, Mexico 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. In general the cost per cubic meter is higher in the zones of lesser availability

M5.4 Availability zones for the billing of duties, by municipality, 2008



NOTE: The duty referred to in this section will be paid on a monthly basis, within the first 17 days of the month immediately after the one corresponding to the payment.

SOURCE: CONAGUA. Deputy Director General's Office for Planning. Produced based on the Federal Duties Law. Mexico, 2008.

T5.4. Duties for the use of the nation's waters, by availability zone, 2008
(Mexican pesos cents per cubic meter)

Use	Availability zone								
	1	2	3	4	5	6	7	8	9
General Regime[a]	1656.65	1325.27	1104.38	911.13	717.83	648.76	488.31	173.49	130.02
Drinking water, consumption more than 300 L/inhabitant/day	65.64	65.64	65.64	65.64	65.64	65.64	30.56	15.26	7.60
Drinking water, consumption equal to or less than 300 L/inhabitant/day	32.82	32.82	32.82	32.82	32.82	32.82	15.28	7.63	3.80
Agricultural, without exceeding the assigned volume	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Agricultural, for every m^3 that it exceeds the assigned volume	11.73	11.73	11.73	11.73	11.73	11.73	11.73	11.73	11.73
Spas and recreational centers	0.94	0.94	0.94	0.94	0.94	0.94	0.46	0.22	0.10
Generation of hydropower	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
Aquaculture	0.27	0.27	0.27	0.27	0.27	0.27	0.13	0.06	0.03

NOTE: No payment is made for the withdrawal of seawater, or for brackish water with concentrations of more than 2 500 mg/L of total dissolved solids (when certified by the CONAGUA). The duty referred to in this section will be paid on a monthly basis, within the first 17 days of the month immediately after the one corresponding to the payment.
[a] Refers to any use other than those mentioned.
SOURCE: CONAGUA. Deputy Director General's Office for Planning. Produced based on the Federal Duties Law. Mexico, 2008.

T5.5 Duties for material withdrawal, 2008
(Mexican pesos per cubic meter)

Material	Zone 1	Zone 2
Gravel	15.81	10.16
Sand	15.81	10.16
Clay and mud	12.42	7.91
Raw material	12.42	7.91
Stone	13.55	9.03
Others	5.65	3.39

NOTE: Zone 1 includes the states of Baja California, Guanajuato, Sinaloa, Sonora, Tabasco, Veracruz de Ignacio de la Llave and Zacatecas.
Zone 2 includes the states not included in zone 1 and the Federal District.
SOURCE: CONAGUA. Federal Duties Law. Mexico, 2008.

For the billing of duties for wastewater discharges, the receiver bodies (rivers, lakes, lagoons, etc.) are classified into three types: A, B or C, according to the effects caused by the pollution, the C-type receiver bodies being those in which the pollution has the strongest effects. The list of the receiver bodies that belong to each category can be found in the Federal Duties Law for water resources.

The wastewater discharge duties are related to the volume of the discharge and the load of the pollutants and may be consulted in article 278C of the Federal Duties Law.

Revenues of the CONAGUA

In the following figure, we may observe the CONAGUA's revenues for the billing of duties, which includes the following concepts: use of the nation's waters; use of receiver bodies; material withdrawal; block water supply to urban and industrial centers; irrigation services; use of federal zones; and various, such as transaction services, VAT and fines, among others.

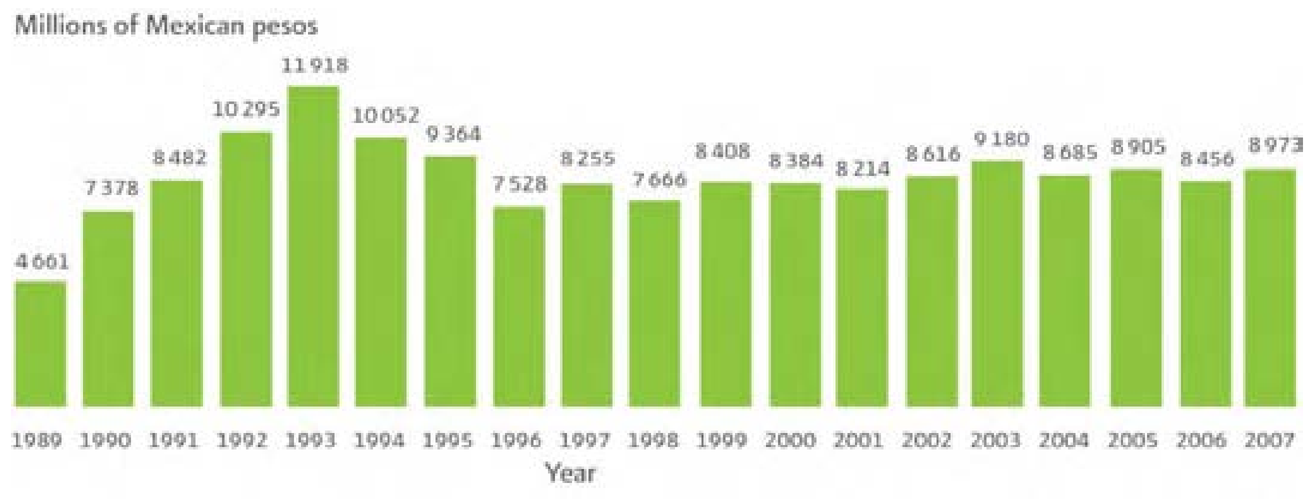
T5.6 Revenues of the CONAGUA for the billing of duties by concept, annual series from 1999 to 2007
(millions of Mexican pesos at constant 2007 prices)

Concept	1999	2000	2001	2002	2003	2004	2005	2006	2007
Use of the nation's waters	6 326.0	6 634.4	6 434.2	6 907.1	7 436.2	7 043.3	7 059.5	6 673.2	7 114.3
Block water supply to urban and industrial centers	1 395.6	1 185.0	1 204.1	1 167.9	1 331.5	1 250.2	1 476.7	1 369.9	1 446.8
Irrigation	153.7	151.8	173.9	174.6	159.2	162.3	166.5	159.4	189.9
Material withdrawal	40.6	41.9	45.3	35.0	31.5	40.0	36.7	54.3	36.3
Wastewater discharges	49.0	46.1	82.4	64.1	74.1	73.0	55.5	50.3	57.2
Use of federal zones	21.4	26.5	25.6	25.6	27.3	34.9	29.3	27.6	34.3
Various (transaction services, VAT and fines, among others)	422.1	298.4	248.9	241.7	120.2	81.1	81.2	121.1	93.8
Total	**8 408.4**	**8 384.1**	**8 214.4**	**8 616.0**	**9 180.0**	**8 684.8**	**8 905.4**	**8 455.8**	**8 972.6**

NOTES: The sums may not add up precisely due to the rounding up or down of figures.
The conversion of pesos at current prices to constant 2007 prices was carried out based on the average National Consumer Price Index for each year.
SOURCE: CONAGUA. Deputy Director General's Office for Water Management.

It is worth mentioning that the payment of duties for wastewater discharges (use of receiver bodies) is the equivalent of 0.6% of the total revenues, even though the level of treatment is still very low.

G5.1 Revenues of the CONAGUA for the billing of duties, annual series from 1989 to 2007
(millions of Mexican pesos at constant 2007 prices)



SOURCE: CONAGUA. Deputy Director General's Office for Water Management.

T5.7 Revenues of the CONAGUA, by Hydrological-Administrative Region, 2007
(millions of Mexican pesos at constant 2007 prices)

Hydrological-Administrative Region	Concept							Total
	Use of the nation's waters	Block water supply to urban and industrial centers	Irrigation	Material withdrawal	Wastewater discharges	Use of federal zones	Various (transaction services, VAT and fines, among others)	
I Baja California Peninsula	125.8	0.0	51.3	9.9	1.1	3.6	4.8	196.5
II Northwest	443.0	0.0	26.8	1.4	1.3	0.5	2.8	475.8
III Northern Pacific	182.7	0.0	48.5	8.4	1.0	2.0	2.7	245.3
IV Balsas	512.3	1.0	3.6	0.5	1.3	2.1	4.3	525.1
V Southern Pacific	156.6	0.0	1.3	2.2	0.2	0.6	2.0	162.9
VI Rio Bravo	1 034.9	0.0	15.6	0.4	4.7	6.6	4.9	1 067.1
VII Central Basins of the North	499.4	0.0	13.3	2.4	1.6	1.0	2.0	519.7
VIII Lerma-Santiago-Pacific	1 604.3	0.0	10.4	4.0	29.2	5.9	20.9	1 674.7
IX Northern Gulf	335.9	0.0	8.1	0.4	2.4	3.9	7.9	358.6
X Central Gulf	392.6	47.7	2.9	0.6	5.6	0.7	13.8	463.9
XI Southern Border	232.5	0.0	0.2	6.0	2.4	1.0	1.8	243.9
XII Yucatan Peninsula	131.9	0.0	0.0	0.0	5.8	0.2	4.8	142.7
XIII Waters of the Valley of Mexico	1 462.4	1 398.1	7.9	0.0	0.7	6.2	21.1	2 896.4
Total	**7 114.3**	**1 446.8**	**189.9**	**36.2**	**57.3**	**34.3**	**93.8**	**8 972.6**

NOTE: The sums may not add up precisely due to the rounding up or down of figures.
SOURCE: CONAGUA. Deputy Director General's Office for Water Management.

Nearly 80% of the CONAGUA's revenues correspond to the withdrawal and use of the nation's waters. The following table shows the revenues corresponding to each of the uses indicated in article 223 of the Federal Duties Law for water resources.

T5.8 Revenues for the withdrawal and use of the nation's waters, annual series from 2000 to 2007
(millions of Mexican pesos at constant 2007 prices)

Use	2000	2001	2002	2003	2004	2005	2006	2007
General Regime[a]	5 565.0	5 497.8	5 261.8	5 362.5	4 952.4	4 847.5	4 609.0	4 948.9
Urban public	486.3	459.4	1 205.9	1 722.1	1 683.8	1 802.6	1 589.8	1 710.2
Hydroelectric	558.3	451.1	415.0	349.6	386.7	388.4	453.6	435.2
Spas and recreational centers	24.6	25.5	24.1	1.1	19.8	20.4	20.3	19.5
Aquaculture	0.2	0.5	0.4	0.9	0.6	0.5	0.3	0.5
Total	**6 634.4**	**6 434.3**	**6 907.2**	**7 436.2**	**7 043.3**	**7 059.4**	**6 673.0**	**7 114.3**

NOTES: The sums may not add up precisely due to the rounding up or down of figures.
[a] Refers to any use other than those mentioned.
SOURCE: CONAGUA. Deputy Director General's Office for Water Management.

The volumes declared, meaning the volumes that the users of the nation's waters reported for the period 1999 – 2007, are the following:

T5.9 Volumes declared for the payment of duties, annual series from 2000 to 2007
(millions of cubic meters, hm^3)

Use	2000	2001	2002	2003	2004	2005	2006	2007
General Regime[a]	1 392.2	1 079.1	1 117.7	1 222.6	1 369.3	1 265.2	1 306.3	1 763.9
Urban public	661.5	1 682.1	4 182.5	6 549.6	6 397.5	7 082.6	8 240.1	7 584.4
Hydroelectric	165 842.5	128 848.9	120 982.0	96 163.5	110 581.1	115 385.8	140 294.9	122 831.6
Spas and recreational centers	164.4	128.1	115.5	32.0	80.5	93.8	115.0	83.5
Aquaculture	92.2	192.0	176.5	211.0	285.0	397.1	159.0	307.9
Total	**168 152.8**	**131 930.2**	**126 574.2**	**104 178.7**	**118 713.4**	**124 224.5**	**150 115.3**	**132 571.3**

NOTES: The sums may not add up precisely due to the rounding up or down of figures.
[a] Refers to any use other than those mentioned.
SOURCE: CONAGUA. Deputy Director General's Office for Water Management.

T5.10 Revenues for the withdrawal or use of the nation's waters, by Hydrological-Administrative Region, 2007
(millions of Mexican pesos at constant 2007 prices)

		Use				
Hydrological-Administrative Region	General Regime[a]	Urban public	Hydroelectric	Spas and recreational centers	Aquaculture	Total
I Baja California Peninsula	55.0	70.8	0.0	0.0	0.0	125.8
II Northwest	333.2	98.4	11.3	0.0	0.0	442.9
III Northern Pacific	78.6	65.9	37.9	0.1	0.1	182.6
IV Balsas	291.6	112.5	105.6	2.3	0.3	512.3
V Southern Pacific	102.6	46.9	7.2	0.0	0.0	156.7
VI Rio Bravo	719.1	288.9	26.6	0.3	0.0	1 034.9
VII Central Basins of the North	424.7	74.6	0.0	0.1	0.0	499.4
VIII Lerma-Santiago-Pacific	1 227.2	334.2	36.1	6.8	0.0	1 604.3
IX Northern Gulf	290.3	40.4	5.1	0.1	0.0	335.9
X Central Gulf	305.9	37.9	48.7	0.1	0.0	392.6
XI Southern Border	67.0	8.9	156.5	0.1	0.0	232.5
XII Yucatan Peninsula	106.7	25.2	0.0	0.0	0.0	131.9
XIII Waters of the Valley of Mexico	946.9	505.6	0.1	9.7	0.1	1 462.4
Total	**4 948.8**	**1 710.2**	**435.1**	**19.6**	**0.5**	**7 114.2**

NOTES: The sums may not add up precisely due to the rounding up or down of figures.
[a] Refers to any use other than those mentioned.
SOURCE: CONAGUA. Deputy Director General's Office for Water Management.

T5.11 Volumes declared for the payment of duties for withdrawal or use of the nation's waters, by Hydrological-Administrative Region, 2007

(millions of cubic meters, hm³)

Hydrological-Administrative Region	Use					
	General Regime[a]	Urban public	Hydroelectric	Spas and recreational centers	Aquaculture	Total
I Baja California Peninsula	35.0	429.9	0.0	1.5	2.5	468.9
II Northwest	141.3	408.7	3 350.7	0.3	0.1	3 901.1
III Northern Pacific	27.7	381.4	11 183.9	3.0	19.0	11 615.0
IV Rio Bravo	127.4	724.4	31 099.4	25.2	127.3	32 103.7
V Southern Pacific	20.1	164.5	2 139.6	0.0	0.3	2 324.5
VI Rio Bravo	140.4	832.3	2 889.6	6.1	0.8	3 869.2
VII Central Basins of the North	73.8	342.2	0.0	1.1	2.9	420.0
VIII Lerma-Santiago-Pacific	226.6	1 581.4	10 516.6	30.1	35.9	12 390.6
IX Northern Gulf	153.2	223.7	1 105.3	5.1	51.3	1 538.6
X Central Gulf	411.5	372.9	14 279.1	4.7	51.4	15 119.6
XI Southern Border	74.0	234.8	46 256.8	0.1	4.2	46 569.9
XII Yucatan Peninsula	185.1	198.5	0.0	0.1	0.0	383.7
XIII Waters of the Valley of Mexico	147.8	1 689.7	10.6	6.2	12.2	1 866.5
Total	**1 763.9**	**7 584.4**	**122 831.6**	**83.5**	**307.9**	**132 571.3**

NOTES: The sums may not add up precisely due to the rounding up or down of figures.
[a] Refers to any use other than those mentioned.
SOURCE: CONAGUA. Deputy Director General's Office for Water Management.

Budget of the CONAGUA

The budget authorized to the CONAGUA by the Chamber of Deputies for 2008 was 29 442 million Mexican pesos, of which 3 243 million pesos corresponds to staff services and 26 199 million pesos to the concepts of material and supplies, services, real estate, compensation, public works and related services.

G5.2 Expenditure budget, authorized original, 2008

SOURCE: CONAGUA. Deputy Director General's Office for Administration.

G5.3 Evolution of the CONAGUA's exercised budget, annual series from 1997 to 2007

(millions of Mexican pesos)

NOTE: The conversion of Mexican pesos at current prices to constant 2007 prices was carried out based on the average National Consumer Price Index from January to December for each year.
SOURCE: CONAGUA. Deputy Director General's Office for Administration.

T5.12 Investments by heading in the drinking water, sewerage and sanitation sub-sector

(millions of Mexican pesos at constant 2006 prices)

Year	Drinking water	Sewerage	Sanitation	Improving efficiency	Others[a]	Total
2002	4 747	5 378	2 038	1 592	109	13 864
2003	6 298	5 997	1 470	1 137	214	15 116
2004	5 978	6 078	1 595	1 211	79	14 941
2005	8 697	8 537	3 385	1 651	122	22 392
2006	5 445	5 823	1 821	2 393	246	15 728

NOTE: [a] Others: studies, projects and supervision.
SOURCE: CONAGUA. Deputy Director General's Office for Drinking water, Sewerage and Sanitation.

T5.13 Investment by program and origin of the resources, 2006
(millions of Mexican pesos)

Concept / Source	Federal	State	Municipal	Credit/Private initiative/ others	Total
The CONAGUA's Investments	5 152.7	2 514.0	2 542.7	916.4	11 125.8
Drinking Water and Sanitation in Urban Zones	2 208.3	2 016.1	1 002.3	498.9	5 725.6
Valley of Mexico[a]	418.9	0.0	0.0	0.0	418.9
Duty Returns	1 495.8	0.0	1 495.8	0.0	2 991.6
Clean Water	29.0	35.0	0.0	0.0	64.0
PROSSAPYS[b]	822.0	462.9	19.1	0.0	1 303.9
PROMAGUA[b]	178.7	0.0	25.5	417.5	621.7
Other agencies	618.6	185.3	274.7	3 524.2	4 602.8
SEDESOL	346.9	131.4	224.2	27.4	729.9
CONAVI	0.0	0.0	0.0	3 496.7	5 691.0
CDI	271.7	53.9	50.5	0.1	564.0
Total	**5 771.3**	**2 699.3**	**2 817.4**	**4 440.6**	**15 728.6**

NOTES: The sums may not add up precisely due to the rounding up or down of figures.
[a] Resources of the 1928 Fund, with contributions from the Government of the Federal District and on behalf of the state of Mexico.
[b] The state investment includes the municipal resources.
SOURCE: CONAGUA. Deputy Director General's Office for Drinking water, Sewerage and Sanitation.
Contributions from other agencies: SEDESOL, BANOBRAS, CONAVI, CDI and service providers.

Water tariffs

Drinking water tariffs are set differently for each municipality, depending on the provisions of each state's legislation. In some states, the tariffs are approved by the local State Congress, whereas in others they are approved by the government body or Board of Governors of the municipality's or locality's drinking water utility or the State Water Commission.

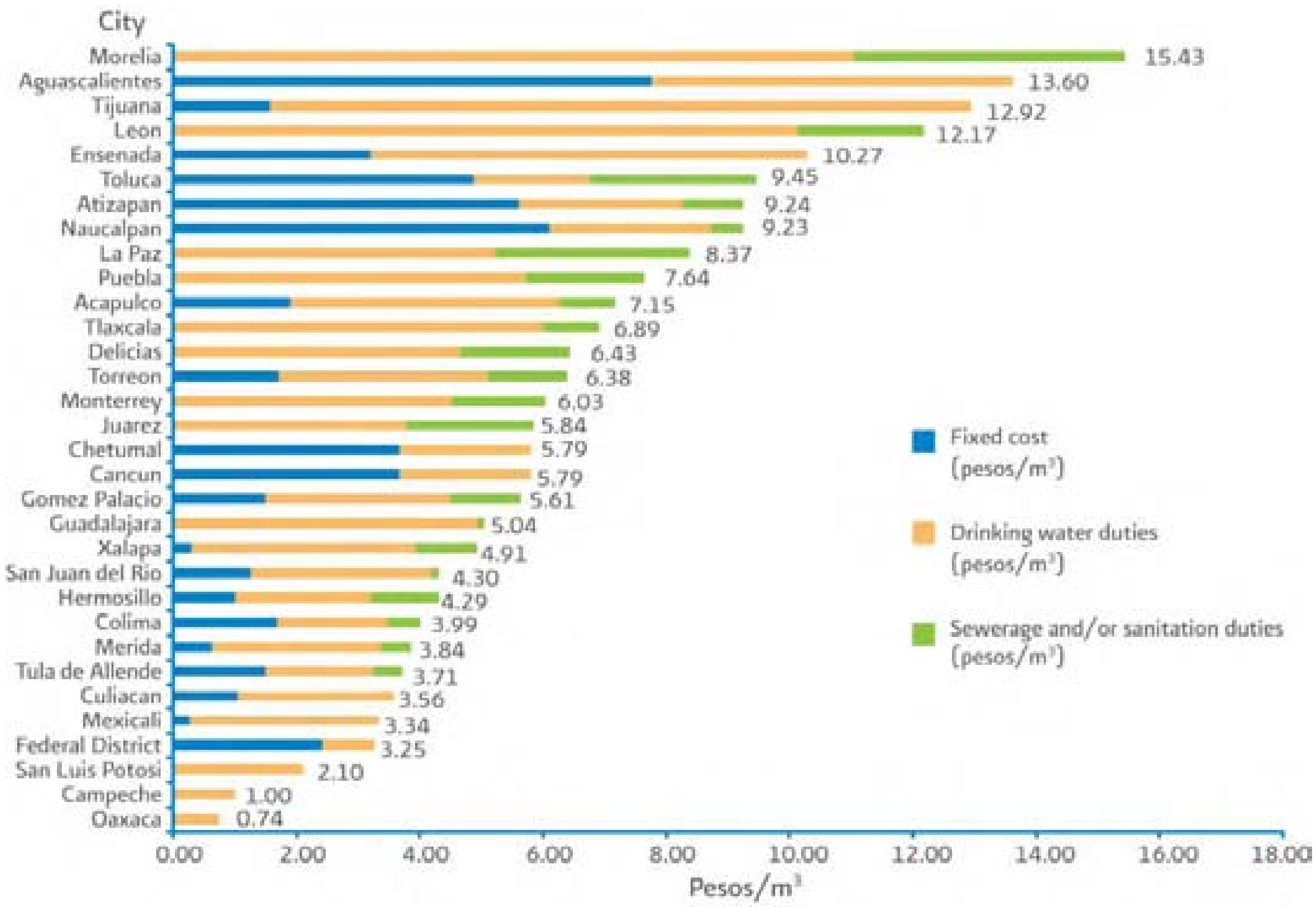
In general the tariffs are different for domestic users and companies or industries and are generally based on progressive tariff blocks, meaning that the price per cubic meter is higher for greater water consumption.

Water tariffs generally include:

- Fixed costs, independent from the volume used,
- Costs for the water supplied, associated with the volume used,
- Costs for sewerage and wastewater treatment, generally applied as a percentage of the costs for water supply,
- Taxes (non-existent in the case of State of Mexico)

The following figure shows the drinking water, sewerage and/or sanitation tariffs per cubic meter for some cities in Mexico, for domestic use with a consumption of 30 m³/month and with the highest applicable tariff.

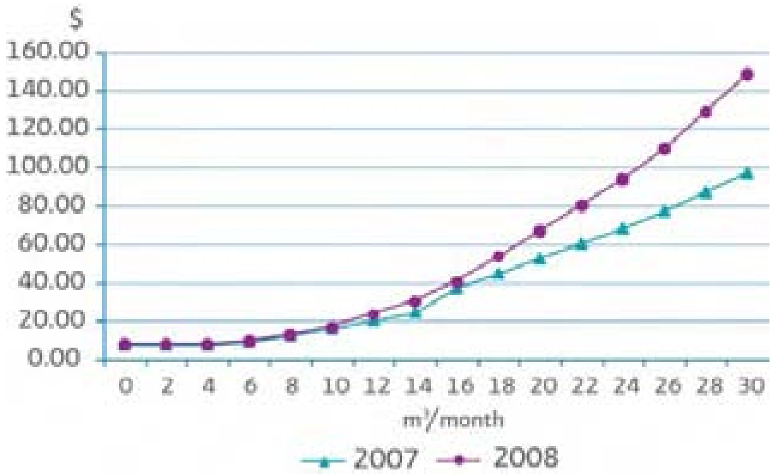
G5.4 Domestic drinking water, sewerage and/or sanitation tariffs in selected cities, 2007
(Mexican pesos/m³)



NOTE: The highest applicable tariff for a consumption of 30 m³/month.
SOURCE: CONAGUA. Deputy Director General's Office for Drinking water, Sewerage and Sanitation.

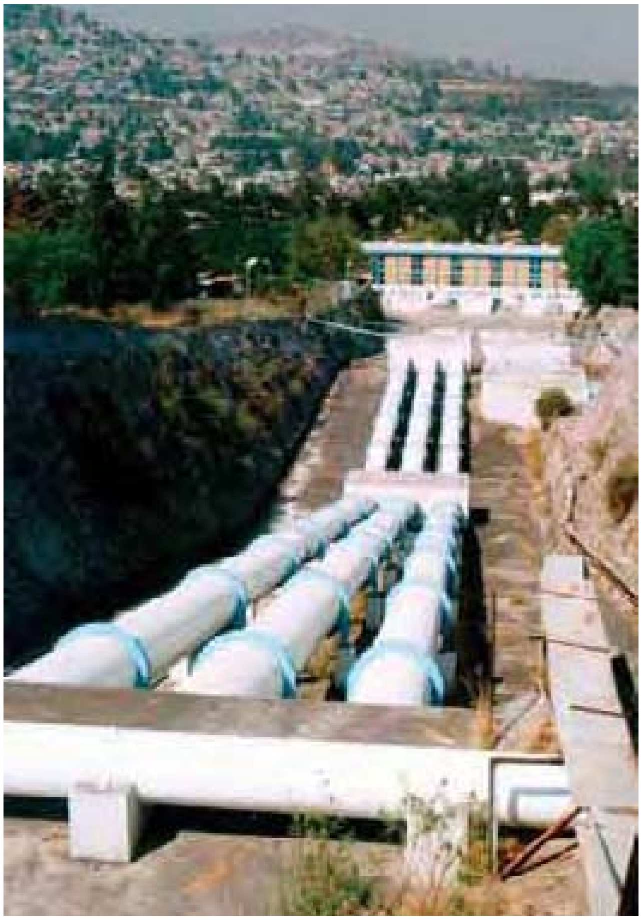
The following figure shows the tariff structure for domestic use in the Federal District. As may be observed, the tariff per cubic meter is higher when the consumption is higher. Similarly, the tariff increases for 2008 were higher for the upper levels.

G5.5 Water tariffs in the Federal District for domestic use
(Current Mexican pesos)

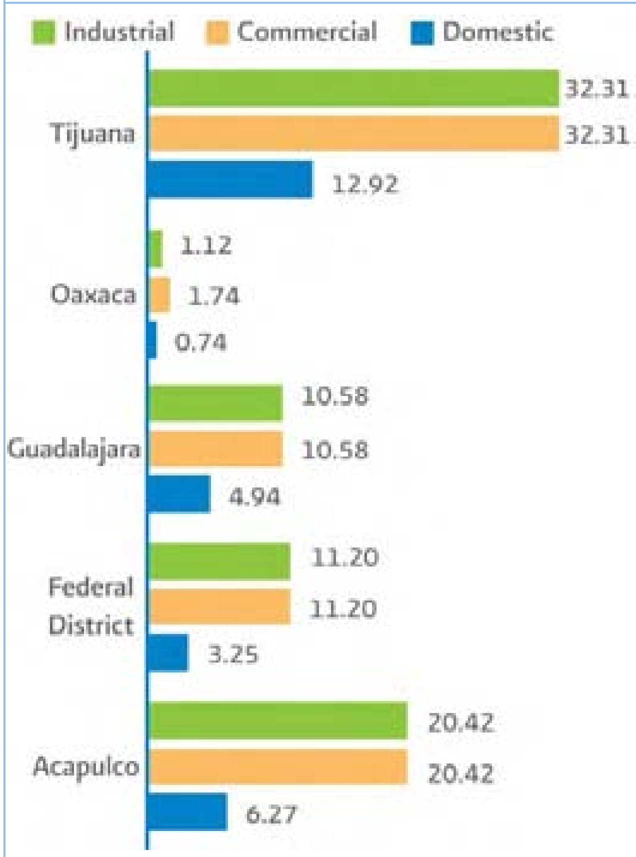


NOTE: The tariff structure is bi-monthly and was converted to cubic meters per month.
SOURCE: Financial Code of the Federal District, 2007 and 2008.
Published on December 30th, 2006 and December 27th, 2007 in the Official Gazette of the Federal District.

In the figure G5.6, the tariffs for domestic, industrial and commercial use are shown, in several localities in Mexico, assuming a consumption of 30 m³/month.



G5.6 Comparison of tariffs for domestic, industrial and commercial use in selected cities, 2007
(Mexican pesos/m³)



NOTE: The highest applicable tariff for a consumption of 30 m³/month.
SOURCE: CONAGUA. Deputy Director General's Office for Drinking water, Sewerage, and Sanitation.

5.4 Participation Mechanisms

River Basin Councils and auxiliary bodies

The National Water Law establishes that the River Basin Councils are collegiate entities of mixed membership, and will be coordination bodies providing support, consultation and advice, between the CONAGUA, including the corresponding River Basin Organization, and the dependencies and entities of the federal, state or municipal instances and the representatives of the waters users and of civil society organizations, from the respective watershed or hydrological region.

Up to December 31st, 2007, 25 River Basin Councils had been established, with the Council referred to as Central Pacific Coast yet to be established. The location of these River Basin Councils is shown in the following figure:

M5.5 Location of the River Basin Councils, by Hydrological-Administrative Region, 2007

SOURCE: CONAGUA. Deputy Director General's Office for Planning.
Produced based on data from the General Coordination for Attention to Emergencies and River Basin Councils.

T5.14 Characteristics of the River Basin Councils, 2007

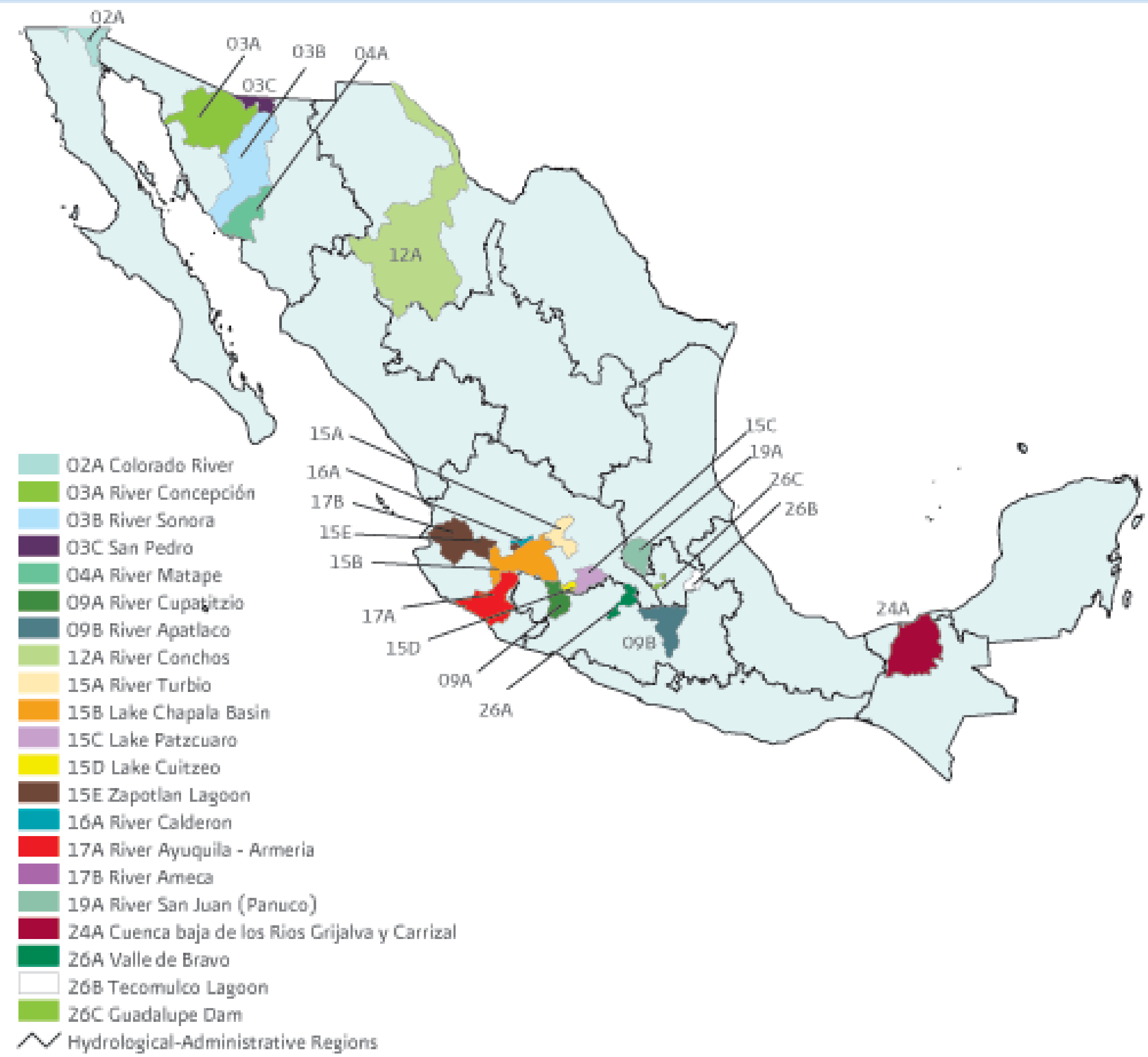
(situation up to December 31st)

No.	Code	River Basin Council	Date of establishment	Hydrological-Administrative Region	
1	01	Baja California Sur	Mar 03rd, 00	I	Baja California Peninsula
2	02	Baja California	Dec 07th, 99	I	Baja California Peninsula
3	03	Upper Northwest	Mar 19th, 99	II	Northwest
4	04	Rivers Yaqui and Matape	Aug 30th, 00	II	Northwest
5	05	River Mayo	Aug 30th, 00	II	Northwest
6	06	Rivers Fuerte and Sinaloa	Dec 10th, 99	III	Northern Pacific
7	07	Rivers Mocorito to Quelita	Dec 10th, 99	III	Northern Pacific
8	08	Rivers Presidio to San Pedro	Jun 15th, 00	III	Northern Pacific
9	09	River Balsas	Mar 26th, 99	IV	Balsas
10	10	Guerrero Coast	Mar 29th, 00	V	Southern Pacific
11	11	Oaxaca Coast	Apr 07th, 99	V	Southern Pacific
12	12	Rio Bravo	Jan 21st, 99	VI	Rio Bravo
13	13	Nazas-Aguanaval	Dec 01st, 98	VII	Central Basins of the North
14	14	Altiplano	Nov 23th, 99	VII	Central Basins of the North
15	15	Lerma-Chapala	Jan 28th, 93	VIII	Lerma-Santiago-Pacific
16	16	Santiago River	Jul 14th, 99	VIII	Lerma-Santiago-Pacific
17	18	Rivers San Fernando-Soto La Marina	Aug 26th, 99	IX	Northern Gulf
18	19	River Panuco	Aug 26th, 99	IX	Northern Gulf
19	20	Rivers Tuxpan to Jamapa	Sep 12th, 00	X	Central Gulf
20	21	River Papaloapan	Jun 16th, 00	X	Central Gulf
21	22	River Coatzacoalcos	Jun 16th, 00	X	Central Gulf
22	23	Chiapas Coast	Jan 26th, 00	XI	Southern Border
23	24	Rivers Grijalva and Usumacinta	Aug 11th, 00	XI	Southern Border
24	25	Yucatan Peninsula	Dec 14th, 99	XII	Yucatan Peninsula
25	26	Valley of Mexico	Nov 11th, 96	XIII	Waters of the Valley of Mexico

SOURCE: CONAGUA. General Coordination for Attention to Emergencies and River Basin Councils.

In the process of consolidation of the River Basin Councils, it was necessary to attend very specific problems in more localized geographic zones, as a result of which River Basin Commissions were created to attend sub-basins, River Basin Committees for micro-basins, Technical Groundwater Committees for aquifers and Clean Beach Committees in the country's coastal zones.

M5.6 Location of the River Basin Commissions by Hydrological-Administrative Region, 2007



SOURCE: CONAGUA. General Coordination for Attention to Emergencies and River Basin Councils.

T5.15 Characteristics of the River Basin Commissions, 2007

No.	Code	River Basin Commission	Date of establishment	Hydrological-Administrative Region
1	02A	Colorado River	Dec 07th, 99	I Baja California Peninsula
2	03A	River Concepción	Sep 29th, 04	II Northwest
3	03B	River Sonora	Dec 14th, 04	II Northwest
4	03C	San Pedro	Oct 24th, 07	II Northwest
5	04A	River Matape	Feb 17th, 04	II Northwest
6	09A	River Cupatitzio	Aug 04th, 04	IV Balsas
7	09B	River Apatlaco	Sep 12th,07	IV Balsas
8	12A	River Conchos	Jan 21st, 99	VI Rio Bravo
9	15A	River Turbio	Jun 15th, 07	VIII Lerma-Santiago-Pacific
10	15B	Lake Chapala Basin	Sep 02nd, 98	VIII Lerma-Santiago-Pacific
11	15C	Lake Patzcuaro	May 18th, 04	VIII Lerma-Santiago-Pacific
12	15D	Lake Cuitzeo	Aug 18th, 06	VIII Lerma-Santiago-Pacific
13	15E	Zapotlan Lagoon	May 30th, 07	VIII Lerma-Santiago-Pacific
14	16A	River Calderon	Feb 28th, 06	VIII Lerma-Santiago-Pacific
15	17A	Ayuquila-Armería	Oct 15th, 98	VIII Lerma-Santiago-Pacific
16	17B	River Ameca	Aug 09th, 04	VIII Lerma-Santiago-Pacific
17	19A	River San Juan (Panuco)	Aug 01st, 97	IX Northern Gulf
18	24A	Lower Basin of the Rivers Grijalva and Carrizal	Oct 26th, 07	XI Southern Border
19	26A	Valle de Bravo	Oct 16th, 03	XIII Waters of the Valley of Mexico
20	26B	Tecocomulco Lagoon	Jul 14th, 05	XIII Waters of the Valley of Mexico
21	26C	Guadalupe Dam	Jan 11th, 06	XIII Waters of the Valley of Mexico

SOURCE: CONAGUA. General Coordination for Attention to Emergencies and River Basin Councils.

In the following figure and table, the location of the 25 River Basin Committees established nationwide is shown:

M5.7 Location of the River Basin Committees by Hydrological-Administrative Region, 2007
(situation up to December 31st)

SOURCE: CONAGUA. General Coordination for Attention to Emergencies and River Basin Councils.

T.5.16 Characteristics of the River Basin Committees, 2007

No.	Code	River Basin Committee	Date of establishment	State	Hydrological-Administrative Region
1	10a	River Huacapa–River Azul	Aug 01st, 03	Guerrero	V Southern Pacific
2	10b	River la Sabana-Tres Palos Lagoon	Dec 11th, 03	Guerrero	V Southern Pacific
3	10c	Coyuca Lagoon-Mitla Lagoon	Sep 27th, 07	Guerrero	V Southern Pacific
4	11a	River Los Perros	Nov 18th, 99	Oaxaca	V Southern Pacific
5	11b	River Salado	May 18th, 01	Oaxaca	V Southern Pacific
6	11c	River Copalita	Apr 19th, 02	Oaxaca	V Southern Pacific
7	11d	River Atoyac	Aug 07th, 02	Oaxaca	V Southern Pacific
8	11e	River Verde	Jun 10th, 04	Oaxaca	V Southern Pacific
9	11f	River Tonameca	Aug 20th, 04	Oaxaca	V Southern Pacific
10	11g	River Tehuantepec	Dec 06th, 05	Oaxaca	V Southern Pacific
11	12a	Central Region of the State of Coahuila	Nov 22nd, 05	Coahuila de Zaragoza	VI Rio Bravo
12	13a	Parras-Paila	Jun 27th, 07	Coahuila de Zaragoza	VII Central Basins of the North
13	19a	River Valles	Dec 10th, 02	San Luis Potosi	IX Northern Gulf
14	21a	River Blanco	Jun 16th, 00	Veracruz de Ignacio de la Llave	X Central Gulf
15	23a	River Zanatenco	Aug 23th, 02	Chiapas	XI Southern Border
16	23b	River Lagartero	Sep 11th, 03	Chiapas	XI Southern Border
17	23c	River Coapa	Oct 15th, 03	Chiapas	XI Southern Border
18	23d	River Coatan	Aug 31st, 05	Chiapas	XI Southern Border
19	24a	River Sabinal	Mar 22nd, 03	Chiapas	XI Southern Border
20	24b	River Cuxtepec	May 02nd, 03	Chiapas	XI Southern Border
21	24c	Montebello Lagoons	Apr 20th, 06	Chiapas	XI Southern Border
22	24d	Catazaja Lagoon	Jun 05th, 06	Chiapas	XI Southern Border
23	24e	River San Pedro-Missicab	Nov 17th, 06	Tabasco	XI Southern Border
24	24f	Valley of Jovel	Jun 05th, 07	Chiapas	XI Southern Border
25	26a	Cañada de Madero	Jun 30th, 00	Hidalgo	XIII Waters of the Valley of Mexico

SOURCE: CONAGUA. General Coordination for Attention to Emergencies and River Basin Councils.

Technical Groundwater Committees (COTAS)

With the aim of achieving a sustainable use of water in the aquifers of the country, Technical Groundwater Committees (COTAS in Spanish) have been created. Up to December 31st, 2007, 78 COTAS had been created.

A summary of the number of COTAS in each Hydrological-Administrative Region is shown in the table T5.17, as well as a complete list in annex.

T5.17 Technical Groundwater Committees

Hydrological-Administrative Region	Number of COTAS
I Baja California Peninsula	19
II Northwest	5
III Northern Pacific	5
IV Balsas	3
V Southern Pacific	1
VI Rio Bravo	10
VII Central Basins of the North	9
VIII Lerma-Santiago-Pacific	17
IX Northern Gulf	6
X Central Gulf	2
XIII Waters of the Valley of Mexico	1
Total	**78**

SOURCE: CONAGUA. General Coordination for Attention to Emergencies and River Basin Councils.

Clean Beach Committees

The Clean Beach Committees are auxiliary entities of the River Basin Councils, with the aim of promoting the sanitation of beaches and the watersheds and aquifers associated with them, as well as preventing and rectifying pollution to protect and preserve Mexico's beaches, respecting the native ecology and raising the quality and the standard of living of the local population, of tourism and the competitivity of the beaches. Up to December 31st, 2007, 31 Committees had been set up.

T5.18 Characteristics of the Clean Beach Committees, 2007
(situation up to December 31st)

No.	Name	Date of establishment	State	River Basin Council	Hydrological-Administrative Region
1	Ensenada	Jul 22nd, 05	Baja California	Baja California	I Baja California Peninsula
2	Tijuana	May 27th, 04	Baja California	Baja California	I Baja California Peninsula
3	Rosarito	Mar 12th, 04	Baja California	Baja California	I Baja California Peninsula
4	La Paz	Jul 22nd, 03	Baja California Sur	Baja California Sur	I Baja California Peninsula
5	Los Cabos	Oct 17th, 03	Baja California Sur	Baja California Sur	I Baja California Peninsula
6	State of Sonora	Nov 18th, 03	Sonora	Upper Northwest and Yaqui–Matape	II Northwest
7	Municipal Clean Beaches of Puerto Peñasco, Sonora	Mar 03rd, 06	Sonora	Upper Northwest	II Northwest
8	Municipal Clean Beaches of Huatabambo	Mar 02nd, 07	Sonora	River Mayo	II Northwest
9	Bahia de Altata	Feb 27th, 06	Sinaloa	River Mocorito to Quelita	III Northern Pacific
10	Mazatlan City	Jun 27th, 03	Sinaloa	Rivers Presidio to San Pedro	III Northern Pacific
11	Municipality of Lazaro Cardenas Michoacan	Jul 21st, 05	Michoacán de Ocampo	River Balsas	IV Balsas
12	Municipality of Santa Maria Huatulco	Oct 15th, 03	Oaxaca	Oaxaca Coast	V Southern Pacific
13	Puerto Escondido Municipality of San Pedro Mixtepec and Lagoon Complex of Manialtepec Tututepec, Juquila	Mar 26th, 04	Oaxaca	Oaxaca Coast	V Southern Pacific
14	Puerto Angel and Zipolite and Municipality of San Pedro Pochutla	May 24th, 05	Oaxaca	Oaxaca Coast	V Southern Pacific
15	IIxtapa – Zihuatanejo, Municipality of Jose Azueta, Guerrero	Mar 14th, 06	Guerrero	Guerrero Coast	V Southern Pacific
16	Acapulco	Apr 07th, 06	Guerrero	Guerrero Coast	V Southern Pacific
17	Technical Clean Beach Committee of the States of Jalisco and Nayarit	Aug 04th, 03	Jalisco and Nayarit	Central Pacific Coast	VIII Lerma Santiago Pacific
18	Manzanillo, Colima	Jul 11th, 03	Colima	Central Pacific Coast	VIII Lerma Santiago Pacific
19	Panuco in the State of Tamaulipas	Sep 11th, 03	Tamaulipas	River Panuco	IX Northern Gulf
20	Veracruz – Boca del Rio	May 13th, 04	Veracruz de Ignacio de la Llave	Rivers Tuxpan to Jamapa	X Central Gulf
21	Tapachula	Mar 31st, 05	Chiapas	Chiapas Coast	XI Southern Border
22	Tonala	Jul 20th, 05	Chiapas	Chiapas Coast	XI Southern Border
23	Municipal of Centla, Tabasco	Mar 16th, 06	Tabasco	Rivers Grijalva and Usumacinta	XI Southern Border
24	Municipal of Paraiso, Tabasco	Mar 20th, 06	Tabasco	Rivers Grijalva and Usumacinta	XI Southern Border
25	Municipal of Cardenas, Tabasco	Mar 23rd, 07	Tabasco	Rivers Grijalva and Usumacinta	XI Southern Border
26	North Coast of the State of Yucatan	Mar 08th, 05	Yucatán	Yucatan Peninsula	XII Yucatan Peninsula
27	Cancun – Riviera Maya	Aug 28th, 03	Quintana Roo	Yucatan Peninsula	XII Yucatan Peninsula
28	Campeche	Serp 23rd, 04	Campeche	Yucatan Peninsula	XII Yucatan Peninsula

(continues)

(continued)

T5.18 Characteristics of the Clean Beach Committees, 2007
(situation up to December 31st)

No.	Name	Date of establishment	State	River Basin Council	Hydrological-Administrative Region
29	Champoton	Nov 09th, 04	Campeche	Yucatan Peninsula	XII Yucatan Peninsula
30	Mayan Coast of the State of Quintana Roo	Mar 24th, 07	Quintana Roo	Yucatan Peninsula	XII Yucatan Peninsula
31	Playa del Carmen, Campeche	Apr 13rd, 07	Campeche	Yucatan Peninsula	XII Yucatan Peninsula

SOURCE: CONAGUA. General Coordination for Attention to Emergencies and River Basin Councils.

Water Advisory Council

The Water Advisory Council is a civil-society, multi-stakeholder, independent, non-profit organization, created as an association under Mexican law in March 2000.

The Council is integrated by individuals or institutions of an altruistic vocation, recognized for their activities in the academic, civil society and economic sectors, and sensitive to water-related problems and the need to solve them.

The Council's main objective is to promote and support the necessary strategic shift for the rational use and sustainable management of water in Mexico, advising with this aim to public and private sectors and civil society.

The Council has two types of advisors, personal and institutional, according to whether they are individuals or organizations. It currently has 22 advisors, of which 14 are personal and 8 are institutional. The institutional advisors are:

- National Association of Water and Sanitation Utilities of Mexico;
- National Association of Irrigation Users;
- Business Coordination Council;
- Communication Council;
- National Chamber of the Radio and Television Industry;
- National Polytechnic Institute;
- Monterrey Technological and Higher Studies Institute, and
- National Autonomous University of Mexico.

It should be mentioned that the National Water Commission is not a member of the Council, but is invited as a permanent guest.

5.5 Water-Related Standards

Official Mexican Ecological Standards and those of the water sector

In the following, the Mexican environmental standards related to the theme of water are presented. The name of the standards changed from ECOL to SEMARNAT according to the modifications of names specified in the Official Government Gazette on April 23rd, 2003.

NOM-001-Semarnat-1996	Establishes the maximum permissible limits of pollutants in wastewater discharges in national waters and goods. It was published in the Official Government Gazette on January 6th, 1997 and came into effect the following day. This standard was complemented by the clarification published in the same means of communication on April 30th, 1997.

T5.19 Dates of completion of the NOM-001-SEMARNAT-1996

Municipal discharges		
Modified dates of completion from:	Population range (according to the 1990 Census)	Number of localities (according to the 1990 Census)
January 1st, 2000	More than 50 000 inhabitants	139
January 1st, 2005	From 20 001 to 50 000 inhabitants	181
January 1st, 2010	From 2 501 to 20 000 inhabitants	2 266
Non-municipal discharges		
Modified dates of completion from:	Biochemical Oxygen Demand (tons/day)	Total Suspended Solids (tons/day)
January 1st, 2000	More than 3.0	More than 3.0
January 1st, 2005	From 1.2 to 3.0	From 1.2 to 3.0
January 1st, 2010	Less than 1.2	Less than 1.2

NOM-002-SEMARNAT-1996	Establishes the maximum permissible limits of pollutants in wastewater discharges to urban and municipal sewerage systems. It was published in the Official Government Gazette on June 3rd, 1998 and came into effect the following day.
NOM-003-SEMARNAT-1997	Establishes the maximum permissible limits of pollutants for treated wastewater that is reused in services to the public. It was published in the Official Government Gazette on September 21st, 1998 and came into effect the following day.
NOM-004-SEMARNAT-2002	Environmental protection.- Sludge and biosolids.- Specifications and maximum permissible limits of pollutants for their use and final disposal. It was published in the Official Government Gazette on August 15th, 2003 and came into effect the following day.
NOM-083-SEMARNAT-2003	Specifications of environmental protection for the selection of the site, design, construction, operation, monitoring, closing and complementary works of final disposal sites for solid urban waste and special management. It was published in the Official Government Gazette on October 20th, 2004 and came into effect sixty calendar days following its publication.

NOM-022-SEMARNAT-2003	Establishes the specifications for the preservation, conservation, sustainable use and restoration of coastal wetlands in areas of mangrove swamps. It was published in the Official Government Gazette on April 10th, 2003, and came into effect sixty calendar days following its publication. There exists an agreement that adds the specification 4.43 to the Official Mexican Standard NOM-022-SEMARNAT-2003, which establishes the specifications for the preservation, conservation, sustainable use and restoration of the coastal wetlands in areas of mangrove swamps. It was published in the Official Government Gazette on May 7th, 2004 and came into effect the following day.
NOM-141-SEMARNAT-2003	Establishes the procedure to characterize mine tailings, as well as the specifications and criteria for the characterization and preparation of the site, project, construction, operation and post-operation of main tailing dams. It was published in the Official Government Gazette on September 13th, 2004 and came into effect sixty calendar days following its publication.

With the aim of complying with its obligation to publish the availability of water in the watersheds and aquifers of the country, the CONAGUA issued the standard NOM-011-CNA-2000.

NOM-011-CNA -2000	Conservation of water resources. Establishes the specifications and the method to determine the mean annual availability of the nation's waters. It was published in the Official Government Gazette on April 17th, 2002, and came into effect on June 17th, 2002.

Additionally, the CONAGUA has issued standards that establish the dispositions, specifications and test methods that guarantee that the products and services tendered to drinking water, sewerage and sanitation system water utilities comply with the objective of using and preserving water in quantity and quality. The Official Mexican Standards in effect are the following:

NOM-001-CNA-1995	Sanitary sewerage systems – Hermiticism specifications. It was published in the Official Government Gazette on October 11th, 1996. Came into effect on February 8th, 1997.
NOM-002-CNA-1995	Home outlet for drinking water supply - Specifications and testing methods. It was published in the Official Government Gazette on October 14th, 1996. It came into effect on April 12th, 1997.
NOM-003-CNA-1996	Requirements during the construction of water-withdrawal wells to prevent the pollution of aquifers. It was published in the Official Government Gazette on February 3rd, 1997, and came into effect on May 4th, 1997.
NOM-004-CNA-1996	Requirements for the protection of aquifers during the maintenance and rehabilitation of water-withdrawal wells and for the closing of wells in general. It was published in the Official Government Gazette on August 8th, 1997, and came into effect on February 3rd, 1998.
NOM-005-CNA-1996	Flux meters - Specifications and testing methods. It was published in the Official Government Gazette on July 25th, 1997. It came into effect on January 21st, 1998.
NOM-006-CNA-1997	Pre-manufactured septic tanks - Specifications and testing methods. It was published in the Official Government Gazette on January 29th, 1999, and came into effect on January 30th, 1999.
NOM-007-CNA-1997	Security requirements for the construction and operation of water tanks. It was published in the Official Government Gazette on February 1st, 1999 and came into effect on June 1st, 1999.
NOM-008-CNA-1998	Showers used for corporate hygiene - Specifications and testing methods. It was published in the Official Government Gazette on June 25th, 2001, and came into effect on December 22nd, 2001.
NOM-009-CNA-1998	Lavatories for sanitary use. Specifications and testing methods. It was published in the Official Government Gazette on August 2nd, 2001, and came into effect on November 30th, 2001.
NOM-010-CNA-1999	Inlet and discharge valves for lavatory tanks. Specifications and testing methods. It was published in the Official Government Gazette on September 2nd, 2003, and came into effect on February 29th, 2004. .
NOM-013-CNA-2000	Drinking water distribution networks. Hermiticism specifications and testing methods. It was published in the Official Government Gazette on February 4th, 2004. Came into effect on June 3rd, 2004.

Official Mexican Standards of the Ministry of Health

Water supply for human use and consumption with appropriate quality is fundamental, among other aspects, to prevent and avoid the transmission of gastrointestinal and other diseases, for which it was necessary to establish permissible limits as regards their microbiological, physical, sensory, chemical and radioactive characteristics. The standard that establishes the permissible limits of water quality is the following:

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 treatment. It was published in the Official Government Gazette on January 18th, 1996, and came into effect the following day. On November 22nd, 2000, a modification was published in the Official Government Gazette that came into effect ninety calendar days following its publication.

This standard establishes:

- Permissible limits of bacteriological characteristics (fecal coliforms and total coliforms);
- Permissible limits of physical and sensory characteristics (color, smell, taste, and cloudiness);
- Permissible limits of chemical characteristics (which include 34 parameters, such as aluminum, arsenic, barium, etc);
- Treatment methods which should be applied according to the pollutants encountered.

In the following, some other standards of importance for the health sector are indicated:

NOM-013-SSA1-1993	Health requirements that the tanks of vehicles must comply with for the transport and distribution of water for human use and consumption. It was published in the Official Government Gazette on August 12th, 1994, and came into effect the following day.
NOM-014-SSA1-1993	Health procedures for water samples for human use and consumption in public and private supply systems. It was published in the Official Government Gazette on August 12th, 1994, and came into effect the following day.
NOM-179-SSA1-1998	Vigilance and evaluation of the control of water quality for human use and consumption, distributed by public supply systems. It was published in the Official Government Gazette on September 24th, 2001, and came into effect the following day.
NOM-230-SSA1-2002	Environmental health. Water for human use and consumption, health requirements that should be complied with in public and private supply systems as part of water management. Health procedures for sampling. It was published in the Official Government Gazette on July 12th, 2005, and came into effect sixty calendar days following its publication.

Other standards

With the aim of monitoring water quality on the country's beaches, the following standard on beach quality was issued:

NMX-AA-120-SCFI-2006	Establishes the requirements and specifications of sustainability of beach quality. It was published in the Official Government Gazette on July 6th, 2006 and came into effect on the date of its publication.

Chapter 6

Water, Health and the Environment

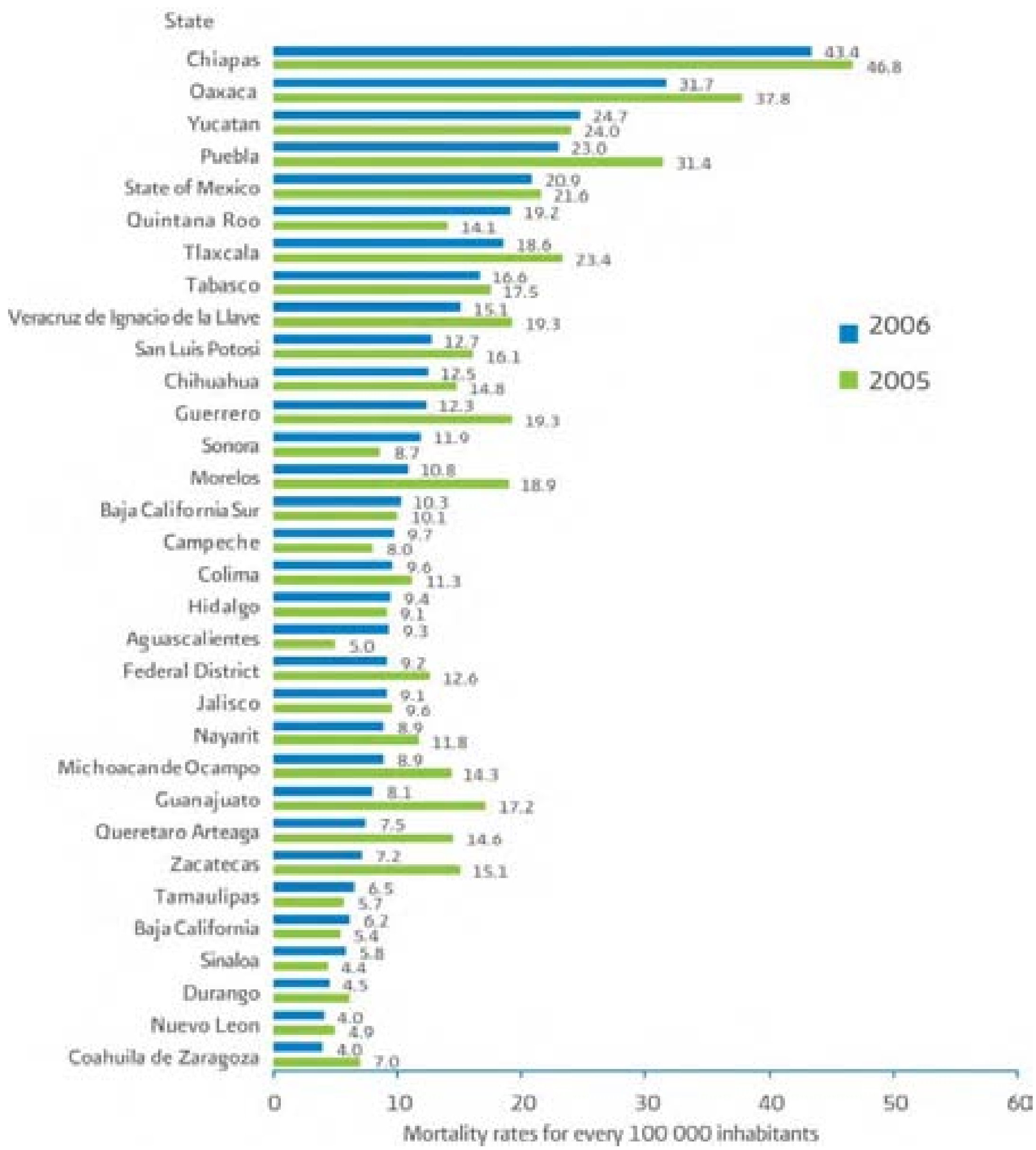
The concept of Integrated Water Resources Management includes a large number of complex interactions with ecosystems, which requires the participation of different disciplines.

That is why in this chapter the link between water and health aspects is presented, as well as its relationship with the environment. As regards the health aspects, it may be observed that increases in drinking water and sanitation coverage contribute to diminishing the mortality rates from water-borne diseases. As regards the environment, the evolution of the vegetable coverage in recent years is presented.

6.1 Water and Health

The child population is the most susceptible to ailments related to the poor quality of water. The following table shows the mortality rate through diarrheal diseases, observed for 100 000 children under five years old, for 2005 and 2006, from which it becomes apparent that in the majority of the states in Mexico apart from Aguascalientes, Baja California, Baja California Sur, Campeche, Hidalgo, Quintana Roo, Sinaloa, Sonora, Tamaulipas and Yucatan, reductions in this rate were recorded during this period.

G6.1 Mortality through diarrheal diseases in children under five years old, by state, 2005 and 2006



NOTE: The rate observed corresponds to the mortality for every 100 000 children under five years old.
Calculated based on CONAPO's population projections from the II Census of Population and Housing 2005.
SOURCE: Ministry of Health. General Office for Performance Evaluation.
http://evaluacion.salud.gob.mx/indicators/indicators2.html, June 2008.

Additionally, it has been shown that an increase in the drinking water and sanitation coverage contributes to reducing the mortality rate for diarrheal diseases, as demonstrated by the following figure:

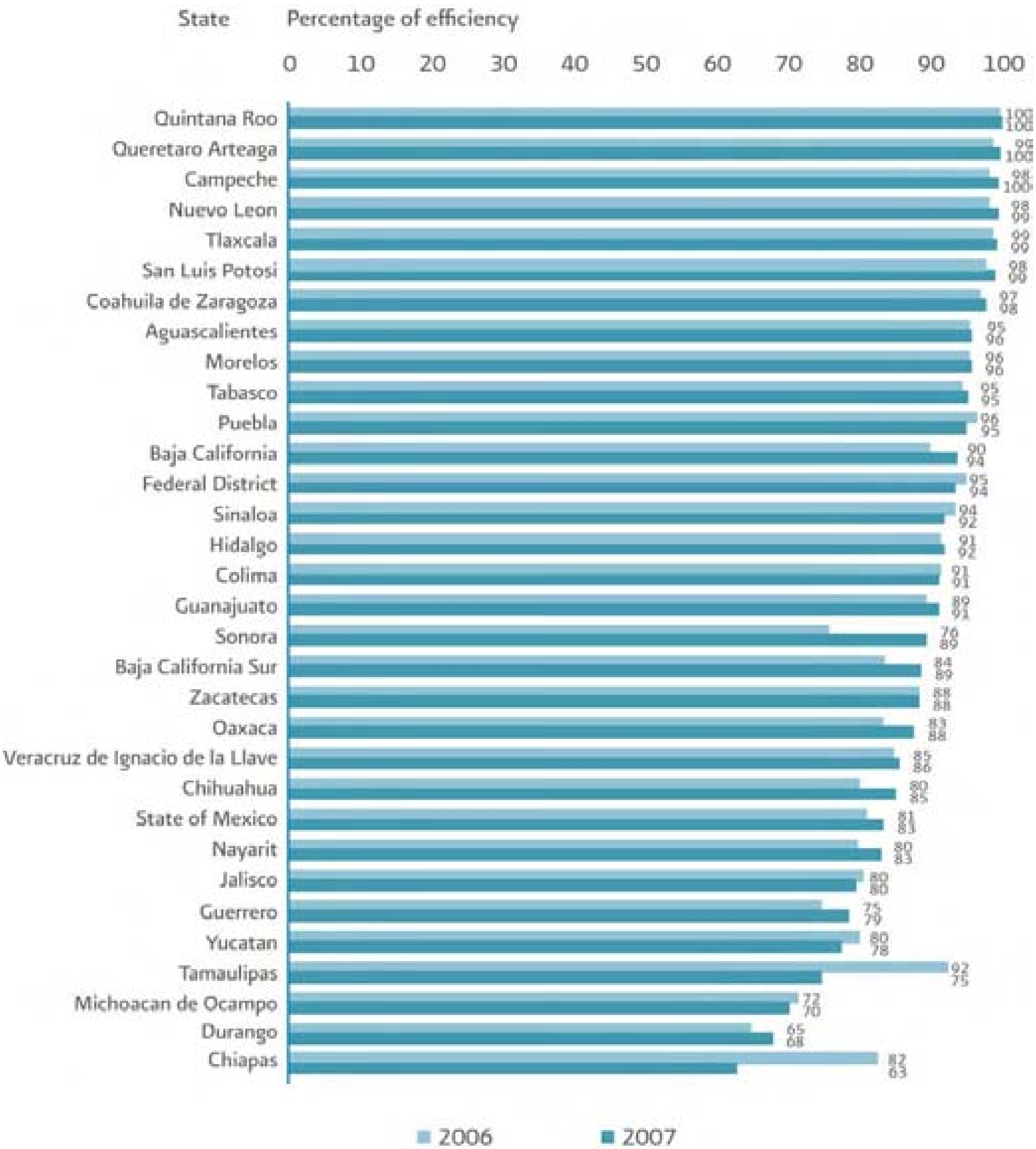
G6.2 Percentage of drinking water coverage and mortality rate through diarrheal diseases in children under 5 years old, annual series from 1990 to 2006

SOURCE: CONAGUA. Deputy Director General's Office for Planning. Produced based on data from the Ministry of Health. General Office for Performance Evaluation. http://evaluacion.salud.gob.mx/indicadores/indicadores2.html. June 2008.

The purpose of disinfecting water is to destroy or inactivate pathogenic agents and other micro-organisms, with the aim of ensuring that the consumer receives water that is suitable for human consumption.

The effectiveness of the disinfection procedure of the water that is supplied to the population is evaluated through the determination of residual free chlorine, which is a fundamental indicator, and the presence of which in the domestic outlet signals the efficiency of the disinfection. It should be noted that, according to data from COFEPRIS, the national average in terms of chlorination efficiency is 86%.

G6.3 Chlorination efficiency, 2006 and 2007



SOURCE: COFEPRIS. Chlorination efficiency, 2006 and 2007. June 2008.

6.2 Vegetation

According to data from INEGI's Charter for Use of Soil and Vegetation, Mexico is classified into 12 groups of vegetation compatible with the Rzedowski classification system (1978). The incidence of these types of vegetation in Mexico is shown in the following table according to the classification of series I, II and III.

Series I has its roots in 1978, when work began on the Charter for Use of Soil and Vegetation, scale 1:250 000, for which more than ten years were required to achieve a national coverage on the issue, in part for the extensive field work carried out.

In this cartography, the current state of vegetation is considered in its primary and secondary states. Furthermore, agricultural and livestock use were considered. To achieve this, air photographs were taken from high altitude for the photographic interpretation and field work. The information was updated from 1996 to 1999 and is known as Series II of Use of Soils and Vegetation, scale 1:250 000, in which printed space maps, generated with LANDSAT in 1993, were used as input, as well as field work from 1996 to 1999. Series III, carried out with digital processes and methods, was prepared between 2002 and 2005. Images from the LANDSAT ETM satellite from 2002 were used as input. A virtual analysis and field work were carried out.

This information is structured digitally to be used and applied in a Geographic Information System (GIS) environment. The information is organized into 14 layers and considers both polygons and dots and lines to visualize the information on the coverage of the earth. Additionally, some conceptual adjustments were made to facilitate its interpretation and digital structuring, as well as considering the conceptual generalization for its representation at scales of 1:1 000 000 and 1:4 000 000.

T6.1 Surface covered by type of natural vegetation in Mexico, series I, II and III

No.	Type of vegetation or use of soil	Original surface (thousands of hectares)	%	1980 series I surface (thousands of hectares)	%	1990 series II surface (thousands of hectares)	%	2005 series III original (thousands of hectares)	%
1	Conifer forests	21 772	11.1	16 196	8.2	13 956	7.1	11 340	5.8
2	Oak forests	22 195	11.3	12 128	6.2	10 838	5.5	9 982	5.1
3	Mountain mesophile forests	3 089	1.6	1 192	0.6	1 022	0.5	870	0.4
4	Deciduous forests	25 311	12.9	9 827	5.0	6 980	3.6	7 843	4.0
5	Thorny rainforests	7 207	3.7	4 891	2.5	188	0.1	827	0.4
6	Evergreen forests	17 828	9.1	6 382	3.2	3 996	2.0	3 158	1.6
7	Moist deciduous forests	6 276	3.2	894	0.5	533	0.3	463	0.2
8	Xerophile brushwood	66 421	33.8	55 922	28.5	52 136	26.5	53 233	27.1
9	Pasture	18 682	9.5	9 795	5.0	8 406	4.3	8 445	4.3
10	Absorbent vegetation	3 571	1.8	2 421	1.2	2 248	1.1	2 540	1.3
11	Other types of vegetation	872	0.4	315	0.2	6 009	3.1	415	0.2
12	With no apparent vegetation	735	0.4	837	0.4	982	0.5	952	0.5
	Induced vegetation	0	0.0	5 827	3.0	6 203	3.2	6 619	3.4
	Secondary vegetation	0	0.0	32 456	16.5	38 722	19.7	42 368	21.6
	Agricultural areas	0	0.0	34 671	17.7	40 612	20.7	43 596	22.2
	Urban zones	0	0.0	201	0.1	1 121	0.6	1 279	0.7
	Water bodies	2 478	1.3	2 482	1.3	2 487	1.3	2 508	1.3
Mexico's total surface area		**196 438**	**100.0**	**196 438**	**100.0**	**196 438**	**100.0**	**196 438**	**100.0**

SOURCE: Based on information for the evaluation of the rate of deforestation, INEGI. Mexico, 2008.

M6.1 Vegetation in Mexico, Series 3, Mexico 2003

SOURCE: CONAGUA. Deputy Director General's Office for Planning.
Produced based on data from INEGI. Charter for Use of Soil and Vegetation. Series III. Mexico 2003.

6.3 Biodiversity

With the aim of conserving the status of protected natural areas, as well as ensuring that they retain their function as areas of groundwater recharge, the necessary decrees are established for the protection of ground-based ecosystems and wetlands in particular, both nationally and worldwide.

In Mexico, the number of protected natural areas for flora and fauna increased to 164 in 2007, covering a total surface area of 232 000 km^2. The following figure shows the land and coast areas covered by the protected natural areas.

M6.2 Protected natural areas in Mexico, by Hydrological-Administrative Region, 2007

SOURCE: SEMARNAT. Compendium of Environmental Statistics 2006. Mexico, 2007.

The following table shows a summary by category of the country's natural protected areas.

T6.2 Mexico's natural protected areas, 2007

Category	Quantity	Surface area (hectares)
Biosphere Reserves	38	11 908 935
National Parks	68	1 473 492
Natural monuments	4	14 104
Natural resources protection areas	7	3 562 807
Flora and fauna protection areas	29	6 248 471
Sanctuaries	17	871
Total		23 208 680

SOURCE: CONANP. Direction for Evaluation and Follow-up. 2008.

6.4 Wetlands

Wetlands constitute a basic and irreplaceable link of the water cycle. Their conservation and sustainable management may ensure the biological richness and environmental services that they perform, such as water storage, the conservation of aquifers, water treatment through nutrient, sediment and pollutant retention, protection against storms and flood mitigation, the stabilization of coasts and erosion control.

These ecosystems have gone through transformation processes with various purposes, and the lack of knowledge on them and their inappropriate management constitute some of the main problems that adversely affect their conservation in Mexico. For all of the above, they have recently been the subject of standardization and protection efforts, so as to conserve them.

Nationally, as stipulated in the 1992 National Water Law, it is the CONAGUA's responsibility to carry out and update the National Inventory of Wetlands, as well as to mark their limits, classify them and propose standards for their protection, restoration and use.

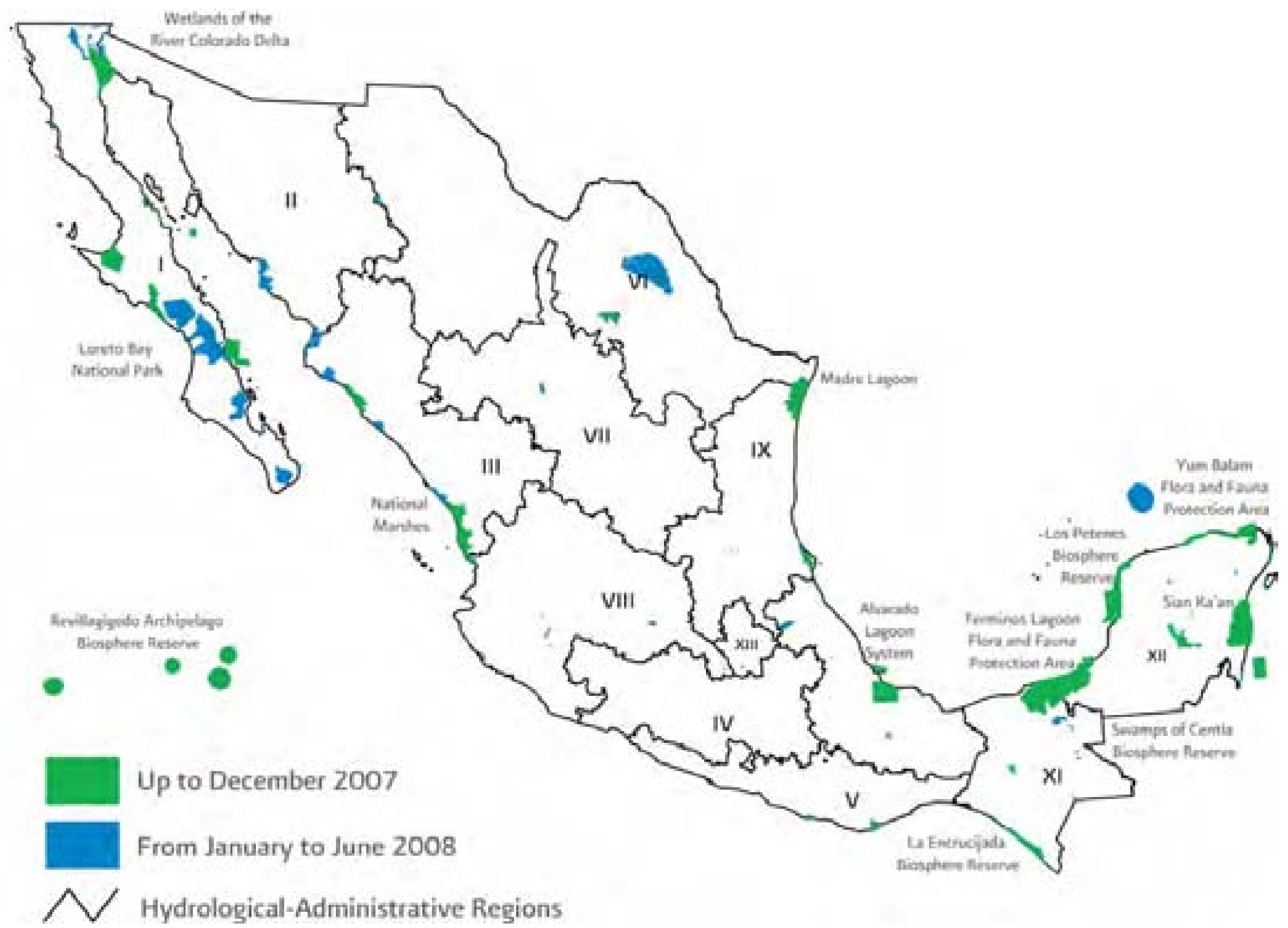
For this purpose an inter-institutional group was created, which brings together interests on wetlands, from various agencies of the federal government. Among other institutions, the members of this group include the CONAGUA, the National Commission for the Knowledge and Use of Biodiversity (CONABIO), the National Commission for Protected natural areas (CONANP), the National Ecological Institute (INE), the National Statistics, Geography and Informatics Institute (INEGI), and, on behalf of the Ministry of the Environment and Natural Resources (SEMARNAT), the General Office of Federal Maritime Ground and Environmental Coastal Zones

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"[1].

Up to December 2007, 67 Mexican wetlands had been registered in the Ramsar Convention, and at the close of this edition, 19 further wetlands in Mexico had been added, bringing the total surface area of the country registered to 5.9 million hectares. In annex, you will find a complete list of the Mexican wetlands registered in the Ramsar Convention. Among the 86 Mexican wetlands now registered in this Convention, the most important in terms of size are shown in the figure M6.3.

[1] Website of the Ramsar Convention, www.ramsar.org/index.html, June 2007.

M6.3 Wetlands with more than 100 000 hectares in Mexico, registered in the Ramsar Convention, 2007



SOURCE: Consultation of the CONANP's Geographic Information System. Mexico, June 2008.

Chapter 7

Future Scenarios

According to current population growth trends, use and management of water resources, it is estimated that by 2030, the situation as regards water in Mexico will be more critical. For this reason, to face up to this situation, in the 2007-2012 National Water Program, specific goals, strategies and targets have been established with the aim of modifying the current situation.

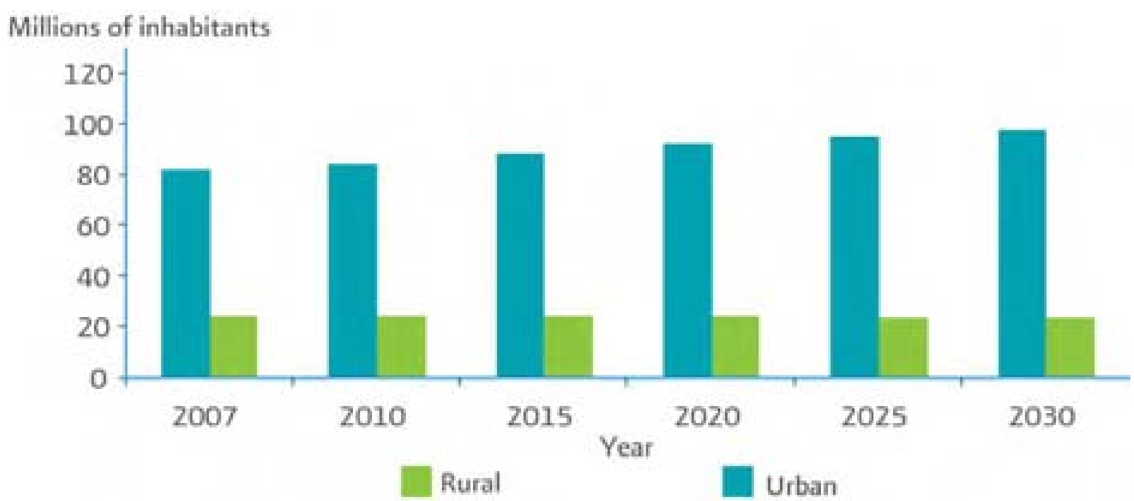
This chapter also presents the projections for 2030 as regards population, urban areas and water availability, by Hydrological-Administrative Region. Additionally, the targets for 2012 and 2030 as regards water resources are explained.

7.1 Growth Trends

A 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 by the CONAPO, between 2007 and 2030, the population of Mexico will increase by almost 14.9 million people. Furthermore, approximately 82% of the total population will be based in urban localities.

It is estimated that 70% of the population growth for 2030 will occur in the Hydrological-Administrative Regions VIII Lerma-Santiago-Pacific, XIII Waters of the Valley of Mexico, VI Rio Bravo and I Baja California Peninsula. On the other hand, the regions III Northern Pacific and V Southern Pacific will experience a decrease in their population.

G7.1 Projected urban and rural population growth in Mexico, 2007 to 2030



Type of population	2007	2010	2015	2020	2025	2030
Rural	24.50	24.42	24.28	24.10	23.86	23.50
Urban	81.73	84.38	88.40	91.98	95.09	97.61
Total	**106.23**	**108.80**	**112.68**	**116.08**	**118.95**	**121.11**

NOTE: Data interpolated on December 31st of each year.
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.
SOURCE: CONAGUA. Deputy Director General's Office for Planning. Produced based on data from the CONAPO. Population Projections in Mexico 2005-2050. Mexico, 2007.

T7.1 Population in 2007 and 2030, by Hydrological-Administrative Region
(thousands of inhabitants)

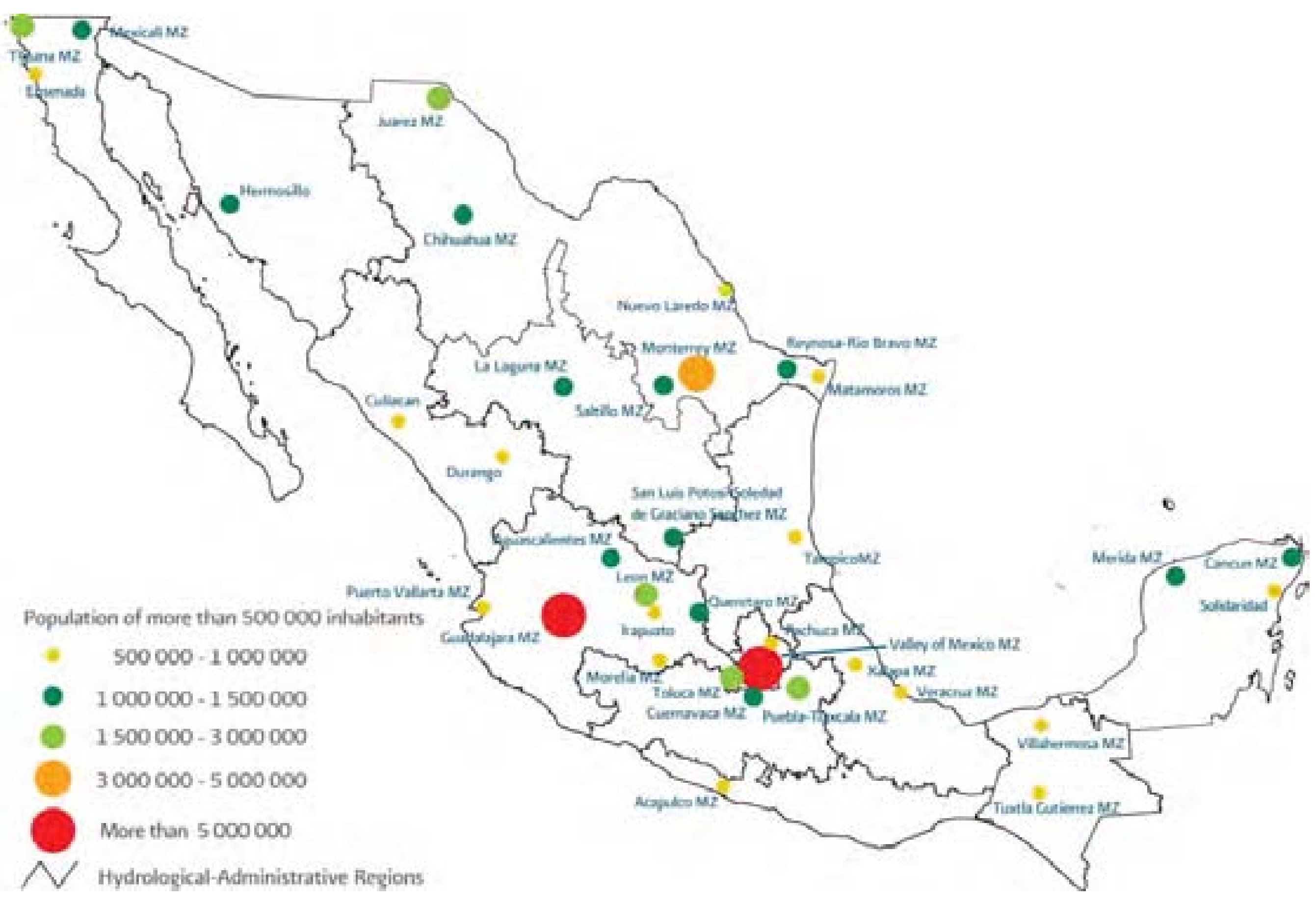
Hydrological-Administrative Region		Population		Expected population growth
		Year 2007	Year 2030	
I	Baja California Peninsula	3 581	5 915	2 334
II	Northwest	2 572	2 910	338
III	Northern Pacific	3 959	3 795	- 164
IV	Balsas	10 536	11 127	591
V	Southern Pacific	4 116	4 022	- 94
VI	Rio Bravo	10 704	13 252	2 548
VII	Central Basins of the North	4 121	4 568	447
VIII	Lerma-Santiago-Pacific	20 625	23 512	2 887
IX	Northern Gulf	4 941	5 099	158
X	Central Gulf	9 584	9 925	341
XI	Southern Border	6 503	7 498	1 001
XII	Yucatan Peninsula	3 904	5 807	1 903
XIII	Waters of the Valley of Mexico	21 090	23 673	2 583
Total		**106 236**	**121 103**	**14 867**

NOTE: The projection considers the population interpolated on December 31st of each year.
SOURCE: CONAPO. Population Projections in Mexico 2005-2050. Mexico, 2007.

In 2030, it is expected that 57% of the population of Mexico will be living in 36 population centers with more than 500 000 inhabitants.

Between 2007 and 2030, the metropolitan zones of Matamoros, Pachuca, Nuevo Laredo and Puerto Vallarta, as well as the municipalities of Irapuato, Ensenada and Solidaridad, will exceed half a million inhabitants. In the following figure all of the population centers of at least 500 000 inhabitants are shown.

M7.1 Population of more than 500 000 inhabitants, projection for 2030

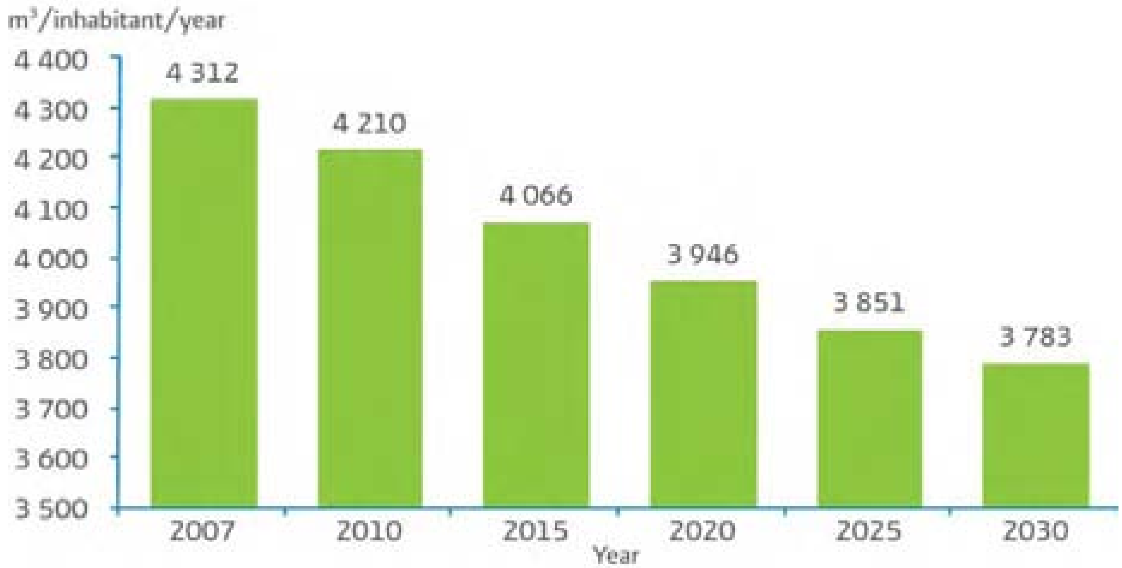


NOTE: Includes metropolitan zones and isolated municipalities.
SOURCE: CONAGUA. Deputy Director General's Office for Planning. Produced based on data from:
SEDESOL, INEGI and CONAPO. Limits of the metropolitan zones in Mexico. Mexico, 2004.
INEGI. II Census on Population and Housing 2005. Mexico, 2007.
CONAPO. Population Projections in Mexico 2005-2050. Mexico, 2007.

The following figure shows how the population growth will cause the natural per capita water availability nationwide to drop from 4 312 m^3/inhabitant/year in 2007 to 3 783 in 2030.

G7.2 Projections of the natural mean per capita availability of water in Mexico, selected years from 2007 to 2030

(m³/inhabitant/year)



NOTES: The data considered was the following: For the total mean natural availability, 458 100 million cubic meters per year (data from 2007).
For the population, the data is estimated up to December, based on CONAPO's 2005-2050 population projections.
SOURCE: CONAGUA. Deputy Director General's Office for Planning. Produced based on data from:
CONAPO. Population Projections in Mexico 2005-2050. Mexico, 2007.
CONAGUA. Deputy Director General's Office for Technical Affairs.

By 2030, in some of the country's Hydrological-Administrative Regions, the mean natural water availability will reach levels close to or even less than 1 000 m³ /inhabitant/year, a condition classified as serious scarcity.

As shown in the following table, the Hydrological-Administrative Regions I Baja California Peninsula, VI Rio Bravo and XIII Waters of the Valley of Mexico in particular are at risk of finding themselves in a situation of scarcity.

T7.2 Mean natural per capita availability of water, by Hydrological-Administrative Region, 2007 and 2030

Hydrological-Administrative Region	Mean natural availability (millions of m³/year)	Mean natural per capita availability in 2007 (m³/inhabitant/year)	Mean natural per capita availability in 2030 (m³/inhabitant/year)
I Baja California Peninsula	4 616	1 289	780
II Northwest	8 204	3 192	2 819
III Northern Pacific	25 627	6 471	6 753
IV Balsas	21 658	2 055	1 946
V Southern Pacific	32 794	7 960	8 154
VI Rio Bravo	12 024	1 124	907
VII Central Basins of the North	7 780	1 888	1 703
VIII Lerma-Santiago-Pacific	34 037	1 650	1 448
IX Northern Gulf	25 500	5 162	5 001
X Central Gulf	95 455	9 964	9 618
XI Southern Border	157 754	24 270	21 039

(continues)

(continued)

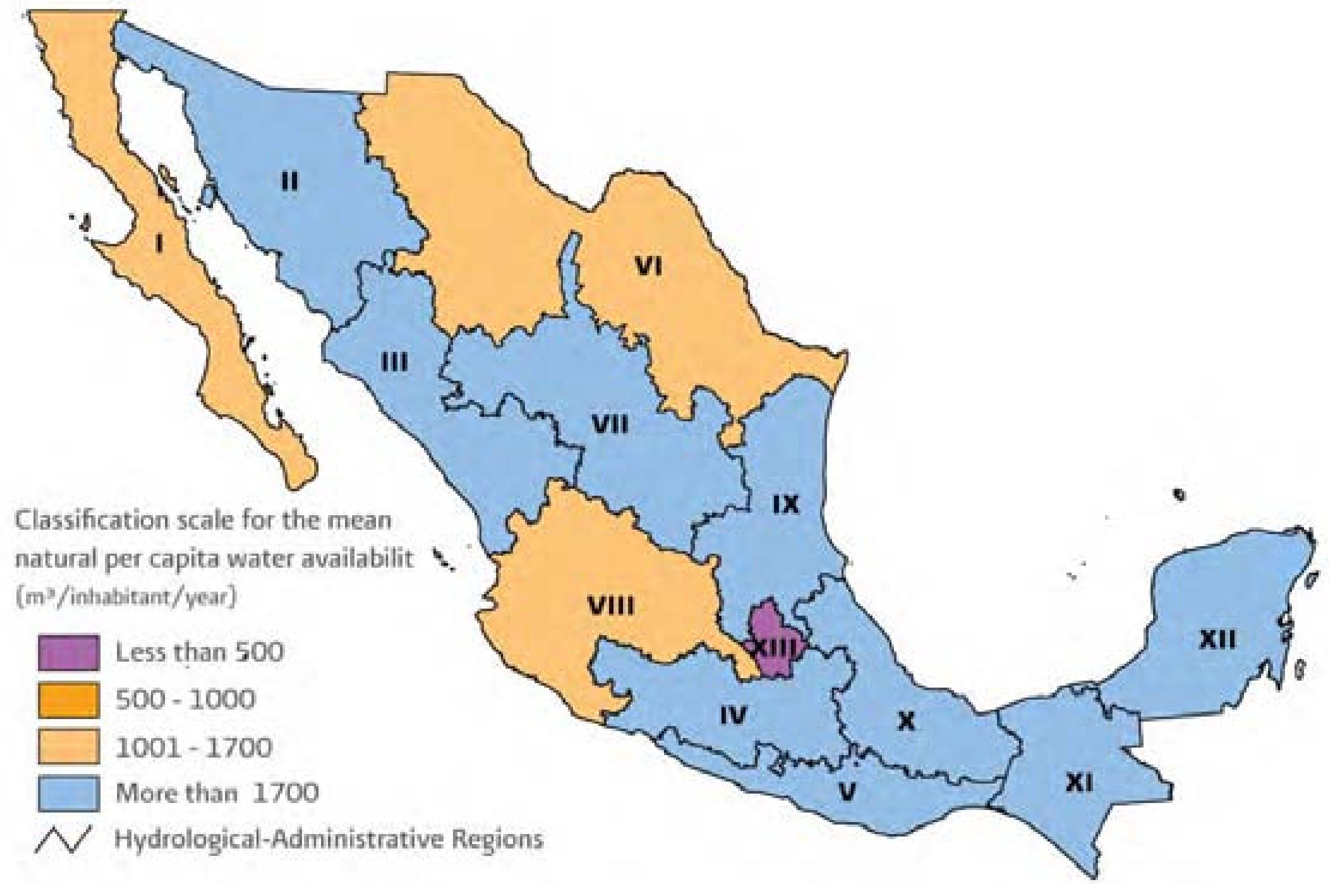
T7.2 Mean natural per capita availability of water, by Hydrological-Administrative Region, 2007 and 2030

Hydrological-Administrative Region	Mean natural availability (millions of m³/year)	Mean natural per capita availability in 2007 (m³/inhabitant/year)	Mean natural per capita availability in 2030 (m³/inhabitant/year)
XII Yucatan Peninsula	29 645	7 603	5 105
XIII Waters of the Valley of Mexico	3 008	143	127
Total	**458 100**	**4 312**	**3 783**

NOTES: The data considered was the following:
For the total mean natural availability, 458 100 million cubic meters per year (data from 2007).
For the population, the data is estimated up to December, based on CONAPO's 2005-2050 population projections.
SOURCE: CONAGUA. Deputy Director General's Office for Planning. Produced based on data from:
CONAPO. Population Projections in Mexico 2005-2050. Mexico, 2007.
CONAGUA. Deputy Director General's Office for Technical Affairs.

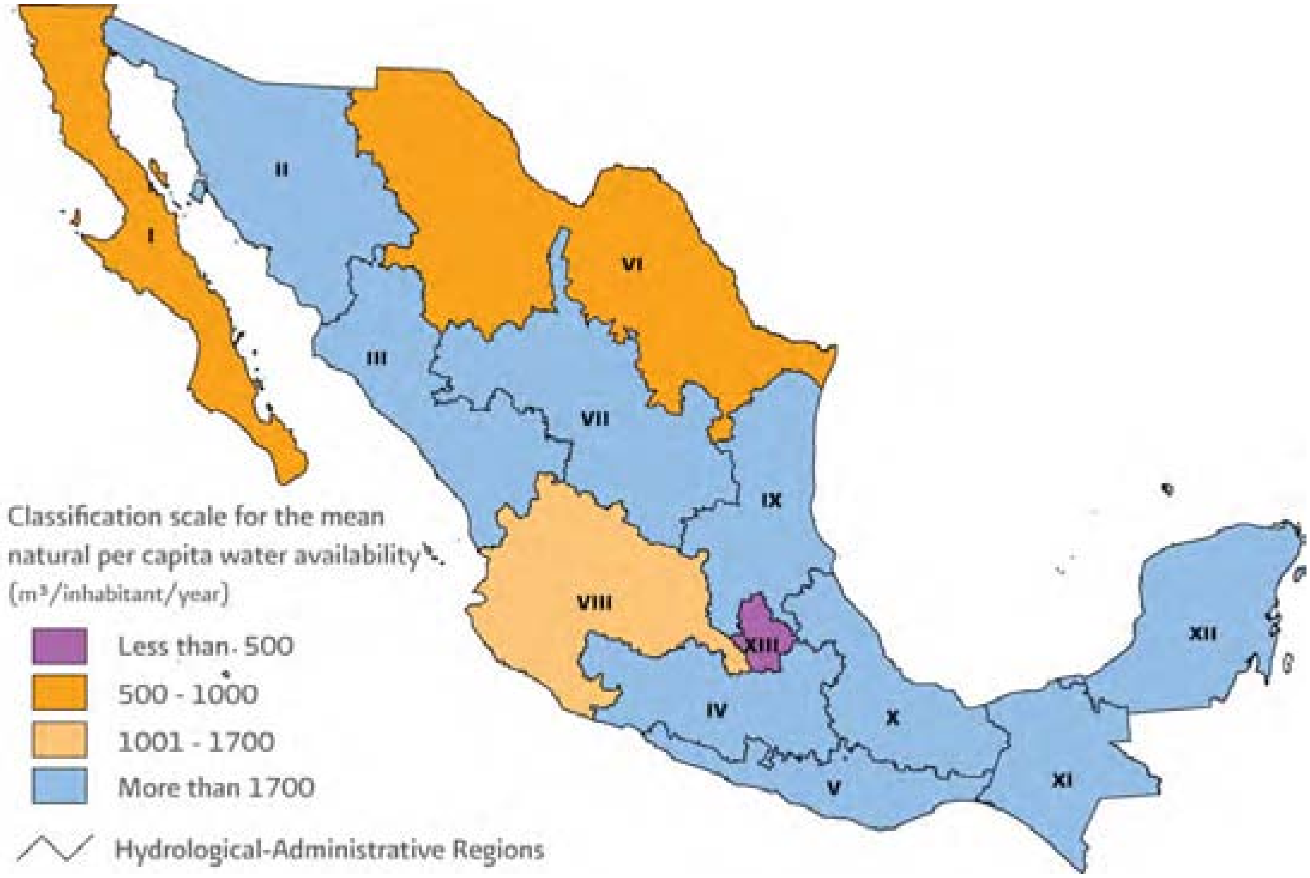
Special attention will have to be paid to groundwater, since its overexploitation leads to the subsidence of the phreatic levels and the sinking of ground levels, as well as causing wells to have to be dug deeper and deeper to withdraw water. It is worth mentioning that the majority of the rural population, especially in arid areas, depends almost exclusively on groundwater.

M7.2 Mean natural per capita water availability, by Hydrological-Administrative Region, 2007



SOURCE: CONAGUA. Deputy Director General's Office for Planning. Produced based on data from:
Population Projections in Mexico 2005-2050. Mexico, 2007.
CONAGUA. Deputy Director General's Office for Technical Affairs.

M7.3 Projection of the mean natural per capita water availability, by Hydrological-Administrative Region, 2030



NOTE: Population interpolated a December of each year.
SOURCE: CONAGUA. Deputy Director General's Office for Planning. Produced based on data from:
Population Projections in Mexico 2005-2050. Mexico, 2007.
CONAGUA. Deputy Director General's Office for Technical Affairs.

With the aim of facing up to 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 volume of wastewater that is treated and reused must increase significantly, with the aim of enhancing the availability of water of appropriate quality for the uses for which it is destined.

In addition, it will be necessary to significantly increase the volumes of wastewater treated and reused, with the aim of increasing the availability of water with sufficient quality for the uses for which it is intended. Furthermore, in order to continue to guarantee social development, it will be necessary to significantly increase the drinking water and sanitation coverage.

7.2 National Development Plan 2007-2012

The 2007-2012 National Development Plan (NDP) has the objective of establishing the national goals, strategies and priorities so that, in the current administration, progress can be made towards the achievement of the vision that we have set for our nation over the coming years.

The objectives of the NDP are aligned with those of the Vision Mexico 2030, which aims to allow "…all Mexicans to have a dignified existence without compromising the inheritance of the future generations". The Vision has been formulated as follows:

"Towards 2030, we Mexicans see Mexico as a country of laws, where our families and our inheritance are assured, and we can exercise our freedoms and rights without any restrictions; a country with a highly competitive economy with a dynamic and sustainable growth, generating sufficient well-paid employment; a country with equal opportunities for all, where Mexicans fully exercise their social rights and where poverty has been eradicated; a country with a sustainable development in which there exists a culture of respect and of conservation of the environment; a fully democratic nation whose leaders offer clear accounts to the citizens, in which the political actors work together in a responsible manner and build agreements to promote the permanent development of the country; a nation that has consolidated a mature and equitable relationship with North America, and shows leadership in Latin America."

In the NDP, national goals and strategies are established for each of the five areas of public policy that compose it, as well as a series of targets associated with them. These areas are:

1. State of law and security.
2. Competitive economy that generates employment.
3. Equal opportunities.
4. Environmental sustainability.
5. Effective democracy and responsible foreign policy.

From the NDP, sector-wide, special, institutional and regional programs have been derived, among which the National Water Program 2007-2012.

7.3 National Water Program 2007-2012

The National Water Program 2007-2012 (NWP) incorporates the objectives, strategies and goals that have been set in the National Development Plan with regard to water management and preservation. In addition, it assimilates the concepts, proposals and goals of the Sectoral Program for the Environment and Natural Resources. The NWP basically seeks to improve the conditions of social wellbeing of all Mexicans, the economic development and the preservation of the environment in the country. The NWP assimilates the goals and strategies associated with the management and preservation of water, and is formulated in a participatory manner based on the following elements:

- 2007-2012 National Development Plan.
- 2007-2012 National Infrastructure Plan
- 2007-2012 Sectoral Program for the Environment and Natural Resources.
- National Water Programs prepared in previous government administrations.
- Water programs for each Hydrological-Administrative Region.
- Workshops held on topics of special relevance.
- A public consultation carried out through the National Water Commission's web page in order to gather the proposals from the citizens.

The goals established in the NWP are the following:

1. To improve water productivity in the agricultural sector.
2. To increase access to and quality of drinking water, sewerage and sanitation services.
3. To promote integrated, sustainable water management in river basins and aquifers.
4. To enhance the technical, administrative and financial development of the water sector.
5. To consolidate the participation of users and organized society in water management and to promote a culture for the proper use of this resource.

6. To prevent risks from meteorological and hydro-meteorological events and attend to their effects.
7. To assess the effects of climate change on the hydrologic cycle.
8. To create a culture for paying duties and complying with the National Water Law in its administrative aspects.

In order to reach the goals of the NWP, 68 strategies and 115 targets have been established (one target for each indicator). Additionally, in the NWP the organizations and institutions most related to the achievement of each goal are included, as well as the challenges to be overcome to reach the planned targets. In the following table the main medium-term (2012) and long-term (2030) targets are presented:

T7.4 Main targets for 2012 and 2030 as regards water resources

Goal	Strategy	Indicator	Situation 2007	Target for 2012	Ideal target for 2030
1	Modernize the hydro-agricultural infrastructure and technify the agricultural areas in coordination with users and local authorities.	Hectares modernized	2.27 million	3.28 million	5.95 million
1	Modernize the hydro-agricultural infrastructure and technify the agricultural areas in coordination with users and local authorities.	Rehabilitated technified rainfed area (hectares)	414.2 thousand	487.5 thousand	511.5 thousand
1	Extend the agricultural border of irrigation and technified rainfed in zones with availability of water subject to land planning	Hectares included in irrigation	6.511 thousand	6 603 thousand	10 000 thousand
1	Extend the agricultural border of irrigation and technified rainfed in zones with availability of water subject to land planning.	Hectares included in technified rainfed	2 745 thousand	2 803 thousand	7 500 thousand
1	Maintain in appropriate working conditions the dams managed by the CONAGUA.	Rehabilitated dams	265	499	750
2	Treat the wastewater generated and promote the reuse and exchange of this wastewater.	Treatment of wastewater collected (%)	38.3	60.0	100
2	Increase the coverage of drinking water and sanitation services in Mexico, leading to the sustainability of the services.	Drinking water coverage (%)	89.9	95.0	100
2	Increase the coverage of drinking water and sanitation services in Mexico, leading to the sustainability of the services.	Sanitation coverage (%)	86.1	88.0	100
2	Improve the quality of the water supplied to populations.	Volume of water disinfected (%)	96.3	98.0	100
3	Publish the availability of water in the country's aquifers and watersheds.	Aquifers with published availability	252	653	653
3	Publish the availability of water in the country's aquifers and watersheds.	Watersheds with published water availability	491	718	718
8	Review the sources of income from the nation's water and in particular wastewater discharges, in order to contribute to the sanitation of the watersheds and aquifers.	Annual amount received through the heading of the payment of duties (millions of 2006 Mexican pesos)	8 718	9 700	More than10 000
8	Strengthen the application of the control mechanisms planned by law and watch over the appropriate use of the concessions and allocations of the nation's water and discharge permits to bring about an appropriate management and preservation of water resources.	Inspection visits to users of the nation's water and their inherent goods	3 thousand	Does Not Apply	432.8 thousand

SOURCE: CONAGUA. National Water Program 2007-2012. Progress and Targets 2008.

Chapter 8

Water in the World

Through various indicators, this chapter allows the reader to have an overview of the state of water resources in the world and in particular to understand Mexico's situation in the international context.

Among the main indicators are those of population, GDP, precipitation, availability of water, uses of water, irrigation infrastructure, dams, coverage of services and water stress, among others.

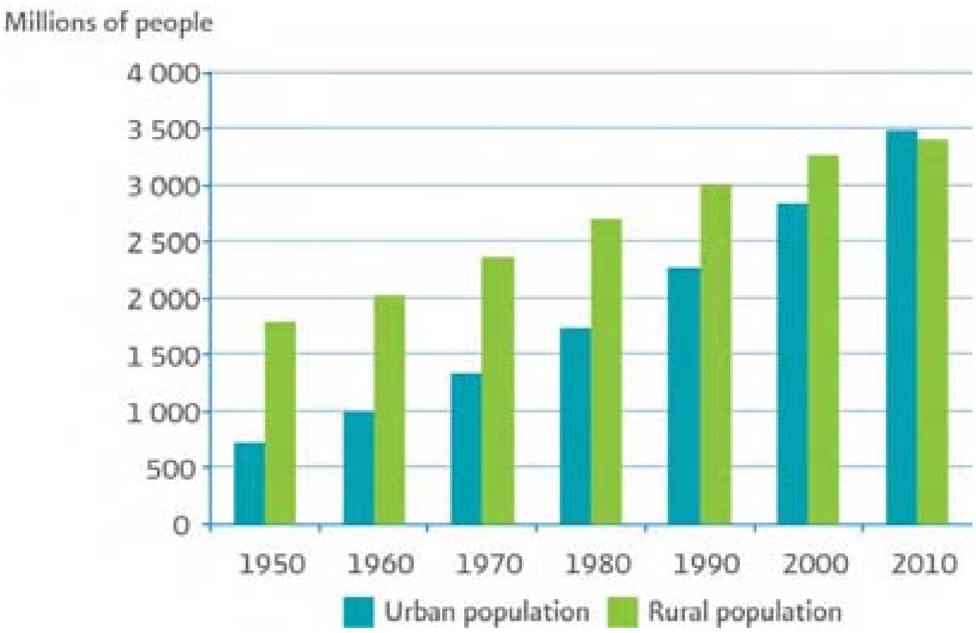
Some topics of topical interest have also been included in recent editions, such as the water footprint, virtual water and climate change

8.1 Socio-Economic and Demographic Aspects

In 1950, the world population was 2 534 million people, whereas for 2005, it had risen to 6 515 million. It is estimated that by 2010, this population will be 6 907 million, and that this future growth will be concentrated mainly in the least developed countries, where the population is growing at a rate five times faster than that in developed countries.

Similarly, a further characteristic of the world demography is the trend towards a concentration of the population in urban centers. This trend is even more pronounced in the least developed countries of the world.

G8.1 Conduct of the world population by urban and rural sectors, period 1950-2010



Year	1950	1960	1970	1980	1990	2000	2010
Rural	1 798	2 036	2 367	2 711	3 020	3 270	3 412
Urban	736	996	1 332	1 740	2 275	2 854	3 495
Total	**2 534**	**3 032**	**3 699**	**4 451**	**5 295**	**6 124**	**6 907**

SOURCE: UNDESA. World Population Prospects: The 2006 Revision and World Urbanization Prospects: The 2007 Revision, http://esa.un.org/unup. June 2008.

As a consequence of this trend towards converging in urban centers, it may be observed that an ever-increasing percentage of the world's population now lives in mega-cities.

T8.1 Largest population centers of the world, by total population, 2007

No.	Urban center	Population (millions of inhabitants)
1	Tokyo, Japan	35.67
2	Mexico City, Mexico	19.35[a]
3	New York, USA	19.04
4	Bombay, India	18.98
5	Sao Paulo, Brazil	18.84
6	Delhi, India	15.93
7	Shanghai, China	14.99
8	Calcuta, India	14.79
9	Dhaka, Bangladesh	13.49
10	Buenos Aires, Argentina	12.80
11	Los Angeles, USA	12.50
12	Karachi, Pakistan	12.13
13	Cairo, Egypt	11.89
14	Rio de Janeiro, Brazil	11.75
15	Osaka, Japan	11.29
16	Beijing, China	11.11
17	Manila, Filipinas	11.10
18	Paris, France	9.90
19	Seoul, South Korea	9.80
20	Jakarta, Indonesia	9.13

NOTE: [a]Population of the Metropolitan Zone of the Valley of Mexico.
SOURCE: UNDESA. World Population Prospects: The 2006 Revision and World Urbanization Prospects: The 2007 Revision, http://esa.un.org/unup. June 2008.
CONAPO. Population Projections in Mexico, 2005-2050. Mexico 2007.
SEDESOL, INEGI and CONAPO. Limits of the metropolitan zones in Mexico. 2005. Mexico.

In the following table, the world's most populated countries are presented, among which Mexico is ranked 11th out of a total of 222. It is worth mentioning that there are five countries, in addition to Mexico, which appear in every table of this chapter as references, namely Brazil, the United States of America, France, South Africa and Turkey, with the aim of illustrating the situation of these countries in the international context.

T8.2 The world's most populated countries, 2005

No.	Country	Population (millions of inhabitants)	Land extension (thousands of km²)	Population density (inhabitants/km²)
1	China	1 312.98	9 598.09	137
2	India	1 134.40	3 287.26	345
3	United States of America	299.85	9 632.03	31
4	Indonesia	226.06	1 904.57	119
5	Brazil	186.83	8 514.88	22
6	Pakistan	158.08	796.10	199
7	Bangladesh	153.28	144.00	1 064
8	Russia	141.95	17 098.24	8
9	Nigeria	141.36	923.77	153
10	Japan	127.90	377.91	338
11	Mexico	105.79	1 964.38	54
12	Vietnam	85.03	329.31	258
13	Philippines	84.57	300.00	281
14	Germany	82.65	357.05	231
15	Ethiopia	78.99	1 104.30	72
16	Turkey	72.97	783.56	93
17	Egypt	72.85	1 001.45	72
18	Iran	69.42	1 745.15	40
19	Thailand	63.00	513.12	123
20	France	60.99	551.50	111
25	South Africa	47.94	1 219.09	39

SOURCE: CONAGUA. Deputy Director General's Office for Planning. Produced based on data from UNDESA. World Population Prospects: The 2006 Revision and World Urbanization Prospects: The 2007 Revision, http://esa.un.org/unup. June 2008.
INEGI. Yearbook of Statistics by State, Edition 2007. Mexico, 2007.
INEGI. General Censuses.

The following table presents information on the countries with the highest Gross Domestic Product per capita. It is worth noting that Mexico is ranked 54th out of 178 countries evaluated.

T8.3 Countries with the highest Gross Domestic Product per capita, 2007

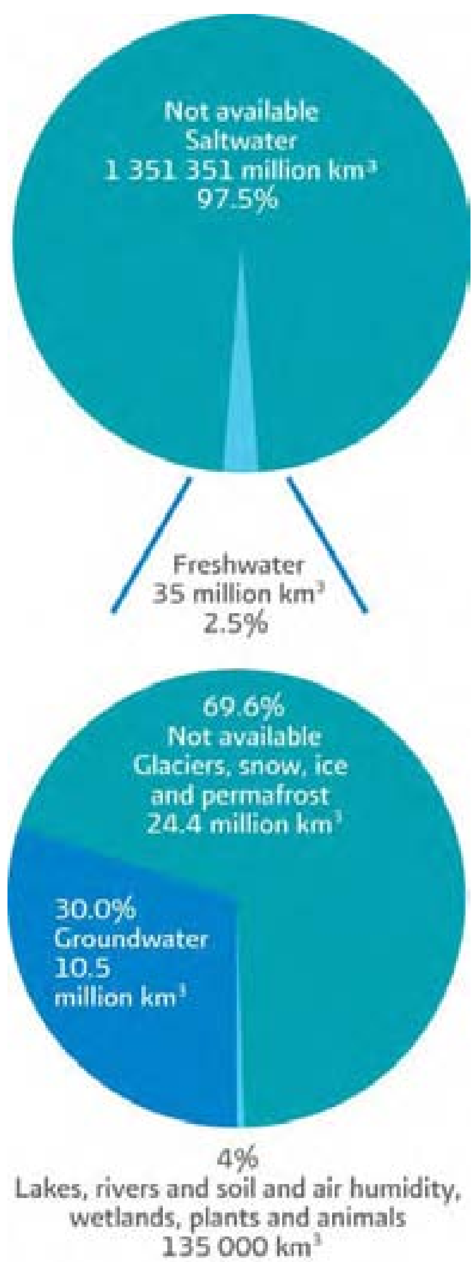
No.	Country	Total GDP (billions of USD)	GDP (USD/ inhabitant)
1	Luxembourg	50	104 673
2	Norway	391	83 922
3	Qatar	68	72 849
4	Iceland	20	63 830
5	Ireland	259	59 924
6	Switzerland	424	58 084
7	Denmark	312	57 261
8	Sweden	455	49 655
9	Finland	245	46 602
10	Netherlands	769	46 261
11	United States of America	13 844	45 845
12	United Kingdom	2 773	45 575
13	Austria	374	45 181
14	Canada	1 432	43 485
15	Australia	909	43 312
16	United Arab Emirates	193	42 934
17	Belgium	454	42 557
18	France	2 560	41 511
19	Germany	3 322	40 415
20	Italy	2 105	35 872
48	Turkey	663	9 629
54	Mexico	893	8 479
60	Brazil	1 314	6 938
64	South Africa	283	5 906

NOTE: GDP= Gross Domestic Product, USD= United States Dollars
SOURCE: FAO. Information System on Water and Agriculture, Aquastat. www.fao.org/AG/AGL/aglw/aquastat/main/index.stml. June 2008.
International Monetary Fund, World Economic Outlook. United States of America, 2008.
Bank of Mexico, www.banxico.org.mx. June 2008.
INEGI. II Census of Population and Housing 2005.

8.2 Components of the Hydrologic Cycle in the World

The average annual availability of water in the world is approximately 1 386 million cubic kilometers, of which 97.5% is saltwater and only 2.5%, or 35 million cubic kilometers, is freshwater. Of that amount, almost 70% is unavailable for human consumption since it is locked up in glaciers, in snow and ice. Of the water that is technically available for human consumption, only a small percentage is in lakes, rivers, soil humidity and relatively shallow groundwater deposits, the renovation of which is a product of infiltration. Much of this theoretically usable water is far from populated areas, making it difficult or impossible to effectively use it.

G8.2 Global distribution of water in the world.



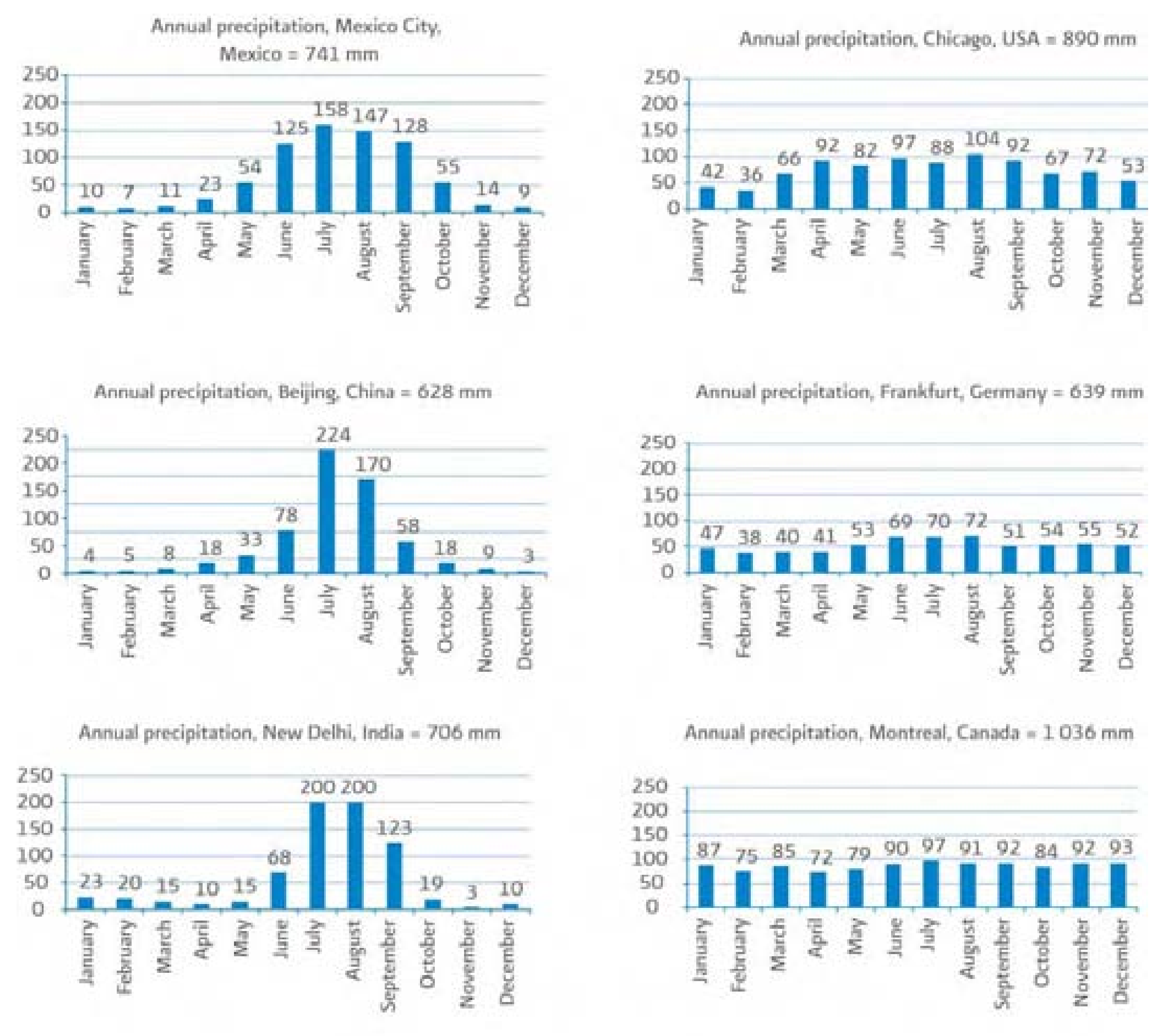
SOURCE: Clarke, Robin and King, Jannet, The Water Atlas, United States of America, 2004.

Precipitation

Precipitation constitutes an important part of the hydrologic cycle, since it produces the planet's renewable water. However, precipitation varies from country to country and from region to region, depending on the climate and the geographical situation. In the majority of Mexico, the precipitation is torrential and occurs mainly in the summer.

The following figures show the differences that can be observed between Mexico City and other cities in the world, which are characterized by either having a uniform precipitation throughout the year – cities with greater latitudes, or by a greater precipitation in the summer – cities closer to the equator.

G8.3 Comparison between the mean monthly precipitation in various cities in the world
(millimeters)



NOTE: The normal periods considered are variable for each city, so the years are not specified.
SOURCE: CONAGUA. Deputy Director General's Office for Planning. Produced based on: World Climate (www.worldclimate.com). June 2008.
CONAGUA. Deputy Director General's Office for Technical Affairs.

Availability of water

The mean natural per capita availability of a country may be calculated by dividing its renewable resources by the number of inhabitants. According to this criterion, Mexico is 89th worldwide out of 177 countries on which data exists, in terms of the mean per capita availability. It should be mentioned that in the case of Mexico, the national availability hides a strong regional variation.

T8.4 Countries with the highest mean per capita availability, 2007

No.	Country	Mean precipitation (millimeters)	Availability (billions of m³)	Availability natural media per capita (m³/inhabitant/year)
1	Greenland	350	603	10 595 305
2	French Guiana	2 895	134	680 203
3	Iceland	1 940	170	574 588
4	Guyana	2 387	241	320 667
5	Congo	1 646	910	281 618
6	Surinam	2 331	122	250 501
7	Papua New Guinea	3 142	801	146 651
8	Gabon	1 831	164	126 154
9	Canada	537	2 902	93 549
10	Solomon Islands	3 028	45	90 298
11	Norway	1 414	382	81 967
12	Liberia	2 391	232	80 573
13	New Zealand	1 732	327	78 146
14	Peru	1 738	1 913	69 446
15	Bolivia	1 146	623	67 472
16	Paraguay	1 130	336	65 076
17	Belize	1 705	19	61 566
18	Chile	1 522	922	57 291
19	Laos	1 834	334	56 836
20	Colombia	2 612	2 132	46 302
25	Brazil	1 782	8 233	44 081
62	United States of America	715	3 051	10 293
89	Mexico	760	458	4 312
101	France	867	204	3 320
107	Turkey	593	214	2 891

NOTE: 1 km³ = 1 000 hm³ = 1 billion m³.
SOURCE: FAO. Information System on Water and Agriculture, Aquastat. www.fao.org/AG/AGL/aglw/aquastat/main/index.stml. June 2008.
CONAGUA. Deputy Director General's Office for Technical Affairs. 2008.

Climate change

Climate change is expected to intensify the current stress placed on water resources, as a consequence of the population growth, economic activities, uses of soil and in particular urbanization processes. Regionally, the mountain snowcaps, glaciers and small icecaps perform a crucial function as regards freshwater availability. According to projections of the International Panel on Climate Change (IPCC), the generalized loss of landmass of the glaciers and the shrinking of the snow cover in recent decades will accelerate in the 21st century, thus reducing the availability of water and the hydropower potential, and altering the seasonality of the flows in the regions supplied with snow water from the main mountain ranges, currently home to one sixth of the world's population.

In the following table, the projected impacts as a consequence of the effects of climate change are shown.

T8.5 Projected regional impacts on the water sector as a consequence of the effects of climate change	
Africa	By 2020, between 75 and 250 million of people are projected to be exposed to increased water stress due to climate change. By 2020, in some countries, yields from rain-fed agriculture could be reduced by up to 50%. Agricultural production, including access to food, in many African countries is projected to be severely compromised. This would further adversely affect food security and exacerbate malnutrition. Towards the end of the 21st century, projected sea level rise will affect low-lying coastal areas with large populations. The cost of adaptation could amount to at least 5 to 10% of Gross Domestic Product (GDP). By 2080, an increase of 5 to 8% of arid and semi-arid land in Africa is projected under a range of climate scenarios (TS).
Asia	By the 2050s, freshwater availability in Central, South, East and South-East Asia, particularly in large river basins, is projected to decrease. Coastal areas, especially heavily populated megadelta regions in South, East and South-East Asia, will be at greatest risk due to increased flooding from the sea and, in some megadeltas, flooding from the rivers. Climate change is projected to compound the pressures on natural resources and the environment associated with rapid urbanisation, industrialisation and economic development. Endemic morbidity and mortality due to diarrhoeal disease primarily associated with floods and droughts are expected to rise in East, South and South-East Asia due to projected changes in the hydrological cycle.
Australia and New Zealand	By 2020, significant loss of biodiversity is projected to occur in some ecologically rich sites, including the New Zealand Great Barrier Reef and Queensland Wet Tropics. By 2030, water security problems are projected to intensify in southern and eastern Australia and, in New Zealand, in Northland and some eastern regions. By 2030, production from agriculture and forestry is projected to decline over much of southern and eastern Australia, and over parts of eastern New Zealand, due to increased drought and fire. However, in New Zealand, initial benefits are projected in some other regions. By 2050, ongoing coastal development and population growth in some areas of Australia and New Zealand are projected to exacerbate risks from sea level rise and increases in the severity and frequency of storms and coastal flooding.
Europe	Climate change is expected to magnify regional differences in Europe's natural resources and assets. Negative impacts will include increased risk of inland flash floods and more frequent coastal flooding and increased erosion (due to storminess and sea level rise). Mountainous areas will face glacier retreat, reduced snow cover and winter tourism, and extensive species losses (in some areas up to 60% under high emissions scenarios by 2080). In southern Europe, climate change is projected to worsen conditions (high temperatures and drought) in a region already vulnerable to climate variability, and to reduce water availability, hydropower potential, summer tourism and, in general, crop productivity. Climate change is also projected to increase the health risks due to heat waves and the frequency of wildfires.
Latin America	By mid-century, increases in temperature and associated decreases in soil water are projected to lead to gradual replacement of tropical forest by savanna in eastern Amazonia. Semi-arid vegetation will tend to be replaced by arid-land vegetation. There is a risk of significant biodiversity loss through species extinction in many areas of tropical Latin America. Productivity of some important crops is projected to decrease and livestock productivity to decline, with adverse consequences for food security. In temperate zones, soybean yields are projected to increase. Overall, the number of people at risk of hunger is projected to increase (TS; medium confidence).
North America	Warming in western mountains is projected to cause decreased snowpack, more winter flooding and reduced summer flows, exacerbating competition for over-allocated water resources. In the early decades of the century, moderate climate change is projected to increase aggregate yields of rain-fed agriculture by 5 to 20%, but with important variability among regions. Major challenges are projected for crops that are near the warm end of their suitable range or which depend on highly utilized water resources. Cities that currently experience heat waves are expected to be further challenged by an increased number, intensity and duration of heat waves during the course of the century, with potential for adverse health impacts. Coastal communities and habitats will be increasingly stressed by climate change impacts interacting with development and pollution.
Polar Regions	The main projected biophysical effects are reductions in thickness and extent of glaciers, ice sheets and sea ice, and changes in natural ecosystems with detrimental effects on many organisms including migratory birds, mammals and higher predators. For human communities in the Arctic, impacts, particularly those resulting from changing snow and ice conditions, are projected to be mixed. Detrimental impacts would include those on infrastructure and traditional indigenous ways of life. In both polar regions, specific ecosystems and habitats are projected to be vulnerable, as climatic barriers to species invasions are lowered.

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T8.5 Projected regional impacts on the water sector as a consequence of the effects of climate change

Small Islands	Sea level rise is expected to exacerbate inundation, storm surge, erosion and other coastal hazards, thus threatening vital infrastructure, settlements and facilities that support the livelihood of island communities. Deterioration in coastal conditions, for example through erosion of beaches and coral bleaching, is expected to affect local resources. By mid-century, climate change is expected to reduce water resources in many small islands, e.g. in the Caribbean and Pacific, to the point where they become insufficient to meet demand during low-rainfall periods. With higher temperatures, increased invasion by non-native species is expected to occur, particularly on mid- and high-latitude islands.

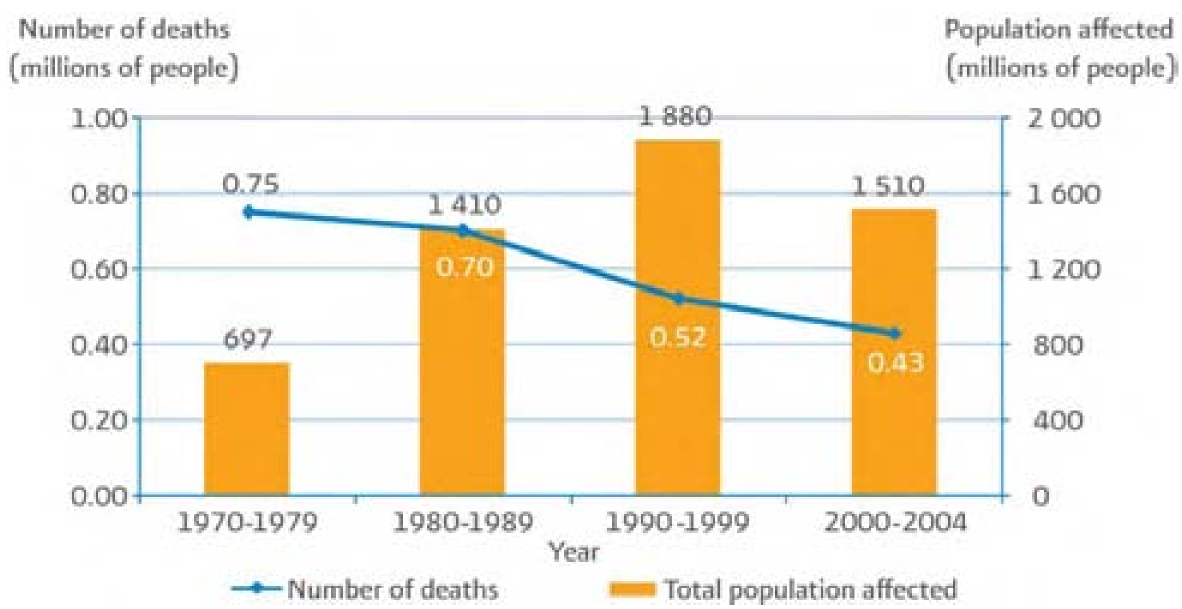
SOURCE: WMO, UNDP, IPCC. Climate Change 2007. Synthesis Report. 2008.

In the case of Mexico, climate change is an ongoing process that will have important repercussions on the availability of water resources. The various estimates agree on temperature increases, towards the end of the next century, between three and four degrees centigrade.

Extreme meteorological phenomena

Developing countries are more affected by disasters; their losses are estimated at five times more per unit of Gross Domestic Product (GDP) as compared to developed countries. These losses set developing countries back years in terms of the progress and socio-economic development achieved through great effort.

G8.4 Number of deaths and people affected by water-related disasters, 1970-2004

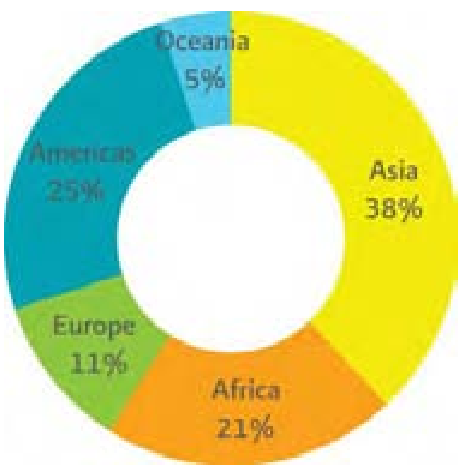


NOTE: The disasters indicated in this figure include floods, storms, avalanches, droughts, famine, water-related epidemics and water-related technological disasters (such as traffic accidents due to water).
SOURCE: UNESCO-WWAP, Water, a Shared Responsibility. 2nd World Water Development Report, UNESCO-WWAP and Berghahns Books, France, 2006.

According to the World Meteorological Organization (WMO), in the period from 2000 to 2004, 1 942 water-related disasters were registered, in which 427 000 people lost their lives and more than 1 510 million people were affected. The following figure shows the populated killed and affected by water-related disasters.

In the period between 1996 and 2005, around 80% of all natural disasters were water-related. In this period, disasters related with tidal waves accompanied by hurricanes, as well as the tsunami that occurred in the Indian Ocean in 2004, threatened an increasingly large number of people around the world. The following figure shows the geographic distribution of water-related natural disasters.

G8.5 Geographic distribution of water-related disasters, 1990-2004



SOURCE: UNESCO-WWAP, Water, a Shared Responsibility.
2nd World Water Development Report.
France, 2006.

Between 1992 and 2001, it has been calculated that the losses derived from water-related disasters could be estimated at 446 billion US dollars, meaning a 65% economic loss owing to natural disasters.

8.3 Uses of Water and Infrastructure

In the last century, the world population tripled, whereas water withdrawals multiplied six-fold. This situation has contributed to the increase in water stress around the world. In the following table, the countries of the world with the highest per capita water withdrawal are shown, in which it can be seen that Mexico is ranked 36th.

T8.6 Countries with the highest per capita water withdrawal, 2005

No.	Country	Total withdrawal (km³/year)	Per capita withdrawal (m³/inhabitant/year)	Agricultural (%)	Public supply (%)	Industrial[a] (%)
1	Turkmenistan	24.6	5 071	97.5	1.7	0.8
2	Uzbekistan	58.3	2 337	93.2	4.7	2.1
3	Kazakhstan	35.0	2 311	81.8	1.7	16.5
4	Guyana	1.6	2 182	97.6	1.8	0.6
5	Azerbaijan	17.3	2 077	67.5	4.8	27.7
6	Kyrgyzstan	10.1	2 019	93.7	3.2	3.1
7	Tajikistan	12.0	1 746	91.6	3.7	4.7
8	United States of America	479.3	1 617	41.3	12.7	46.0
9	Iraq	42.7	1 482	92.2	3.2	4.6
10	Canada	46.0	1 482	11.8	19.6	68.6
11	Surinam	0.7	1 376	92.5	4.5	3.0
12	Bulgaria	10.5	1 357	18.8	3.0	78.2
13	Thailand	87.1	1 333	95.0	2.5	2.5
14	Ecuador	17.0	1 303	82.2	12.5	5.3
15	Australia	23.9	1 156	75.3	14.7	10.0
16	Syria	20.0	1 110	94.9	3.3	1.8
17	Pakistan	169.4	1 090	96.0	1.9	2.1
18	Rumania	23.2	1 072	57.0	8.6	34.4
19	Portugal	11.3	1 067	78.2	9.6	12.2
20	Iran	72.9	1 064	90.9	6.8	2.3
36	Mexico	78.9	743	76.8	14.1	9.1
45	France	40.0	669	9.8	15.7	74.5
59	Turkey	37.5	534	74.2	14.8	11.0
85	Brazil	59.3	331	61.8	20.3	18.0
92	South Africa	12.5	268	62.7	31.2	6.0

NOTES: The data is from the last available year in the period from 2000 to 2007.
1 km³ = 1 000 hm³ = 1 billion m³.
[a] Includes the use of water in thermoelectric plants.
SOURCE: FAO. Information System on Water and Agriculture, Aquastat. www.fao.org/AG/AGL/aglw/aquastat/main/index.stml. June 2008.
CONAGUA. Deputy Director General's Office for Water Management.

Industrial use

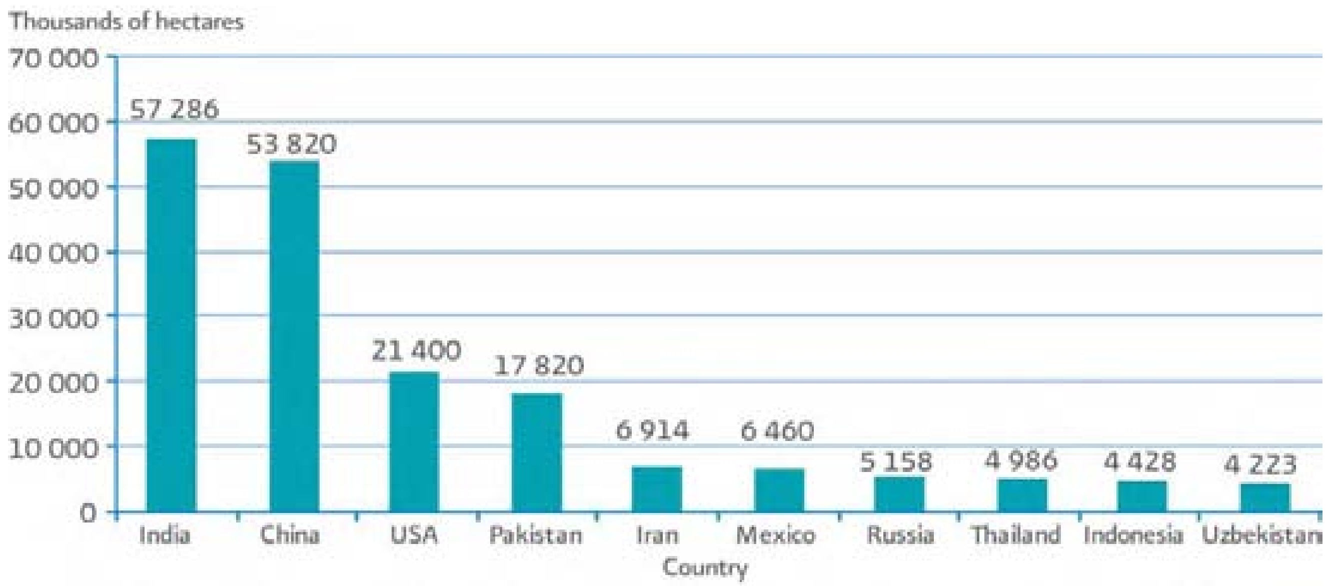
Industry is the motor of growth and economic development in many developed countries. In the East Asia and Pacific region, industry currently generates 48% of the total GDP, and this proportion is increasing. On the other hand, in developing countries, the proportion of GDP grew from 22 to 26% between 1998 and 2002. Around 20% of water is employed in industry, this quantity being the equivalent of a consumption of 130 m³/person/year. Of this quantity, more than half is used in thermoelectric stations in their cooling processes. Among the greatest consumers of water are petrol plants, the metal, paper and wood industries, food processing and the manufacturing industry.

Agricultural use

Irrigation is fundamental to meet the world's food requirements. Only 17% of the area with irrigation is watered, but produces more than a third of the world's food. Additionally, in recent years agriculture has used greater quantities of fertilizers, and chemicals used in irrigation have polluted soils.

Mexico is in 6th place worldwide in terms of the surface area with irrigation infrastructure, the first places being occupied by China, India and the United States of America, as shown in the following figure:

G8.6 The ten countries with the greatest surface area with irrigation infrastructure, 2005
(thousands of hectares)



NOTE: The data is from 2004 or the last available year in cases in which the data does not exist for 2004.
SOURCE: FAO. Information System on Water and Agriculture, Aquastat. www.fao.org/AG/AGL/aglw/aquastat/main/index.stml. June 2008.

T8.7 Countries with the greatest surface area with irrigation infrastructure, 2005

No.	Country	Cultivatable surface (thousands of hectares)	Surface area with irrigation infrastructure[a] (thousands of hectares)	Irrigation infrastructure as regards the cultivatable surface (%)
1	India	169 650	57 286	34
2	China	156 327	53 820	34
3	United States of America	177 178	21 400	12
4	Pakistan	22 070	17 820	81
5	Iran	18 107	6 914	38
6	Mexico	27 600	6 460	23
7	Russia	123 581	5 158	4
8	Thailand	17 800	4 986	28
9	Indonesia	36 600	4 428	12
10	Uzbekistan	5 040	4 223	84
11	Turkey	26 606	4 186	16
12	Bangladesh	8 411	3 751	45
13	Kazakhstan	22 500	3 556	16
14	Iraq	6 010	3 525	59
15	Spain	18 630	3 478	19
16	Egypt	3 520	3 422	97
17	Japan	4 692	3 128	67

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T8.7 Countries with the greatest surface area with irrigation infrastructure, 2005

No.	Country	Cultivatable surface (thousands of hectares)	Surface area with irrigation infrastructure[a] (thousands of hectares)	Irrigation infrastructure as regards the cultivatable surface (%)
18	Romania	9 828	3 082	31%
19	Vietnam	8 950	3 000	34%
20	Brazil	66 600	2 870	4%
25	France	19 635	2 634	13%
36	South Africa	15 712	1 498	10%

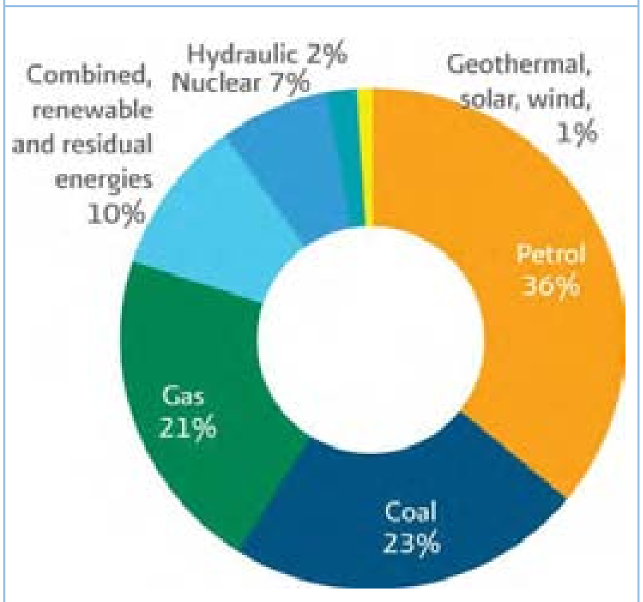
NOTE: [a] The data is from 2005 or the last available year in the cases in which no data exists for 2005.
SOURCE: FAO. Information System on Water and Agriculture, Aquastat. www.fao.org/AG/AGL/aglw/aquastat/main/index.stml. June 2008.
CONAGUA. Deputy Director General's Office for Hydro-agricultural Infrastructure.

Hydropower generation

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

The 2nd United Nations' World Water Development Report indicates that, despite the percentage of hydropower in the total world energy supply being only 2.2% in 2002, hydropower constitutes 19% of all electricity generated. The following figure shows the world energy supply by the type of source.

G8.7 Total primary energy supply by source, 2002



SOURCE: UNESCO-WWAP, Water, a Shared Responsibility.
2nd World Water Development Report,
UNESCO-WWAP and Berghahns Books, France, 2006.

Storage dams in the world

The water storage capacity for various uses and for flood control is directly proportional to the degree of hydraulic development of countries. An indicator that allows this degree to be appreciated is the per capita storage capacity. It is worth mentioning that Mexico has the 19th highest storage capacity in the world.

T8.8 Dams per selected country, by per capita storage capacity

No.	Country	Storage capacity (km^3)	Per capita storage capacity (m^3/ inhabitant)	Number of large dams
1	Canada	857	26 778	793
2	Norway	49	9 889	335
3	Ghana	150	7 152	5
4	Venezuela	155	5 975	74
5	Uruguay	18	5 948	6
6	Australia	93	4 663	486
7	Sweden	38	4 243	190
8	New Zealand	17	4 131	86
9	Finland	19	3 806	55
10	Argentina	130	3 515	101
11	Brazil	550	3 110	594
12	Egypt	167	2 456	6
13	United States of America	553	1 899	6 575
14	Honduras	13	1 841	9
15	Turkey	109	1 538	625
16	Spain	56	1 377	1 196
17	Democratic Republic of Congo	5	1 319	14
18	Thailand	79	1 267	204
19	Mexico	150	1 189	667

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T8.8 Dams per selected country, by per capita storage capacity

No.	Country	Storage capacity (km^3)	Per capita storage capacity (m^3/ inhabitant)	Number of large dams
20	Greece	13	1 164	46
27	South Africa	31	665	539
42	France	16	266	569

NOTE: 1 km^3 = 1 000 hm^3 = 1 billion m^3.
SOURCE: CONAGUA. Deputy Director General's Office for Planning.
Produced based on data from:
ICOLD. World Register of Dams. France, 2003.
World Commission of Dams. Dams and Development: A New Framework for Decision-making, Annex V, South Africa, 2000.

Water footprint

One way of measuring the impact of human activities on water resources is the so-called water footprint, which can be calculated by adding up the water used by each person for his or her activities and which is necessary to produce the goods and services that they consume.

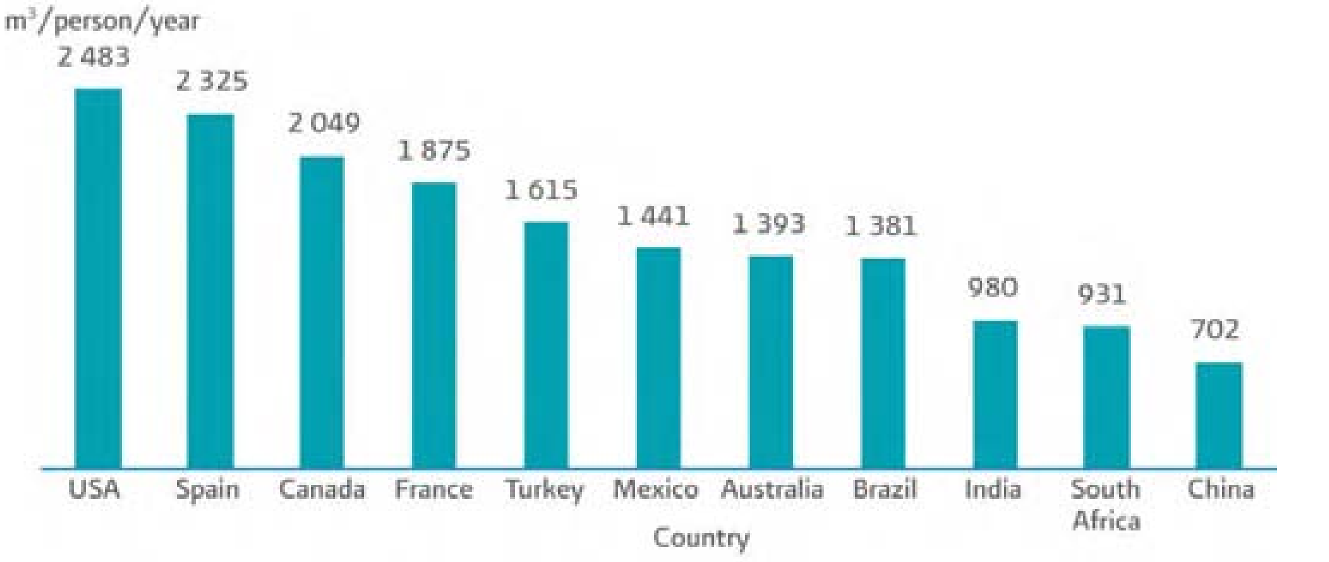
The four main factors that determine the water footprint of a country are: the level of consumption, the type of consumption (for example the quantity of meat consumed by each person), the climate and the efficiency with which water is used. According to this concept, each human being on average uses 1 240 cubic meters of water per year; however the differences between countries are significant. For example, in Mexico the water footprint is 1 441 cubic meters of water per person per year, whereas in the United States of America (the country with the largest water footprint), 2 483 are required, and in China (one of the countries with the smallest water footprints), the figure is 702.

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

Virtual water

A concept that is closely linked to the water footprint is that of virtual water. The virtual water content of a product is the quantity of water that was employed in its productive process. Trade between countries implies a flow of virtual water between them, which corresponds 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 cubic kilometers

G8.8 Water footprint of selected countries, 1997-2001
(m^3/person/year)



NOTE: Water footprint = The domestic consumption of water resources – the virtual water exports + the virtual water imports.
SOURCE: Hoekstra, Arjen Y., Globalization of Water: Sharing the Planet's Freshwater Resources, 2008.

(km^3) per year, of which approximately 80% corresponds to agricultural products, the remainder corresponding to industrial products.

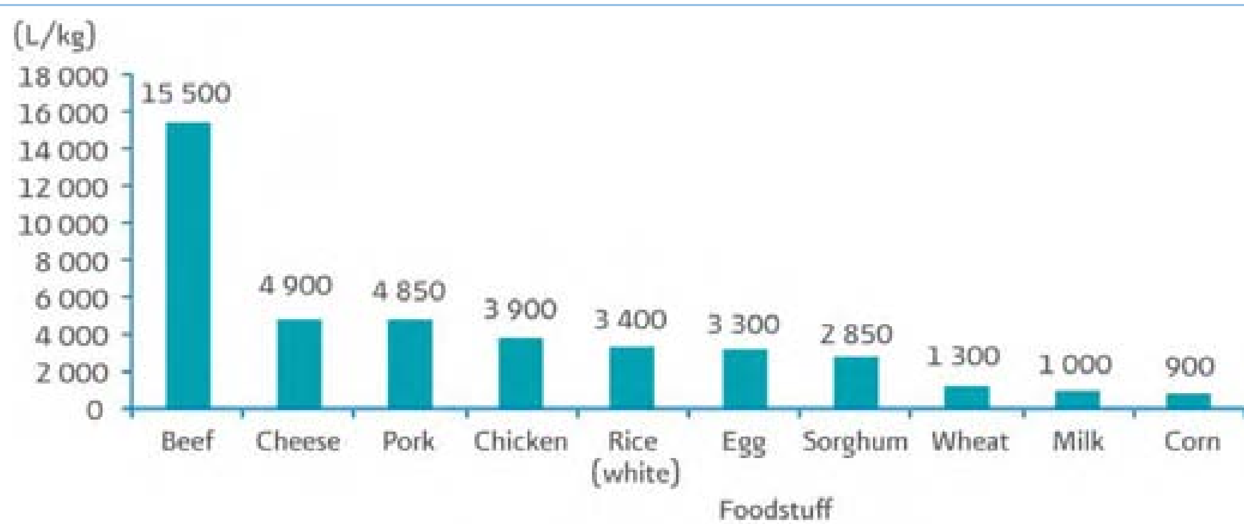
Growing one kilogram of corn requires on average in the world 900 liters of water, whereas growing one kilogram of white rice requires 3 400 liters. However, the production of one kilogram of beef requires on average 15 500 liters, which includes the water drunk by the animal throughout its lifetime and the water required to grow the grain that serves as its food. The graphic G8.9 shows the average virtual water content of various products. The values are different in every country, depending on the climatic conditions and the efficiency in the use of water.

Importing virtual water may be an option to reduce the problems of water scarcity in some countries. The 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

In the table T8.9, the countries with the highest water stress are shown, this calculation being made by dividing their withdrawal by the availability. It should be noted that, as a result of their low availability, the Middle East countries figure among those that suffer from the highest water stress, whereas Mexico is in 55th place out of 155 evaluated according to this indicator.

G8.9 Average volume of water used to produce selected foodstuffs (L/kg)



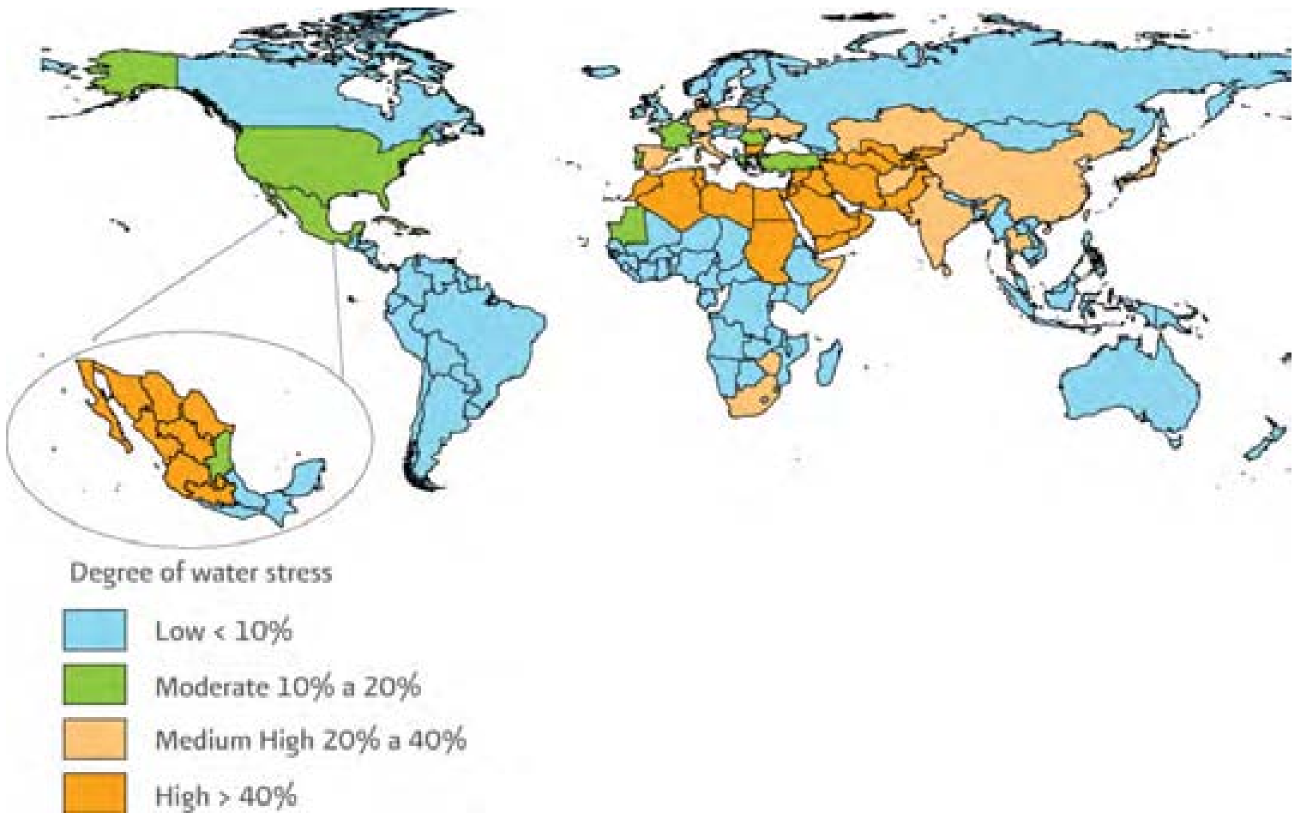
SOURCE: Hoekstra, Arjen Y., Globalization of Water: Sharing the Planet's Freshwater Resources, 2008.

T8.9 Countries with the highest degree of water stress, 2008

No.	Country	Availability (km³)	Total withdrawal (km³)	Water stress (%)
1	Kuwait	0.02	0.45	2 250
2	United Arab Emirates	0.15	2.31	1 540
3	Arabia Saudi Arabia	2.40	17.32	722
4	Libya	0.60	4.27	711
5	Qatar	0.05	0.29	547
6	Bahrain	0.12	0.30	259
7	Yemen	4.10	6.63	162
8	Oman	0.99	1.35	137
9	Israel	1.67	2.04	122
10	Malta	0.05	0.06	120
11	Egypt	58.30	68.30	117
12	Jordan	0.88	1.02	116
13	Uzbekistan	50.41	58.33	116
14	Barbados	0.08	0.08	100
15	Turkmenistan	24.72	24.64	100
16	Pakistan	222.67	169.38	76
17	Syria	26.26	19.95	76
18	Tajikistan	15.98	11.96	75
19	Tunisia	4.46	2.64	58
20	Sudan	64.50	37.31	58
41	South Africa	50.00	12.50	25
52	France	203.70	39.96	20
54	Turkey	229.30	37.52	18
55	Mexico	458.10	78.95	17
58	United States of America	2071.00	479.29	16

NOTE: 1 km³ = 1 000 hm³ = 1 billion m³.
SOURCE: CONAGUA. Deputy Director General's Office for Planning. Produced based on data from:
FAO. Information System on Water and Agriculture, Aquastat. www.fao.org/AG/AGL/aglw/aquastat/main/index.stml. June 2008.
CONAGUA. Deputy Director General's Office for Technical Affairs. Deputy Director General's Office for Water Management.

M8.1 Water stress



SOURCE: CONAGUA. Deputy Director General's Office for Planning. Produced based on data from:
FAO. Information System on Water and Agriculture, Aquastat. www.fao.org/AG/AGL/aglw/aquastat/main/index.stml. June 2008.
CONAGUA. Deputy Director General's Office for Technical Affairs.

Drinking water, sanitation and wastewater treatment

For 2004, according to the World Health Organization (WHO), 1 100 million people in the world, or 17% of the population of the planet, were lacking access to drinking water services, the most affected being the inhabitants of the Asian and African continents.

Likewise, as regards sanitation, in 2004 it was calculated that 2 400 million inhabitants did not have access to this service, or 42% of the world population, Asia and Africa again being the most disadvantaged regions of the world.

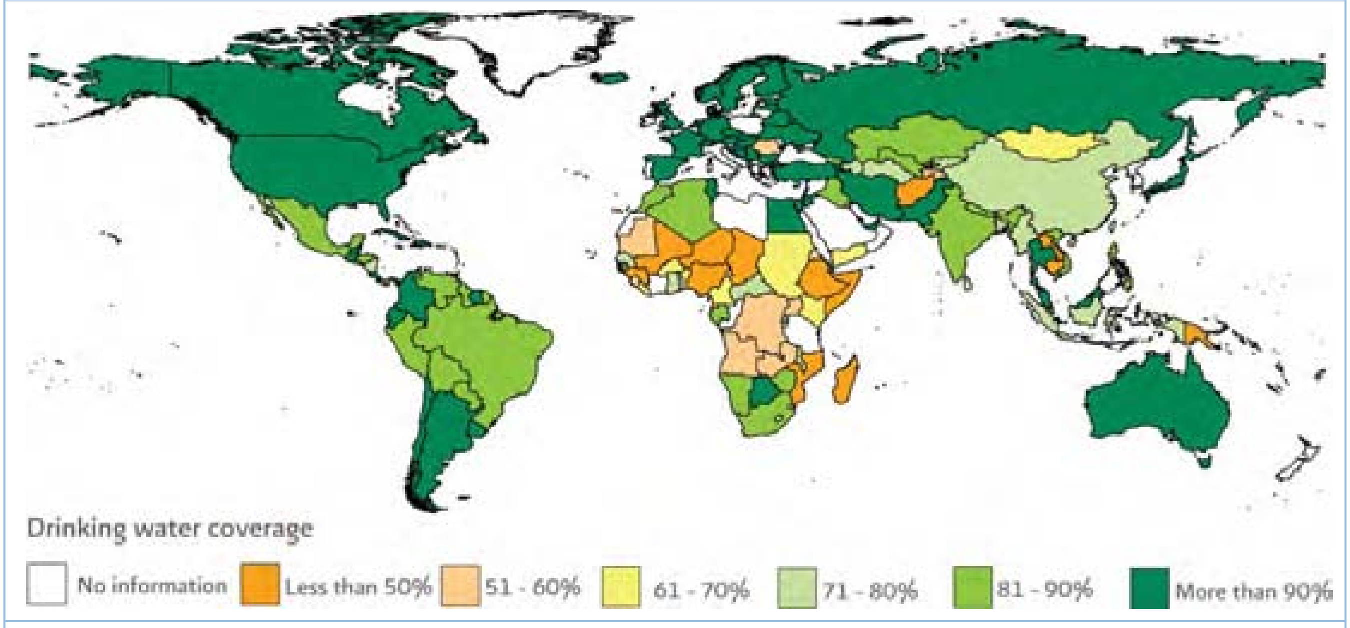
The WHO also estimates that the propagation of diarrhoeal diseases, malaria, hepatitis and trachoma is closely linked to the provision of drinking water and sanitation services, young children being the most at threat. Extending the coverage of the service would therefore contribute to reducing mortality through these diseases. In the following table, the countries with the highest coverage rates of drinking water, sanitation and wastewater treatment are shown. It should be mentioned that Mexico is ranked 90th out of 184 countries in terms of drinking water, 67th out of 172 for sanitation and 39th out of 56 for wastewater treatment.

T8.10 Countries with the highest drinking water coverage, 2004

No.	Country	Continent	Drinking water coverage (%)
1	Germany	Europe	100
2	Andorra	Europe	100
3	Aruba	North and Central America	100
4	Australia	Oceania	100
5	Austria	Europe	100
6	Barbados	North and Central America	100
7	Belarus	Europe	100
8	Canada	North and Central America	100
9	Cyprus	Asia	100
10	Croatia	Europe	100
11	Denmark	Europe	100
12	United Arab Emirates	Asia	100
13	Slovakia	Europe	100
14	Spain	Europe	100
15	United States of America	North and Central America	100
16	Estonia	Europe	100
17	Finland	Europe	100
18	France	Europe	100
19	Guam	Oceania	100
20	Iceland	Europe	100
62	Turkey	Asia	96
88	Brazil	South America	90
90	Mexico	North and Central America	89
91	South Africa	Africa	89

NOTES: The data is from 2004 or the last available year in the cases in which the data does not exist for 2004.
The term "drinking water" refers to the access to improved water, which includes:
There are 45 countries with 100% coverage of drinking water. Here we present the first 20 in alphabetic order in Spanish.
SOURCE: WHO, UNICEF, Joint Monitoring Programme for Water Supply and Sanitation, Switzerland, 2006.
INEGI, II Census of Water Capture, Treatment and Water Supply. Mexico, 2004.

M8.2 Drinking water coverage in the world, 2004



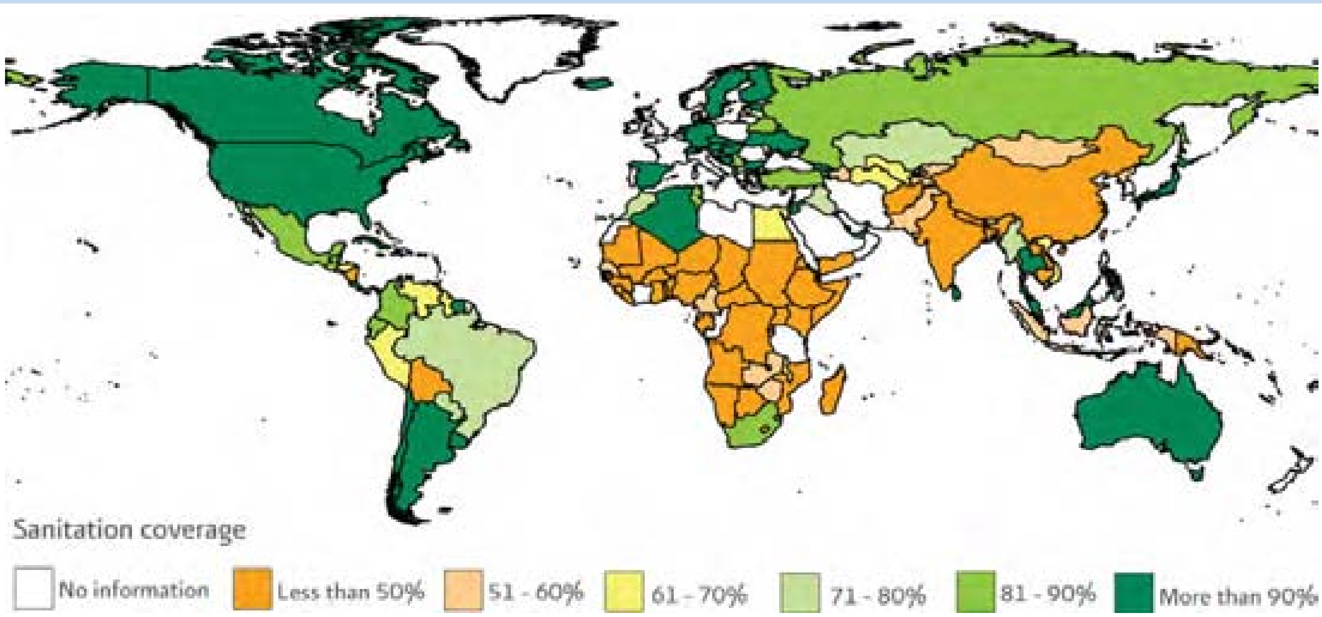
SOURCE: CONAGUA. Deputy Director General's Office for Planning.
Produced based on data from WHO, UNICEF, Joint Monitoring Programme for Water Supply and Sanitation, Switzerland, 2006.

T8.11 Countries with the highest sanitation coverage, 2004

No.	Country	Continent	Sanitation coverage (%)
1	Germany	Europe	100
2	Andorra	Europe	100
3	Autralia	Oceania	100
4	Austria	Europe	100
5	Barbados	North and Central America	100
6	Canada	North and Central America	100
7	Cyprus	Asia	100
8	Croacia	Europe	100
9	Spain	Europe	100
10	United States of America	North and Central America	100
11	Finland	Europe	100
12	Iceland	Europe	100
13	Cook Islands	Oceania	96
14	Japan	Asia	100
15	Monaco	Europe	100
16	Montserrat	Central America and Caribbean	100
17	Netherlands	Europe	100
18	Qatar	Asia	100
19	Samoa	Oceania	98
20	Singapore	Asia	100
62	Turkey	Asia	88
67	Mexico	North and Central America	86
68	South Africa	Africa	86
85	Brazil	South America	75

NOTES: There are 26 countries with 100% coverage. Here we present the first 20 in alphabetic order in Spanish.
There is no existing data for France, among other countries.
SOURCE: WHO, UNICEF, Joint Monitoring Programme for Water Supply and Sanitation, Switzerland, 2006.
INEGI, II Census of Water Capture, Treatment and Water Supply. Mexico, 2004.

M8.3 Sanitation coverage in the world, 2004

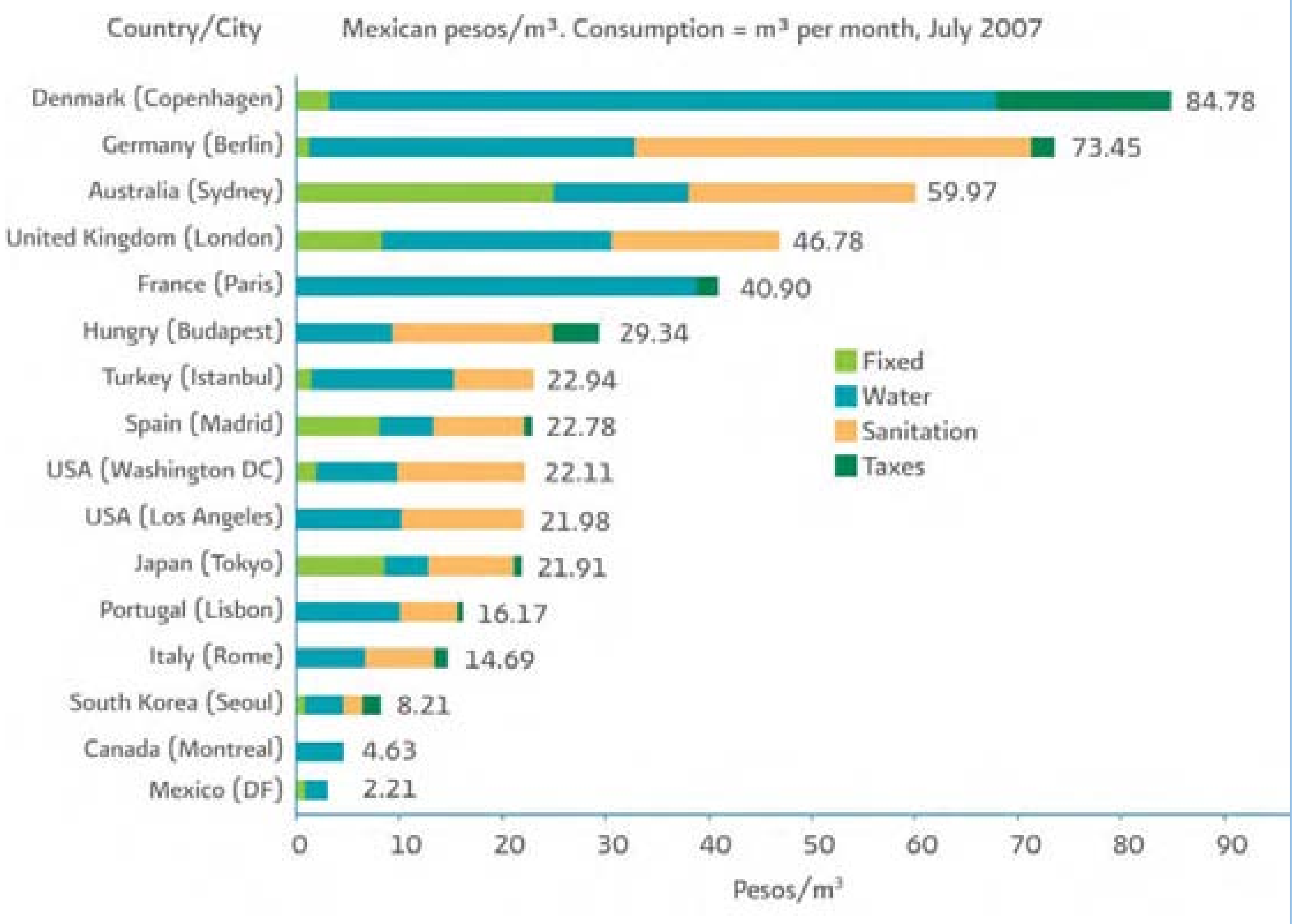


SOURCE: CONAGUA. Deputy Director General's Office for Planning.
Produced based on data from WHO, UNICEF, Joint Monitoring Programme for Water Supply and Sanitation, Switzerland, 2006.

Drinking water and sanitation tariffs

In the following figure the drinking water and sanitation tariffs for selected cities in the world are shown, for a domestic consumption of 15 m³/month, as well as the taxes associated with the service.

G8.10 Domestic drinking water and sanitation tariffs and the taxes associated with the service, in selected world cities, Mexican pesos/m³
(tariff for a consumption of 15 m³/month)



SOURCE: Global Water Intelligence. 2007.

Water and health

Estimates from the World Health Organization (WHO) indicate that every year approximately 1.5 million people in the world die from diarrhoeal diseases. The majority of these people are children under 5 years old, mainly in developing countries. These diarrhoeal diseases include cholera, typhoid and dysentery, among others, all of them related with "faecal-oral" transmission. The majority of these deaths could be avoided with actions focused on drinking water, sewerage and sanitation.

It is estimated that by improving sanitation, the frequency of diarrhoeal diseases is reduced by 32%, whereas improvements in water supply have an impact of 25%. Improvements in water quality reduce diarrhoeal diseases by 31%.

It should also be mentioned that water and sanitation actions, hygiene measures, among them education on the subject and the insistence on the habit of washing one's hands, reduce diarrhoeal diseases by 37%.

It is important to bear in mind that actions in the fields of water, sanitation and hygiene are closely related and produce a joint effect. The effect may vary according to local circumstances. As well as diarrhoeal diseases, intestinal nematode infections, malnutrition, schistosomiasis and Japanese encephalitis are the cause of death of approximately 800 000 additional people in the world every year. These diseases are related with the supply of drinking water and sanitation, and hygiene.

T8.12 Deaths related with water, sanitation and hygiene in 2002
(thousands of people)

Disease or problem	Children 0-14 years old	Developed countries	Developing countries	Total
Diarrhea	1 370	15	1 508	1 523
Intestinal nematode infections	8	0	12	12
Malnutrition (only related to proteins and energy)	71	0	71	71
Consequences of malnutrition	792	9	783	792
Schistosomiasis	0	0	15	15
Subtotal of water-, sanitation- and hygiene-related diseases	2 241	24	2 389	2 413
Malaria	482	0	526	526
Dengue	14	0	18	18
Japanese encephalitis	7	0	13	13
Subtotal of events owing to a lack of management of resources	503	0	557	557
Drowning	106	33	244	277
Subtotal owing to a lack of security in appropriate water means	106	33	244	277
Other types of contagious deaths	162	15	312	327
Total deaths	**3 012**	**72**	**3 502**	**3 574**

SOURCE: WHO, UNICEF. Safer water, better health. Costs, benefits and sustainability of interventions to protect and promote health. 2008.

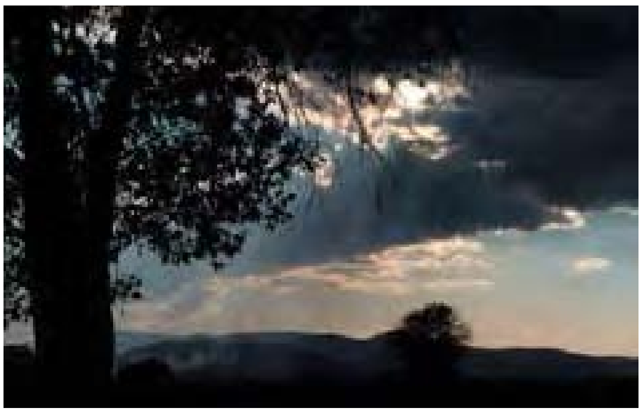
According to the WHO, the country with the largest number of deaths through water-related problems is Angola, with almost 25% of all its deaths. Mexico is ranked 128th out of 192 countries analyzed. In the following table the countries with the highest percentage of deaths through water-related diseases and problems are shown.

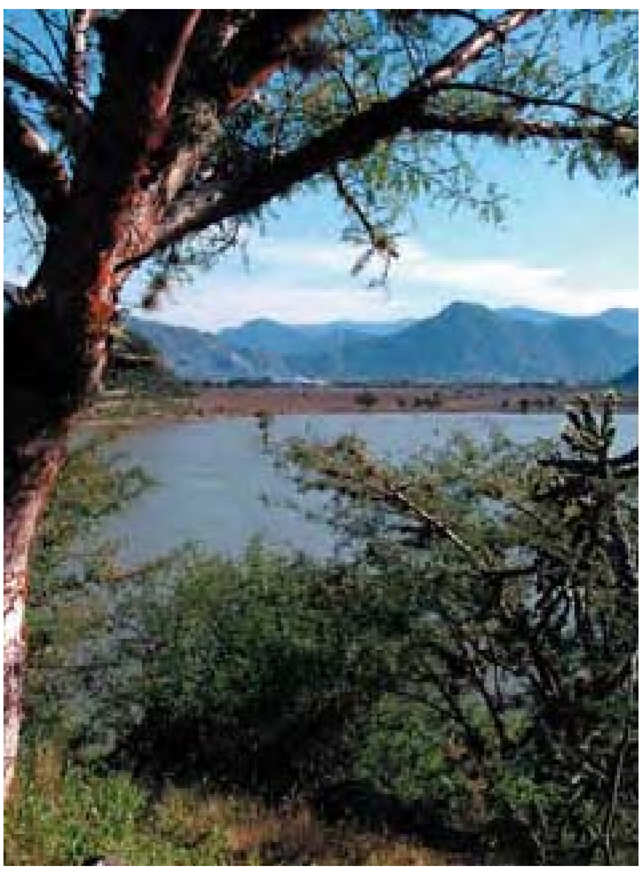
T8.13 Countries with the highest proportion of water-related deaths, 2002

No.	Country	% of water-related deaths	Number of deaths (people)
1	Angola	24.1	73 900
2	Nigeria	23.0	56 200
3	Mali	20.9	50 800
4	Democratic Republic of Congo	20.4	201 300
5	Burkina Faso	19.9	49 800
6	Madagascar	19.7	39 600
7	Sierra Leona	19.5	25 700
8	Benin	19.0	16 600
9	Chad	18.5	27 500
10	Liberia	17.8	12 400
11	Guinea	17.7	20 200
12	Mauritania	17.7	7 100
13	Guinea-Bissau	17.0	4 500
14	Nigeria	16.7	335 200
15	Senegal	16.5	17 000
16	Afghanistan	16.2	78 500
17	Mozambique	16.2	62 500
18	Rwanda	16.1	21 200
19	Yemen	16.0	27 500
20	Uganda	15.8	61 600
123	Brazil	2.3	28 700
126	Turkey	2.0	8 600
128	Mexico	1.9	9 000
160	United States of America	0.4	8 700
180	France	0.2	1 000

SOURCE: WHO, UNICEF. Safer water, better health. Costs, Benefits and Sustainability of Interventions to Protect and Promote Health. 2008.

Investments in drinking water and sanitation have economic benefits that have been estimated worldwide at 7 billions dollars every year in savings in the costs of health service institutions and 340 million in individual expenses. 320 million productive days gained each year in the 15- to 59-year age group, an extra 272 million school attendance days a year, and an added 1.5 billion healthy days for children under five years of age, together would represent productivity gains of 9.9 billion dollars a year. As regards time savings resulting from nearby access to water, an estimated 63 billion dollars a year would be saved. Finally, avoiding deaths would have an impact amounting to 3.6 billion dollars a year, based on discounted future earnings. These figures added up give a total payback of 84 billion dollars a year, compared to 11.3 billion dollars in investments required to meet the Millennium Development Goals. All of the above information comes from the WHO.





Annexes

Annex A: Relevant data by Hydrological-Administrative Region

Hydrological-Administrative Region:	1. Baja California Peninsula
River Basin Organization based in:	Mexicali, Baja California

Contextual information

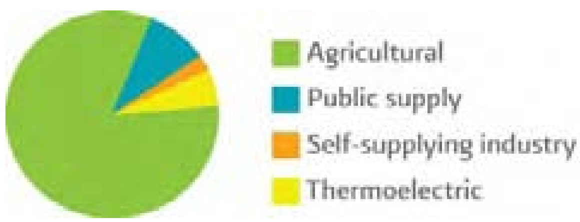
2007 population (inhabitants)

Total	3 580 948	
Urban	3 292 083	
Rural	288 865	
Number of municipalities	10	
Population in 2030	5 915 393	inhabitants

Water availability, 2007

Normal annual precipitation 1971-2000	168.3 mm
Per capita availability, 2007	1 289 m³/inhabitant/year
Surface runoff	3 367 hm³/year
Aquifer recharge	1 249 hm³/year
Number of aquifers	87
Per capita availability, 2030	780 m³/inhabitant/year

Offstream water uses, 2007



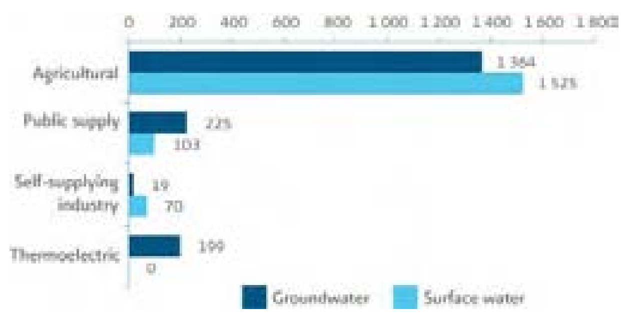
Agricultural	2 889	hm³/year	(82.5%)
Public supply	327	hm³/year	(9.3%)
Self-supplying industry	88	hm³/year	(2.5%)
Thermoelectric	199	hm³/year	(5.7%)
Total	3 504	hm³/year	(100.0%)

Instream water uses, 2007

Hydroelectric (volume declared)	0	hm³/year

Origen of the water used, 2007

Surface water	1 697 hm³/year (48.4%)
Groundwater	1 807 hm³/year (51.6%)



Drinking water and sanitation, 2005

Drinking water coverage

Regional	92.9	%
Urban	95.0	%
Rural	69.7	%

Sanitation coverage

Regional	89.0	%
Urban	92.2	%
Rural	55.3	%

Treatment plants (up to December 2007)

Municipal treatment plants

Number in operation	38	
Installed capacity	11.171	m^3/s
Flow treated	6.379	m^3/s

Municipal wastewater

Number in operation	41	
Installed capacity	7.71	m^3/s
Flow treated	5.77	m^3/s

Irrigation Districts, 2007

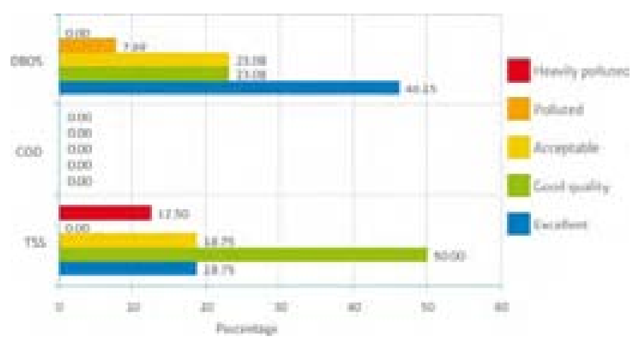
Number of Irrigation Districts	2	
Total surface area of the Irrigation Districts	246 906	hectares

Surface water quality, 2007

Number of water quality monitoring sites

BOD_5	13
COD	0
TSS	16

Percentage distribution of the monitoring sites by indicator and classification scale of water quality



Water bodies with sites classified as strongly polluted by BOD_5, COD and/or TSS: Tijuana River and Abelardo L. Rodriguez Dam.

Hydrological-Administrative Region:	II. Northwest
River Basin Organization based in:	Hermosillo, Sonora

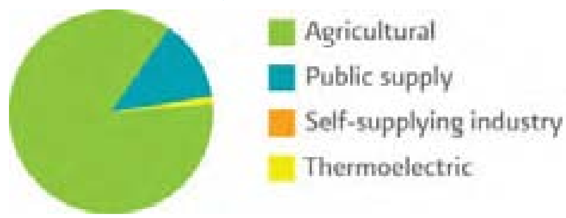
Contextual information

2007 population (inhabitants)		
Total	2 572 252	
Urban	2 168 601	
Rural	403 651	
Number of municipalities	79	
Population in 2030	2 910 425	inhabitants

Water availability, 2007

Normal annual precipitation 1971-2000	448.1 mm
Per capita availability, 2007	3192 m³/inhabitant/year
Surface runoff	5 074 hm³/year
Aquifer recharge	3 131 hm³/year
Number of aquifers	63
Per capita availability, 2030	2 819 m³/inhabitant/year

Offstream water uses, 2007



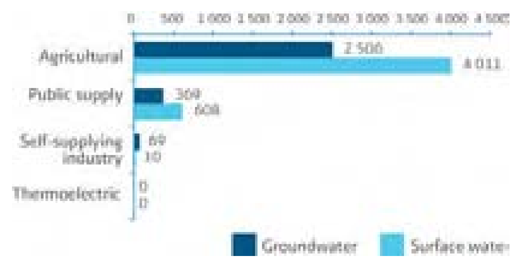
Agricultural	6 517	hm³/year	(86.1%)
Public supply	977	hm³/year	(12.9%)
Self-supplying industry	79	hm³/year	(1.0%)
Thermoelectric	0	hm³/year	(0.0%)
Total	7 573	hm³/year	(100.0%)

Instream water uses, 2007

Hydroelectric (volume declared)	3 351	hm³/year

Origen of the water used, 2007

Surface water	4 629 hm³/year (61.1%)
Groundwater	2 944 hm³/year (38.9%)



Drinking water and sanitation, 2005

Drinking water coverage

Regional	94.8	%
Urban	96.6	%
Rural	85.4	%

Sanitation coverage

Regional	84.1	%
Urban	92.0	%
Rural	43.7	%

Treatment plants (up to December 2007)

Municipal treatment plants

Number in operation	20	
Installed capacity	2.890	m^3/s
Flow treated	1.580	m^3/s

Municipal wastewater

Number in operation	80	
Installed capacity	4.28	m^3/s
Flow treated	3.09	m^3/s

Irrigation Districts, 2007

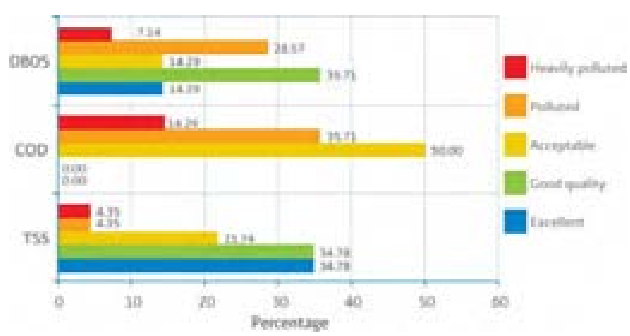
Number of Irrigation Districts	7	
Total surface area of the Irrigation Districts	502 281	hectares

Surface water quality, 2007

Number of water quality monitoring sites

BOD_5	14
COD	14
TSS	23

Percentage distribution of the monitoring sites by indicator and classification scale of water quality



Water bodies with sites classified as strongly polluted by BOD_5, COD and/or TSS: Arroyo El Barrilito.

Hydrological-Administrative Region:	III. Northern Pacific
River Basin Organization based in:	Culiacan, Sinaloa

Contextual information

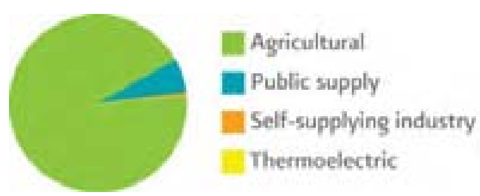
2007 population (inhabitants)

Total	3 959 279	
Urban	2 638 717	
Rural	1 320 562	
Number of municipalities	51	
Population in 2030	3 794 715	inhabitants

Water availability, 2007

Normal annual precipitation 1971-2000	747.7 mm
Per capita availability, 2007	6 471 m³/inhabitant/year
Surface runoff	22 364 hm³/year
Aquifer recharge	3 263 hm³/year
Number of aquifers	24
Per capita availability, 2030	6 762 m³/inhabitant/year

Offstream water uses, 2007



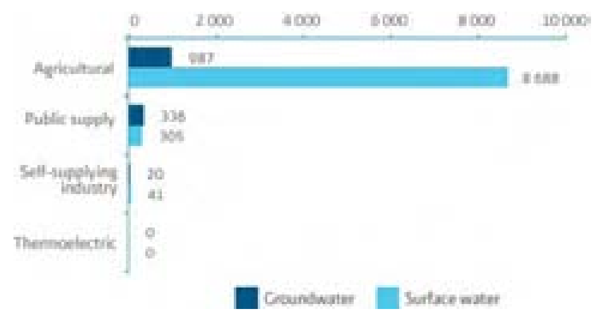
Agricultural	9 674	hm³/year	(93.2%)
Public supply	641	hm³/year	(6.2%)
Self-supplying industry	61	hm³/year	(0.6%)
Thermoelectric	0	hm³/year	(0.0%)
Total	10 376	hm³/year	(100.0%)

Instream water uses, 2007

Hydroelectric (volume declared)	11 184	hm³/year

Origen of the water used, 2007

Surface water	9 034 hm³/year (87.1%)
Groundwater	1 342 hm³/year (12.9%)



Drinking water and sanitation, 2005

Drinking water coverage

Regional	89.0	%
Urban	97.9	%
Rural	71.9	%

Sanitation coverage

Regional	82.6	%
Urban	95.0	%
Rural	58.9	%

Treatment plants (up to December 2007)

Municipal treatment plants

Number in operation	150	
Installed capacity	9.081	m^3/s
Flow treated	7.234	m^3/s

Municipal wastewater

Number in operation	229	
Installed capacity	8.08	m^3/s
Flow treated	6.16	m^3/s

Irrigation Districts, 2007

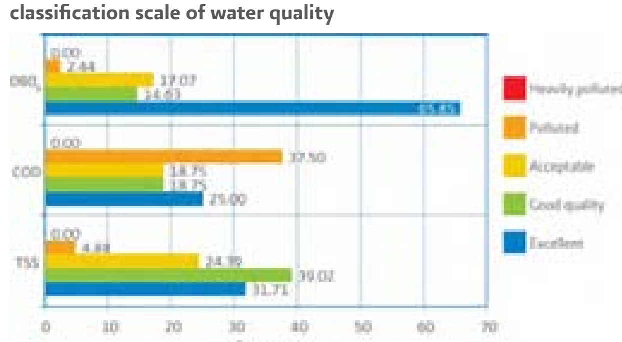
Number of Irrigation Districts	9	
Total surface area of the Irrigation Districts	789 034	hectares

Surface water quality, 2007

Number of water quality monitoring sites

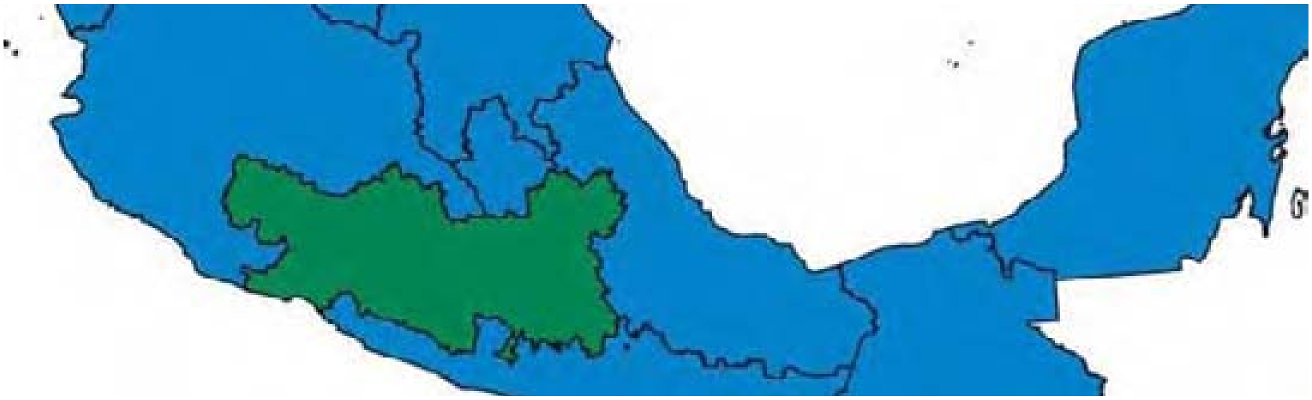
BOD_5	41
COD	16
TSS	41

Percentage distribution of the monitoring sites by indicator and classification scale of water quality



Water bodies with sites classified as strongly polluted by BOD_5, COD and/or TSS: None

Hydrological-Administrative Region:	IV. Balsas
River Basin Organization based in:	Cuernavaca, Morelos

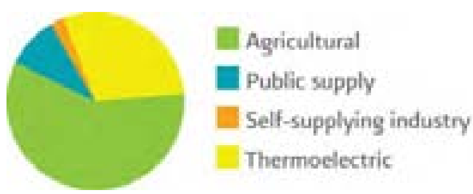


Contextual information

2007 population (inhabitants)

Total	10 535 977	
Urban	7 419 407	
Rural	3 116 571	
Number of municipalities	422	
Population in 2030	11 127 421	inhabitants

Offstream water uses, 2007



Agricultural	6 324	hm^3/year	(58.7%)
Public supply	1 014	hm^3/year	(9.4%)
Self-supplying industry	269	hm^3/year	(2.5%)
Thermoelectric	3 170	hm^3/year	(29.4%)
Total	10 778	hm^3/year	(100.0%)

Instream water uses, 2007

Hydroelectric (volume declared)	31 099	hm^3/year

Drinking water and sanitation, 2005

Drinking water coverage

Regional	84.4	%
Urban	91.2	%
Rural	69.2	%

Sanitation coverage

Regional	81.4	%
Urban	91.7	%
Rural	57.9	%

Treatment plants (up to December 2007)

Municipal treatment plants

Number in operation	21	
Installed capacity	23.182	m^3/s
Flow treated	17.575	m^3/s

Municipal wastewater

Number in operation	138	
Installed capacity	7.24	m^3/s
Flow treated	5.13	m^3/s

Irrigation Districts, 2007

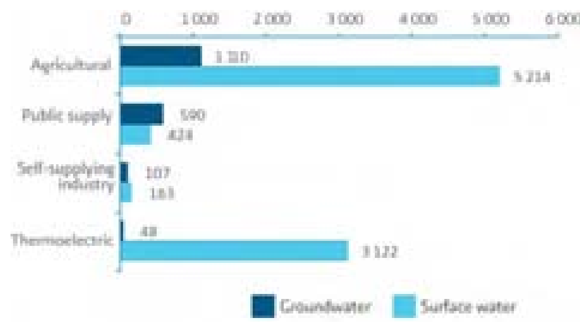
Number of Irrigation Districts	9	
Total surface area of the Irrigation Districts	225 511	hectares

Water availability, 2007

Normal annual precipitation 1971-2000	963.0 mm
Per capita availability, 2007	2 055 m^3/inhabitant/year
Surface runoff	17 057 hm^3/year
Aquifer recharge	4 601 hm^3/year
Number of aquifers	46
Per capita availability, 2030	1 946 m^3/inhabitant/year

Origen of the water used, 2007

Surface water	8 923 hm^3/year (82.8%)
Groundwater	1 855 hm^3/year (17.2%)

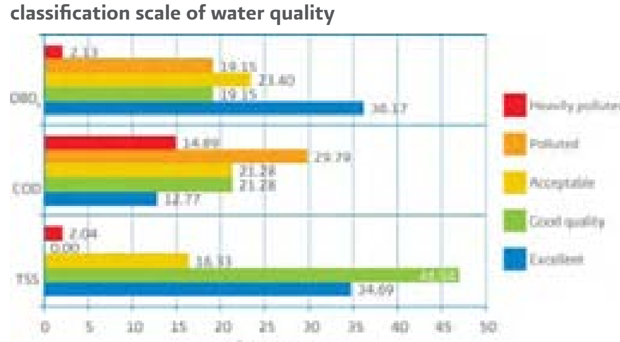


Surface water quality, 2007

Number of water quality monitoring sites

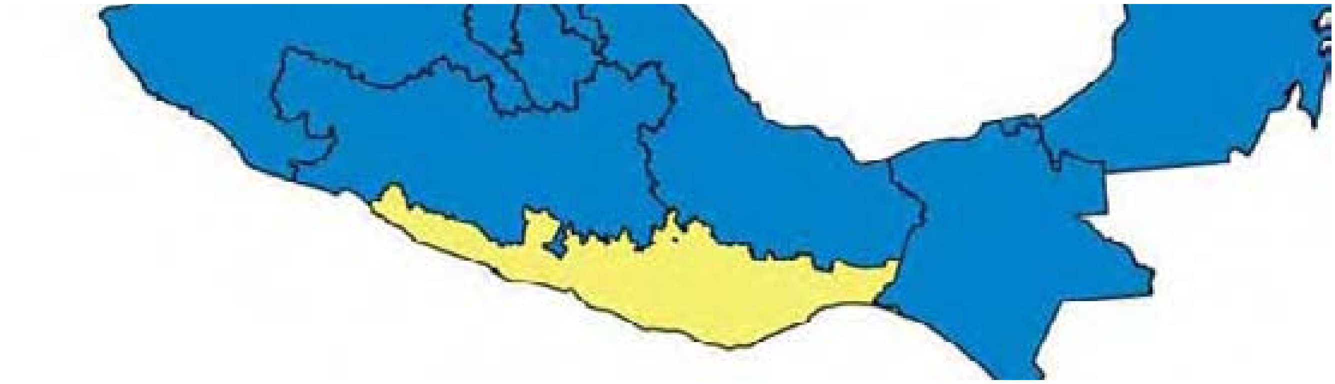
BOD_5	47
COD	47
TSS	49

Percentage distribution of the monitoring sites by indicator and classification scale of water quality



Water bodies with sites classified as strongly polluted by BOD_5, COD and/or TSS: Rivers Atoyac, Alseseca and Cupatizio and the Estuary of the River Balsas.

Hydrological-Administrative Region:	**V. Southern Pacific**
River Basin Organization based in:	**Oaxaca, Oaxaca**



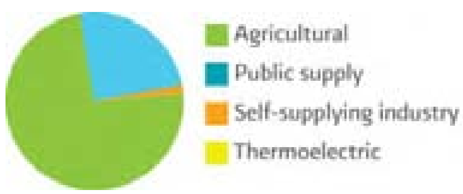
Contextual information

2007 population (inhabitants)		
Total	4 116 080	
Urban	2 412 196	
Rural	1 703 884	
Number of municipalities	362	
Population in 2030	4 014 937	inhabitants

Water availability, 2007

Normal annual precipitation 1971-2000	1184.6 mm
Per capita availability, 2007	7 960 m³/inhabitant/year
Surface runoff	30 800 hm³/year
Aquifer recharge	1 994 hm³/year
Number of aquifers	35
Per capita availability, 2030	8 158 m³/inhabitant/year

Offstream water uses, 2007



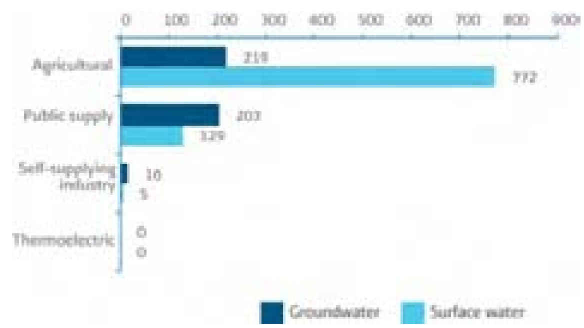
Agricultural	991	hm³/year	(73.7%)
Public supply	332	hm³/year	(24.7%)
Self-supplying industry	21	hm³/year	(1.6%)
Thermoelectric	0	hm³/year	(0.0%)
Total	1 343	hm³/year	(100.0%)

Instream water uses, 2007

Hydroelectric (volume declared)	2 140	hm³/year

Origen of the water used, 2007

Surface water	906 hm³/year (67.4%)
Groundwater	438 hm³/year (32.6%)



Drinking water and sanitation, 2005

Drinking water coverage

Regional	73.5	%
Urban	83.6	%
Rural	59.6	%

Sanitation coverage

Regional	63.3	%
Urban	83.5	%
Rural	35.5	%

Treatment plants (up to December 2007)

Municipal treatment plants

Number in operation	8	
Installed capacity	3.181	m^3/s
Flow treated	2.586	m^3/s

Municipal wastewater

Number in operation	78	
Installed capacity	2.55	m^3/s
Flow treated	1.58	m^3/s

Irrigation Districts, 2007

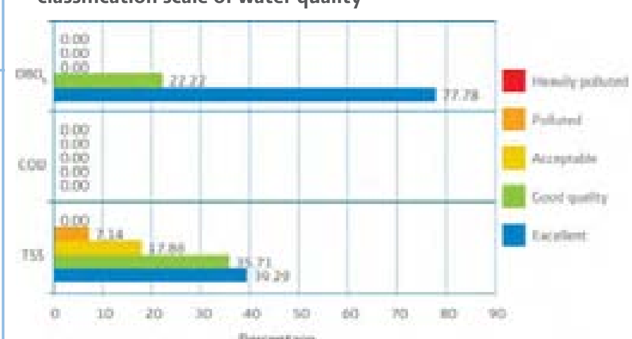
Number of Irrigation Districts	5	
Total surface area of the Irrigation Districts	75 389	hectares

Surface water quality, 2007

Number of water quality monitoring sites

BOD_5	9
COD	0
TSS	28

Percentage distribution of the monitoring sites by indicator and classification scale of water quality



Water bodies with sites classified as strongly polluted by BOD_5, COD and/or TSS: None

Hydrological-Administrative Region:	VI. Rio Bravo
River Basin Organization based in:	Monterrey, Nuevo Leon

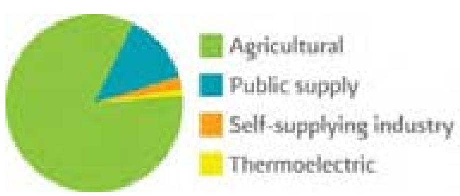
Contextual information

2007 population (inhabitants)		
Total	10 703 815	
Urban	10 015 532	
Rural	688 283	
Number of municipalities	141	
Population in 2030	13 251 755	inhabitants

Water availability, 2007

Normal annual precipitation 1971-2000	435.9 mm
Per capita availability, 2007	1 124 m³/inhabitant/year
Surface runoff	6 857 hm³/year
Aquifer recharge	5 167 hm³/year
Number of aquifers	100
Per capita availability, 2030	907 m³/inhabitant/year

Offstream water uses, 2007



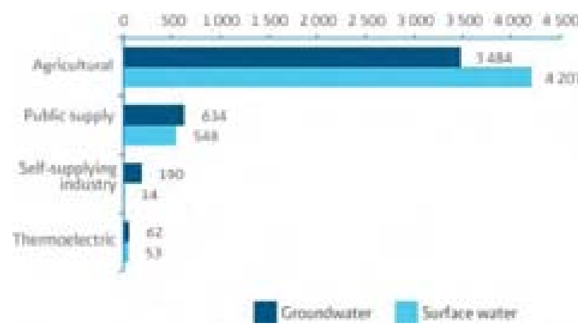
Agricultural	7 690	hm³/year	(83.7%)
Public supply	1 182	hm³/year	(12.9%)
Self-supplying industry	203	hm³/year	(2.2%)
Thermoelectric	115	hm³/year	(1.3%)
Total	9 191	hm³/year	(100.0%)

Instream water uses, 2007

Hydroelectric (volume declared)	2 890	hm³/year

Origen of the water used, 2007

Surface water	4 822 hm³/year (52.5%)
Groundwater	4 370 hm³/year (47.5%)



Drinking water and sanitation, 2005

Drinking water coverage

Regional	96.1	%
Urban	97.9	%
Rural	71.6	%

Sanitation coverage

Regional	93.8	%
Urban	95.8	%
Rural	65.0	%

Treatment plants (up to December 2007)

Municipal treatment plants

Number in operation	58	
Installed capacity	25.964	m^3/s
Flow treated	15.819	m^3/s

Municipal wastewater

Number in operation	181	
Installed capacity	25.53	m^3/s
Flow treated	21.78	m^3/s

Irrigation Districts, 2007

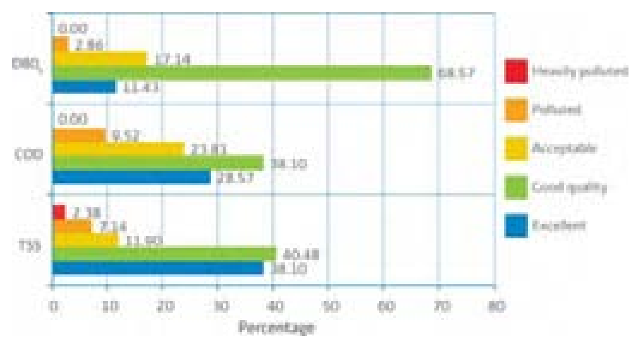
Number of Irrigation Districts	12	
Total surface area of the Irrigation Districts	554 597	hectares

Surface water quality, 2007

Number of water quality monitoring sites

BOD_5	35
COD	42
TSS	42

Percentage distribution of the monitoring sites by indicator and classification scale of water quality



Water bodies with sites classified as strongly polluted by BOD_5, COD and/or TSS: River Salado.

Hydrological-Administrative Region:	VII. Central Basins of the North
River Basin Organization based in:	Torreon, Coahuila de Zaragoza

Contextual information

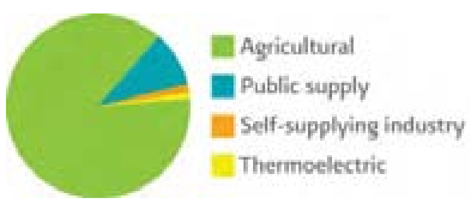
2007 population (inhabitants)

Total	4 120 949	
Urban	3 000 895	
Rural	1 120 055	
Number of municipalities	83	
Population in 2030	4 568 007	inhabitants

Water availability, 2007

Normal annual precipitation 1971-2000	427.6 mm
Per capita availability, 2007	1 888 m³/inhabitant/year
Surface runoff	5 506 hm³/year
Aquifer recharge	2 274 hm³/year
Number of aquifers	68
Per capita availability, 2030	1 702 m³/inhabitant/year

Offstream water uses, 2007



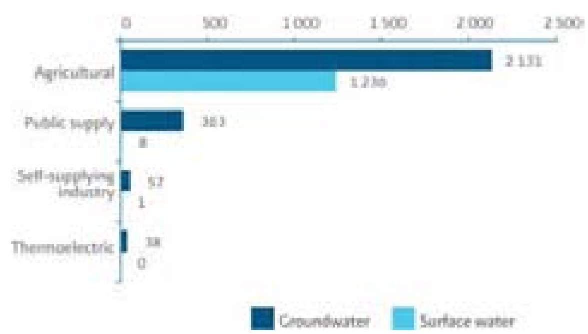
Agricultural	3 368	hm³/year	(87.8%)
Public supply	370	hm³/year	(9.7%)
Self-supplying industry	58	hm³/year	(1.5%)
Thermoelectric	38	hm³/year	(1.0%)
Total	3 834	hm³/year	(100.0%)

Instream water uses, 2007

Hydroelectric (volume declared)	0	hm³/year

Origen of the water used, 2007

Surface water	1 245 hm³/year (32.5%)
Groundwater	2 589 hm³/year (67.5%)



Drinking water and sanitation, 2005

Drinking water coverage

Regional	93.3	%
Urban	98.8	%
Rural	79.1	%

Sanitation coverage

Regional	85.6	%
Urban	95.6	%
Rural	59.9	%

Treatment plants (up to December 2007)

Municipal treatment plants

Number in operation	48	
Installed capacity	0.365	m^3/s
Flow treated	0.251	m^3/s

Municipal wastewater

Number in operation	106	
Installed capacity	5.15	m^3/s
Flow treated	4.01	m^3/s

Irrigation Districts, 2007

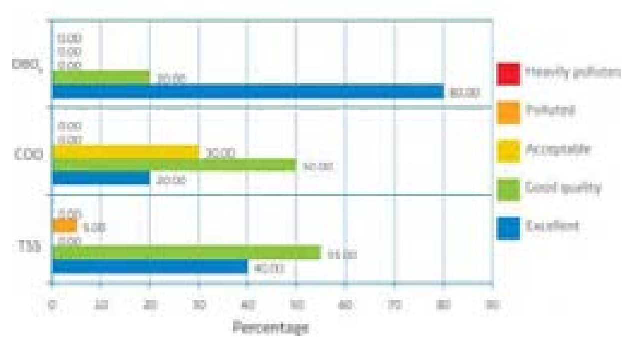
Number of Irrigation Districts	1	
Total surface area of the Irrigation Districts	116 577	hectares

Surface water quality, 2007

Number of water quality monitoring sites

BOD_5	20
COD	20
TSS	20

Percentage distribution of the monitoring sites by indicator and classification scale of water quality.



Water bodies with sites classified as strongly polluted by BOD_5, COD and/or TSS: None

Hydrological-Administrative Region:	VIII. Lerma-Santiago-Pacífico
River Basin Organization based in:	Guadalajara, Jalisco

Contextual information

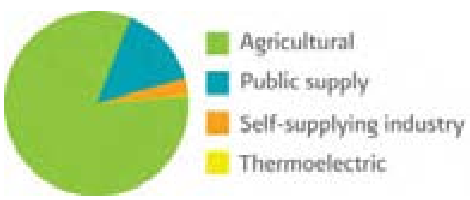
2007 population (inhabitants)

Total	20 625 203	
Urban	16 080 111	
Rural	4 545 092	
Number of municipalities	329	
Population in 2030	23 511 810	inhabitants

Water availability, 2007

Normal annual precipitation 1971-2000	817.9	mm
Per capita availability, 2007	1 650	m³/inhabitant/year
Surface runoff	26 351	hm³/year
Aquifer recharge	7 686	hm³/year
Number of aquifers	127	
Per capita availability, 2030	1 448	m³/inhabitant/year

Offstream water uses, 2007



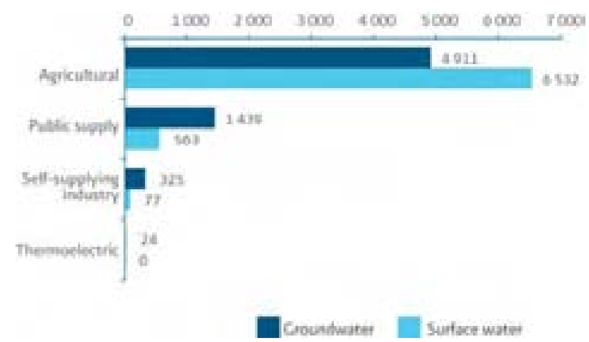
Agricultural	11 444	hm³/year	(82.5%)
Public supply	2 002	hm³/year	(14.4%)
Self-supplying industry	402	hm³/year	(2.9%)
Thermoelectric	24	hm³/year	(0.2%)
Total	13 873	hm³/year	(100.0%)

Instream water uses, 2007

Hydroelectric (volume declared)	10 517	hm³/year

Origen of the water used, 2007

Surface water	7 173 hm³/year (51.7%)
Groundwater	6 700 hm³/year (48.3%)



Drinking water and sanitation, 2005

Drinking water coverage

Regional	93.4	%
Urban	96.1	%
Rural	84.3	%

Sanitation coverage

Regional	90.1	%
Urban	96.2	%
Rural	69.3	%

Treatment plants (up to December 2007)

Municipal treatment plants

Number in operation	73	
Installed capacity	19.373	m³/s
Flow treated	12.112	m³/s

Municipal wastewater

Number in operation	421	
Installed capacity	22.55	m³/s
Flow treated	17.27	m³/s

Irrigation Districts, 2007

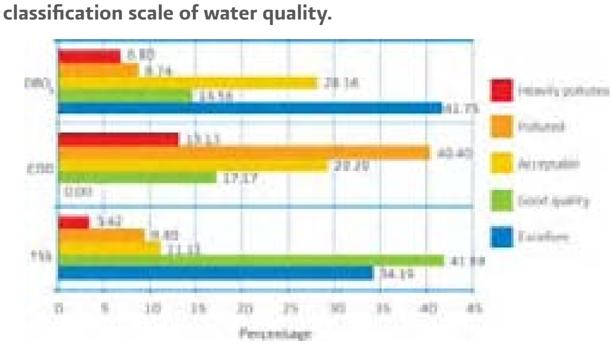
Number of Irrigation Districts	14	
Total surface area of the Irrigation Districts	499 237	hectares

Surface water quality, 2007

Number of water quality monitoring sites

BOD_5	103
COD	99
TSS	117

Percentage distribution of the monitoring sites by indicator and classification scale of water quality.



Water bodies with sites classified as strongly polluted by BOD_5, COD and/or TSS: Rivers Coahuayana, Tamazula, Salado, Ixtlan, Turbio, Lerma, Armeria, Ayuquila, La Laja and Santiago, Mezapa and Laguna de Almoloya del Rio Streams.

Hydrological-Administrative Region:	IX. Northern Gulf
River Basin Organization based in:	Ciudad Victoria, Tamaulipas

Contextual information

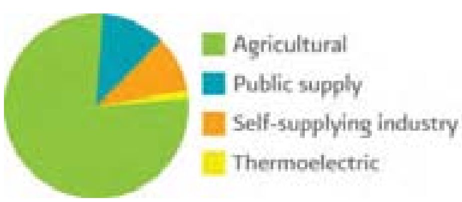
2007 population (inhabitants)

Total	4 941 244	
Urban	2 493 307	
Rural	2 447 937	
Number of municipalities	154	
Population in 2030	5 099 143	inhabitants

Water availability, 2007

Normal annual precipitation 1971-2000	910.9 mm
Per capita availability, 2007	5 162 m³/inhabitant/year
Surface runoff	24 227 hm³/year
Aquifer recharge	1 274 hm³/year
Number of aquifers	40
Per capita availability, 2030	5 000 m³/inhabitant/year

Offstream water uses, 2007



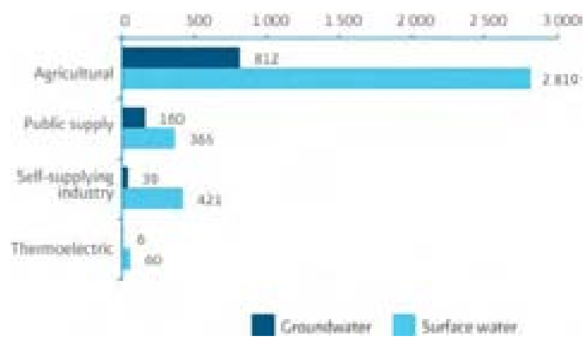
Agricultural	3 631	hm³/year	(77.6%)
Public supply	525	hm³/year	(11.2%)
Self-supplying industry	461	hm³/year	(9.8%)
Thermoelectric	66	hm³/year	(1.4%)
Total	4 681	hm³/year	(100.0%)

Instream water uses, 2007

Hydroelectric (volume declared)	1 105	hm³/year

Origen of the water used, 2007

Surface water	3 665 hm³/year (78.3%)
Groundwater	1 017 hm³/year (21.7%)



Drinking water and sanitation, 2005

Drinking water coverage

Regional	80.9	%
Urban	96.6	%
Rural	65.3	%

Sanitation coverage

Regional	65.3	%
Urban	88.2	%
Rural	42.5	%

Treatment plants (up to December 2007)

Municipal treatment plants

Number in operation	40	
Installed capacity	6.592	m^3/s
Flow treated	5.829	m^3/s

Municipal wastewater

Number in operation	84	
Installed capacity	2.25	m^3/s
Flow treated	1.95	m^3/s

Irrigation Districts, 2007

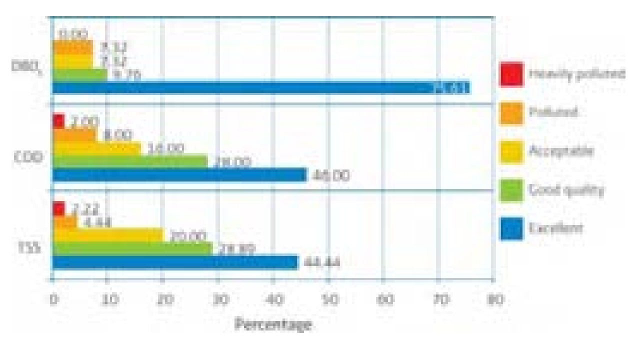
Number of Irrigation Districts	13	
Total surface area of the Irrigation Districts	265 594	hectares

Surface water quality, 2007

Number of water quality monitoring sites

BOD_5	41
COD	50
TSS	45

Percentage distribution of the monitoring sites by indicator and classification scale of water quality



Water bodies with sites classified as strongly polluted by BOD_5, COD and/or TSS: Rivers San Juan del Rio and Soto La Marina.

Hydrological-Administrative Region:	X. Central Gulf
River Basin Organization based in:	Xalapa, Veracruz

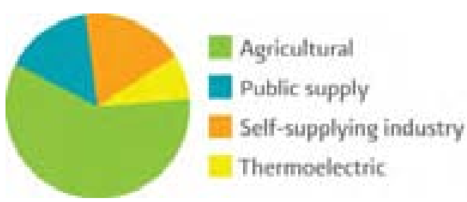
Contextual information

2007 population (inhabitants)		
Total	9 583 822	
Urban	5 480 425	
Rural	4 103 397	
Number of municipalities	445	
Population in 2030	9 925 044	inhabitants

Water availability, 2007

Normal annual precipitation 1971-2000	1552.8 mm
Per capita availability, 2007	9 964 m³/inhabitant/year
Surface runoff	91 606 hm³/year
Aquifer recharge	3 849 hm³/year
Number of aquifers	22
Per capita availability, 2030	9 613 m³/inhabitant/year

Offstream water uses, 2007



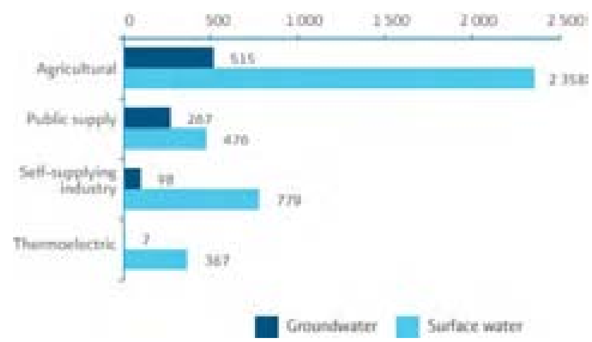
Agricultural	2 873	hm³/year	(59.0%)
Public supply	743	hm³/year	(15.3%)
Self-supplying industry	877	hm³/year	(18.0%)
Thermoelectric	374	hm³/year	(7.7%)
Total	4 867	hm³/year	(100.0%)

Instream water uses, 2007

Hydroelectric (volume declared)	14 279	hm³/year

Origen of the water used, 2007

Surface water	3 980 hm³/year (81.8%)
Groundwater	888 hm³/year (18.2%)



Drinking water and sanitation, 2005

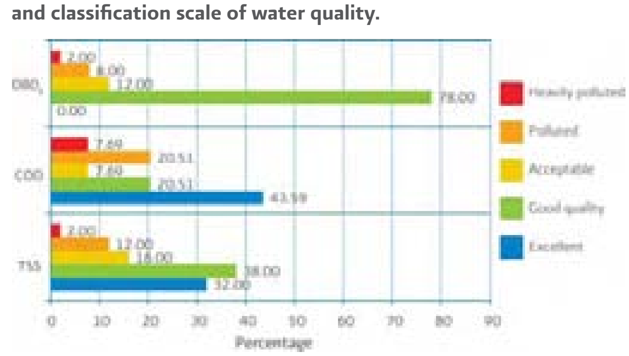
Drinking water coverage		
Regional	77.2	%
Urban	89.7	%
Rural	61.2	%
Sanitation coverage		
Regional	74.8	%
Urban	92.1	%
Rural	52.7	%

Surface water quality, 2007

Number of water quality monitoring sites

BOD_5	50
COD	39
TSS	50

Percentage distribution of the monitoring sites by indicator and classification scale of water quality.



Water bodies with sites classified as strongly polluted by BOD_5, COD and/or TSS: El Diamante and Teapa Streams and Rivers Blanco and Orizaba.

Treatment plants (up to December 2007)

Municipal treatment plants		
Number in operation	7	
Installed capacity	6.400	m^3/s
Flow treated	4.575	m^3/s
Municipal wastewater		
Number in operation	122	
Installed capacity	4.67	m^3/s
Flow treated	2.64	m^3/s

Irrigation Districts, 2007

Number of Irrigation Districts	2	
Total surface area of the Irrigation Districts	43 508	hectares

Hydrological-Administrative Region: XI. Southern Border
River Basin Organization based in: Tuxtla Gutierrez, Chiapas

Contextual information

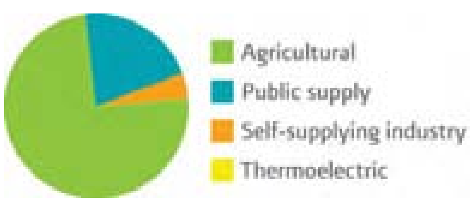
2007 population (inhabitants)

Total	6 502 913	
Urban	3 286 140	
Rural	3 216 773	
Number of municipalities	139	
Population in 2030	7 504 259	inhabitants

Water availability, 2007

Normal annual precipitation 1971-2000	1 845.6	mm
Per capita availability, 2007	24 270	m³/inhabitant/year
Surface runoff	139 739	hm³/year
Aquifer recharge	18 015	hm³/year
Number of aquifers	23	
Per capita availability, 2030	21 034	m³/inhabitant/year

Offstream water uses, 2007



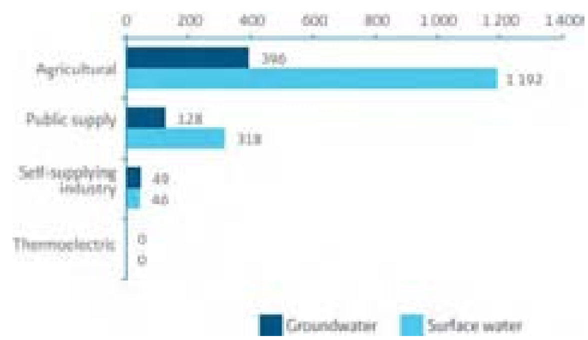
Agricultural	1 588	hm³/year	(74.6%)
Public supply	446	hm³/year	(21.0%)
Self-supplying industry	95	hm³/year	(4.4%)
Thermoelectric	0	hm³/year	(0.0%)
Total	2 129	hm³/year	(100.0%)

Instream water uses, 2007

Hydroelectric (volume declared) 46 257 hm³/year

Origen of the water used, 2007

Surface water	1 556 hm³/year (73.1%)
Groundwater	572 hm³/year (29.6%)



Drinking water and sanitation, 2005

Drinking water coverage

Regional	74.4	%
Urban	87.0	%
Rural	61.8	%

Sanitation coverage

Regional	80.7	%
Urban	95.4	%
Rural	66.1	%

Treatment plants (up to December 2007)

Municipal treatment plants

Number in operation	40	
Installed capacity	13.171	m³/s
Flow treated	8.224	m³/s

Municipal wastewater

Number in operation	95	
Installed capacity	3.33	m³/s
Flow treated	2.50	m³/s

Irrigation Districts, 2007

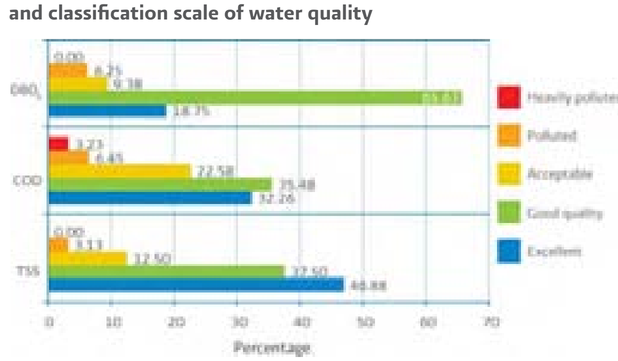
Number of Irrigation Districts	4	
Total surface area of the Irrigation Districts	36 399	hectares

Surface water quality, 2007

Number of water quality monitoring sites

BOD_5	32
COD	31
TSS	32

Percentage distribution of the monitoring sites by indicator and classification scale of water quality



Water bodies with sites classified as strongly polluted by BOD_5, COD and/or TSS: Rivers San Juan del Rio and Soto La Marina.

Hydrological-Administrative Region:	**XII. Yucatan Peninsula**
River Basin Organization based in:	**Merida, Yucatan**

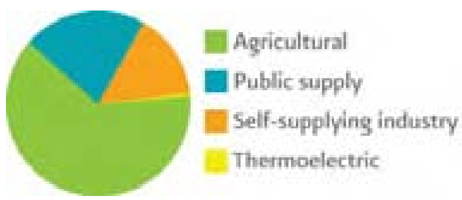
Contextual information

2007 population (inhabitants)		
Total	3 903 937	
Urban	3 219 129	
Rural	684 808	
Number of municipalities	124	
Population in 2030	5 807 391	inhabitants

Water availability, 2007

Normal annual precipitation 1971-2000	1219.2 mm
Per capita availability, 2007	7 601 m³/inhabitant/year
Surface runoff	4 329 hm³/year
Aquifer recharge	25 316 hm³/year
Number of aquifers	4
Per capita availability, 2030	5 102 m³/inhabitant/year

Offstream water uses, 2007



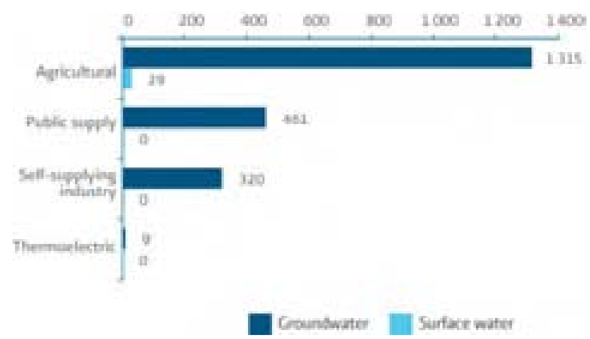
Agricultural	1 343	hm³/year	(63.0%)
Public supply	461	hm³/year	(21.6%)
Self-supplying industry	320	hm³/year	(15.0%)
Thermoelectric	9	hm³/year	(0.4%)
Total	2 134	hm³/year	(100.0%)

Instream water uses, 2007

Hydroelectric (volume declared)	0	hm³/year

Origen of the water used, 2007

Surface water	29 hm³/year (1.4%)
Groundwater	2 105 hm³/year (98.6%)



Drinking water and sanitation, 2005

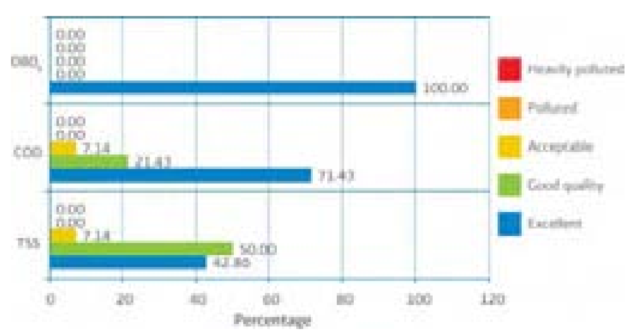
Drinking water coverage		
Regional	94.1	%
Urban	95.4	%
Rural	88.5	%
Sanitation coverage		
Regional	76.3	%
Urban	83.8	%
Rural	43.7	%

Surface water quality, 2007

Number of water quality monitoring sites

BOD_5	7
COD	14
TSS	14

Percentage distribution of the monitoring sites by indicator and classification scale of water quality



Treatment plants (up to December 2007)

Municipal treatment plants		
Number in operation	1	
Installed capacity	0.005	m^3/s
Flow treated	0.005	m^3/s
Municipal wastewater		
Number in operation	52	
Installed capacity	2.24	m^3/s
Flow treated	1.72	m^3/s

Irrigation Districts, 2007

Number of Irrigation Districts	2	
Total surface area of the Irrigation Districts	36 871	hectares

Water bodies with sites classified as strongly polluted by BOD_5, COD and/or TSS: None

Hydrological-Administrative Region:	XIII. Waters of the Valley of Mexico
River Basin Organization based in:	Mexico, Distrito Federal

Contextual information

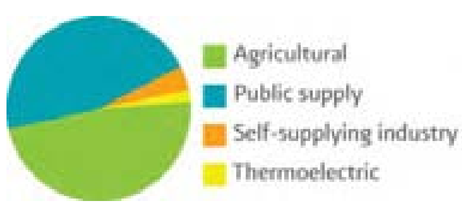
2007 population (inhabitants)

Total	21 090 206	
Urban	20 227 392	
Rural	862 815	
Number of municipalities	116	
Population in 2030	23 673 230	inhabitants

Water availability, 2007

Normal annual precipitation 1971-2000	610.2 mm
Per capita availability, 2007	143 m³/inhabitant/year
Surface runoff	1 174 hm³/year
Aquifer recharge	1 834 hm³/year
Number of aquifers	14
Per capita availability, 2030	127 m³/inhabitant/year

Offstream water uses, 2007



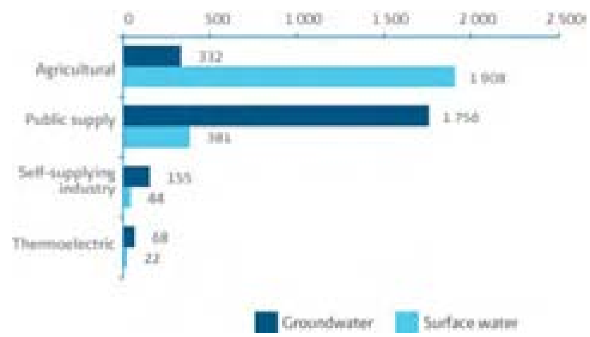
Agricultural	2 240	hm³/year	(48.0%)
Public supply	2 138	hm³/year	(45.8%)
Self-supplying industry	199	hm³/year	(4.3%)
Thermoelectric	90	hm³/year	(1.9%)
Total	4 665	hm³/year	(100.0%)

Instream water uses, 2007

Hydroelectric (volume declared) 11 hm³/year

Origen of the water used, 2007

Surface water	2 355 hm³/year (50.5%)
Groundwater	2 311 hm³/year (49.5%)



Drinking water and sanitation, 2005

Drinking water coverage

Regional	96.5	%
Urban	97.0	%
Rural	85.4	%

Sanitation coverage

Regional	97.2	%
Urban	98.1	%
Rural	78.0	%

Treatment plants (up to December 2007)

Municipal treatment plants

Number in operation	37	
Installed capacity	5.117	m^3/s
Flow treated	4.226	m^3/s

Municipal wastewater

Number in operation	83	
Installed capacity	10.70	m^3/s
Flow treated	5.70	m^3/s

Irrigation Districts, 2007

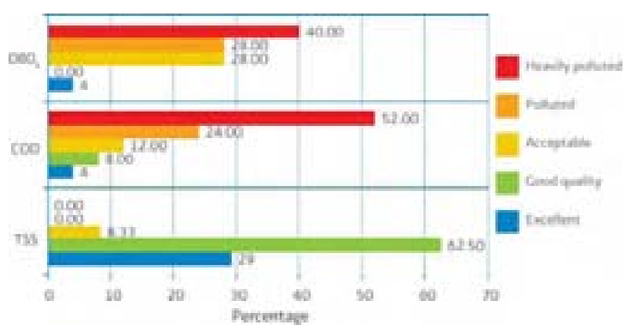
Number of Irrigation Districts	5	
Total surface area of the Irrigation Districts	104 998	hectares

Surface water quality, 2007

Number of water quality monitoring sites

BOD_5	25
COD	25
TSS	24

Percentage distribution of the monitoring sites by indicator and classification scale of water quality.



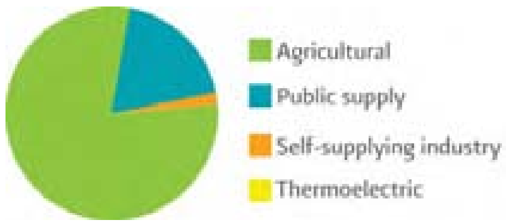
Water bodies with sites classified as strongly polluted by BOD_5, COD and/or TSS: Rivers Churubusco, de los Remedios, San Juan Tetihuacan, de la Compañia, San Buenaventura and Juandho Weir.

Annex B: Relevant data by State

1. Aguascalientes

GENERAL DATA		
2007 population (inhabitants)		
Total	1 115 304	
Urban	906 333	
Rural	208 971	
Number of municipalities	11	
Population in 2030	1 460 232	inhabitants
Normal annual precipitation 1971-2000	512.5	mm

Offstream water uses, 2007



Agricultural	495	hm³/year	(79.2%)
Public supply	119	hm³/year	(19.0%)
Self-supplying industry	11	hm³/year	(1.8%)
Thermoelectric	0	hm³/year	(0.0%)
Total	625	hm³/year	(100.0%)

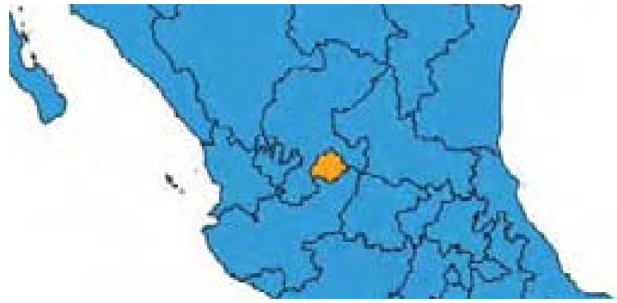
Drinking water and sanitation, 2005

Drinking water coverage		
State-wide	97.8	%
Urban	99.2	%
Rural	92.0	%
Sanitation coverage		
State-wide	96.9	%
Urban	98.8	%
Rural	88.4	%

Treatment plants (up to December 2007)

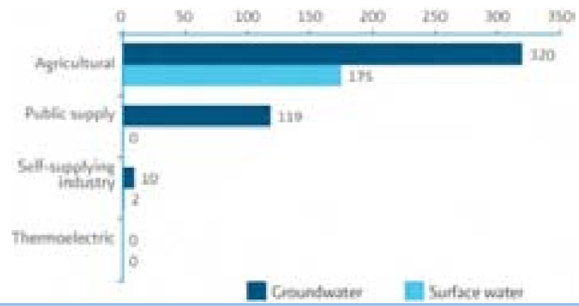
Municipal treatment plants		
Number in operation	2	
Installed capacity	0.038	m^3/s
Flow treated	0.020	m^3/s
Municipal wastewater		
Number in operation	108	
Installed capacity	3.91	m^3/s
Flow treated	3.03	m^3/s
Industrial wastewater		
Number in operation	46	
Installed capacity	0.23	m^3/s
Flow treated	0.11	m^3/s

Location in Mexico



Origen of the water used, 2007

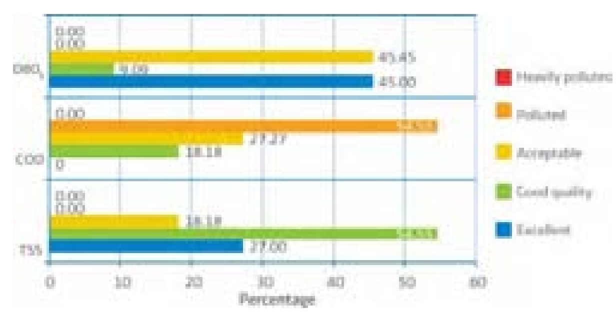
Surface water	177 hm³/year (28.3%)
Groundwater	448 hm³/year (71.7%)



Surface water quality, 2007

Number of water quality monitoring sites	
BOD_5	11
COD	11
TSS	11

Percentage distribution of the monitoring sites by indicator and classification scale of water quality



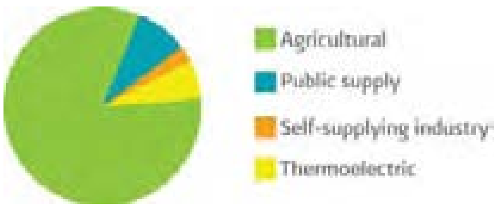
2. Baja California

GENERAL DATA

2007 population (inhabitants)

Total	3 036 393	
Urban	2 829 817	
Rural	206 576	
Number of municipalities	5	
Population in 2030	5 082 349	inhabitants
Normal annual precipitation 1971-2000	175.7	mm

Offstream water uses, 2007



Agricultural	2 564	hm³/year	(82.6%)
Public supply	266	hm³/year	(8.6%)
Self-supplying industry	80	hm³/year	(2.6%)
Thermoelectric	195	hm³/year	(6.3%)
Total	3 105	hm³/year	(100.0%)

Drinking water and sanitation, 2005

Drinking water coverage		
State-wide	93.8	%
Urban	95.9	%
Rural	67.5	%
Sanitation coverage		
State-wide	88.9	%
Urban	91.8	%
Rural	51.7	%

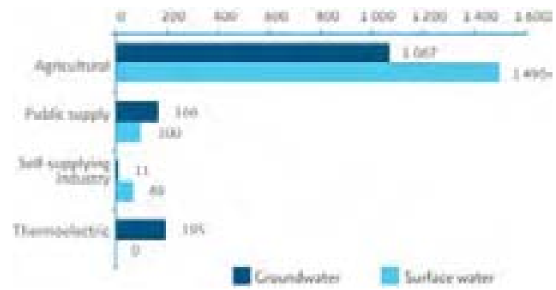
Treatment plants (up to December 2007)

Municipal treatment plants		
Number in operation	26	
Installed capacity	10.699	m^3/s
Flow treated	6.016	m^3/s
Municipal wastewater		
Number in operation	25	
Installed capacity	6.52	m^3/s
Flow treated	4.93	m^3/s
Industrial wastewater		
Number in operation	174	
Installed capacity	0.44	m^3/s
Flow treated	0.15	m^3/s

Location in Mexico

Origen of the water used, 2007

Surface water	1 665 hm³/year (53.6%)
Groundwater	1 439 hm³/year (46.4%)

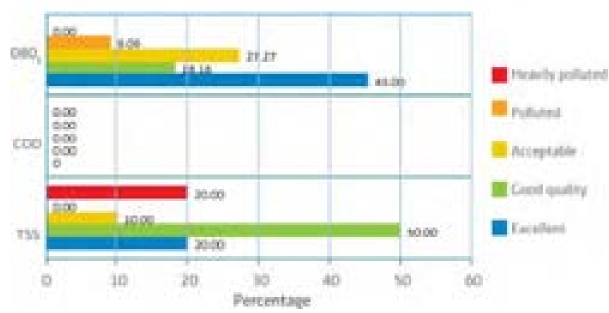


Surface water quality, 2007

Number of water quality monitoring sites

BOD_5	11
COD	
TSS	10

Percentage distribution of the monitoring sites by indicator and classification scale of water quality



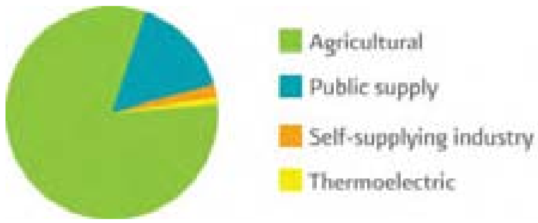
3. Baja California Sur

GENERAL DATA

2007 population (inhabitants)		
Total	544 556	
Urban	462 267	
Rural	82 289	
Number of municipalities	5	
Population in 2030	833 044	inhabitants
Normal annual precipitation 1971-2000	161.0	mm

Location in Mexico

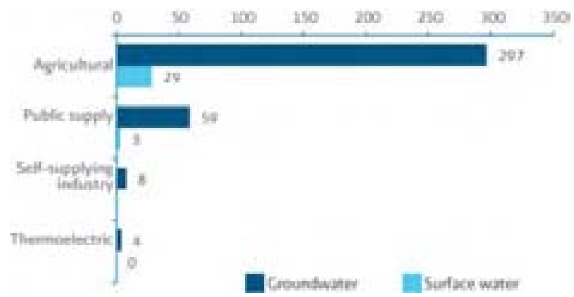
Offstream water uses, 2007



Agricultural	326	hm^3/year	(81.6%)
Public supply	61	hm^3/year	(15.4%)
Self-supplying industry	8	hm^3/year	(2.1%)
Thermoelectric	4	hm^3/year	(1.0%)
Total	399	hm^3/year	(100.0%)

Origen of the water used, 2007

Surface water	32 hm^3/year (8.0%)
Groundwater	367 hm^3/year (92.0%)



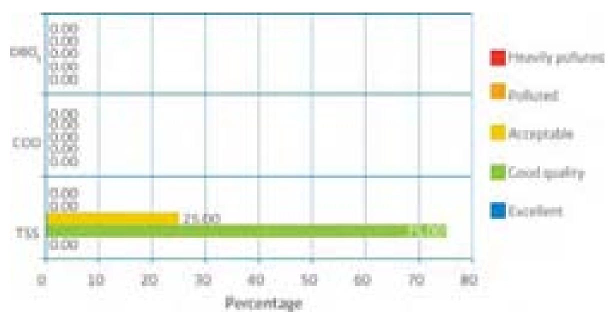
Drinking water and sanitation, 2005

Drinking water coverage		
State-wide	87.7	%
Urban	89.9	%
Rural	75.3	%
Sanitation coverage		
State-wide	89.7	%
Urban	94.3	%
Rural	64.6	%

Surface water quality, 2007

Number of water quality monitoring sites	
BOD_5	
COD	
TSS	4

Percentage distribution of the monitoring sites by indicator and classification scale of water quality



Treatment plants (up to December 2007)

Municipal treatment plants		
Number in operation	12	
Installed capacity	0.473	m^3/s
Flow treated	0.363	m^3/s
Municipal wastewater		
Number in operation	16	
Installed capacity	1.20	m^3/s
Flow treated	0.84	m^3/s
Industrial wastewater		
Number in operation	7	
Installed capacity	0.01	m^3/s
Flow treated	0.01	m^3/s

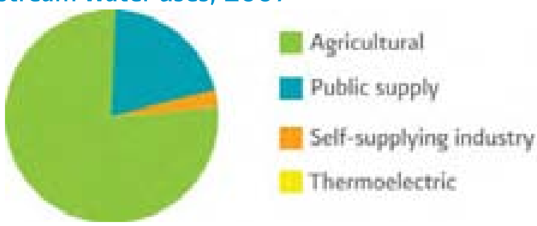
4. Campeche

GENERAL DATA

2007 population (inhabitants)

Total	782 130	
Urban	581 030	
Rural	201 100	
Number of municipalities	11	
Population in 2030	968 665	inhabitants
Normal annual precipitation 1971-2000	1336.8	mm

Offstream water uses, 2007



Agricultural	477	hm³/year	(77.0%)
Public supply	125	hm³/year	(20.3%)
Self-supplying industry	17	hm³/year	(2.7%)
Thermoelectric	0	hm³/year	(0.0%)
Total	619	hm³/year	(100.0%)

Drinking water and sanitation, 2005

Drinking water coverage		
State-wide	88.4	%
Urban	90.9	%
Rural	81.1	%
Sanitation coverage		
State-wide	78.4	%
Urban	89.1	%
Rural	48.1	%

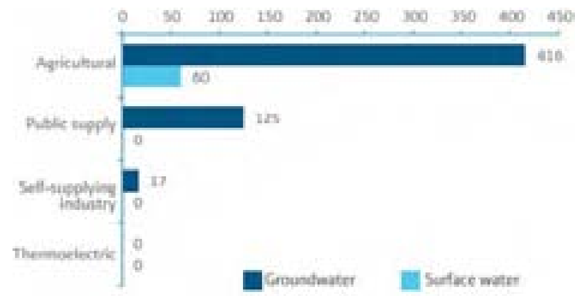
Treatment plants (up to December 2007)

Municipal treatment plants		
Number in operation	2	
Installed capacity	0.025	m^3/s
Flow treated	0.023	m^3/s
Municipal wastewater		
Number in operation	10	
Installed capacity	0.08	m^3/s
Flow treated	0.05	m^3/s
Industrial wastewater		
Number in operation	49	
Installed capacity	0.50	m^3/s
Flow treated	0.16	m^3/s

Location in Mexico

Origen of the water used, 2007

Surface water	61 hm³/year (9.8%)
Groundwater	558 hm³/year (90.2%)

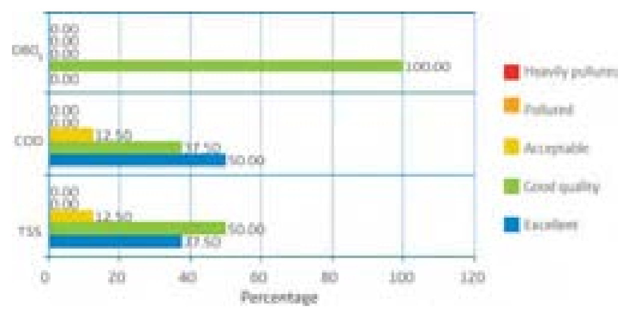


Surface water quality, 2007

Number of water quality monitoring sites

BOD_5	1
COD	8
TSS	8

Percentage distribution of the monitoring sites by indicator and classification scale of water quality



5. Coahuila de Zaragoza

GENERAL DATA

2007 population (inhabitants)		
Total	2 587 917	
Urban	2 332 914	
Rural	255 003	
Number of municipalities	38	
Population in 2030	3 059 206	inhabitants
Normal annual precipitation 1971-2000	379.0	mm

Offstream water uses, 2007

Agricultural	1 606	hm³/year	(82.8%)
Public supply	185	hm³/year	(9.6%)
Self-supplying industry	73	hm³/year	(3.8%)
Thermoelectric	75	hm³/year	(3.9%)
Total	1 940	hm³/year	(100.0%)

Drinking water and sanitation, 2005

Drinking water coverage		
State-wide	97.3	%
Urban	98.7	%
Rural	84.8	%
Sanitation coverage		
State-wide	91.5	%
Urban	94.7	%
Rural	62.7	%

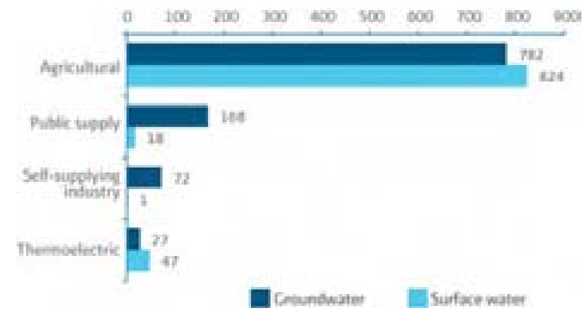
Treatment plants (up to December 2007)

Municipal treatment plants		
Number in operation	18	
Installed capacity	2.132	m^3/s
Flow treated	1.707	m^3/s
Municipal wastewater		
Number in operation	20	
Installed capacity	3.77	m^3/s
Flow treated	2.97	m^3/s
Industrial wastewater		
Number in operation	70	
Installed capacity	0.95	m^3/s
Flow treated	0.64	m^3/s

Location in Mexico

Origen of the water used, 2007

Surface water	890 hm³/year (45.9%)
Groundwater	1 050 hm³/year (54.1%)

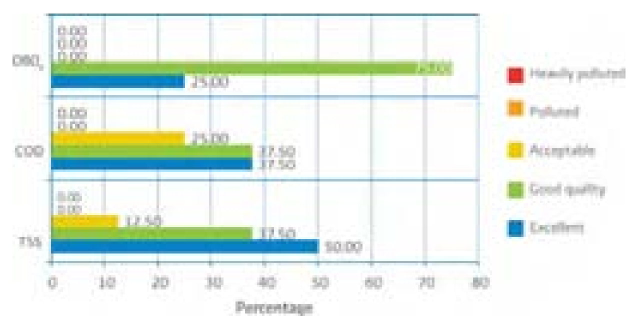


Surface water quality, 2007

Number of water quality monitoring sites

BOD_5	8
COD	8
TSS	8

Percentage distribution of the monitoring sites by indicator and classification scale of water quality



6. Colima

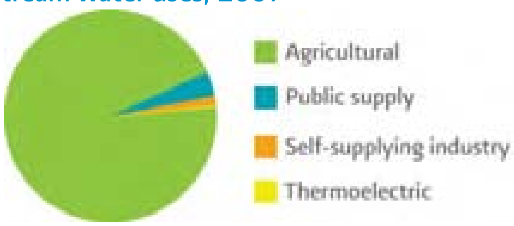
GENERAL DATA

2007 population (inhabitants)

Total	589 327	
Urban	517 524	
Rural	71 803	
Number of municipalities	10	
Population in 2030	734 269	inhabitants
Normal annual precipitation 1971-2000	946.4	mm

Location in Mexico

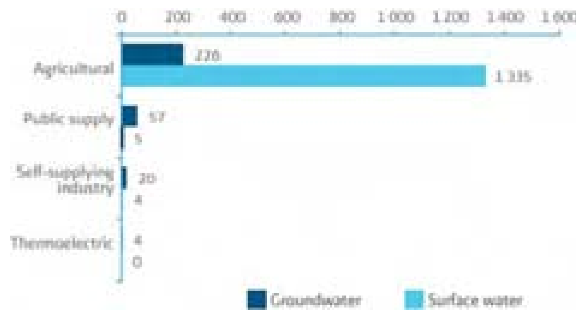
Offstream water uses, 2007



Agricultural	1 561	hm³/year	(94.6%)
Public supply	62	hm³/year	(3.7%)
Self-supplying industry	24	hm³/year	(1.5%)
Thermoelectric	4	hm³/year	(0.2%)
Total	1 651	hm³/year	(100.0%)

Origen of the water used, 2007

Surface water	1 344 hm³/year (81.4%)
Groundwater	307 hm³/year (18.6%)



Drinking water and sanitation, 2005

Drinking water coverage

State-wide	97.8	%
Urban	99.1	%
Rural	88.7	%

Sanitation coverage

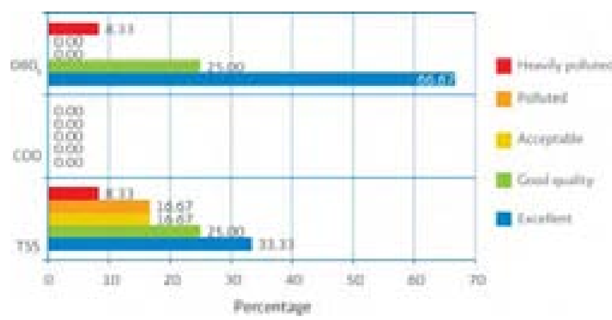
State-wide	98.2	%
Urban	98.8	%
Rural	94.2	%

Surface water quality, 2007

Number of water quality monitoring sites

BOD_5	12
COD	
TSS	12

Percentage distribution of the monitoring sites by indicator and classification scale of water quality



Treatment plants (up to December 2007)

Municipal treatment plants

Number in operation	25	
Installed capacity	0.009	m^3/s
Flow treated	0.005	m^3/s

Municipal wastewater

Number in operation	50	
Installed capacity	1.44	m^3/s
Flow treated	0.95	m^3/s

Industrial wastewater

Number in operation	8	
Installed capacity	0.44	m^3/s
Flow treated	0.31	m^3/s

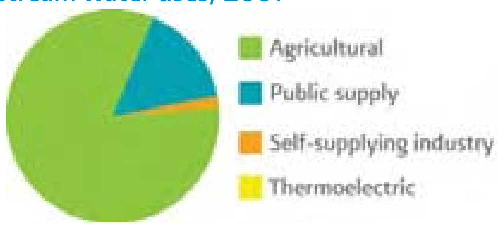
7. Chiapas

GENERAL DATA

2007 population (inhabitants)

Total	4 435 911	
Urban	2 145 041	
Rural	2 290 870	
Number of municipalities	118	
Population in 2030	5 297 905	inhabitants
Normal annual precipitation 1971-2000	1763.9	mm

Offstream water uses, 2007



Agricultural	1 386	hm³/year	(82.7%)
Public supply	261	hm³/year	(15.6%)
Self-supplying industry	29	hm³/year	(1.8%)
Thermoelectric	0	hm³/year	(0.0%)
Total	1 677	hm³/year	(100.0%)

Drinking water and sanitation, 2005

Drinking water coverage

State-wide	73.5	%
Urban	86.2	%
Rural	61.9	%

Sanitation coverage

State-wide	74.7	%
Urban	94.1	%
Rural	57.0	%

Treatment plants (up to December 2007)

Municipal treatment plants

Number in operation	4	
Installed capacity	4.500	m^3/s
Flow treated	2.510	m^3/s

Municipal wastewater

Number in operation	24	
Installed capacity	1.51	m^3/s
Flow treated	1.18	m^3/s

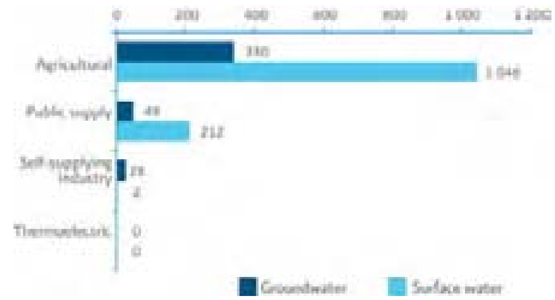
Industrial wastewater

Number in operation	18	
Installed capacity	0.69	m^3/s
Flow treated	0.69	m^3/s

Location in Mexico

Origen of the water used, 2007

Surface water	1 260 hm³/year (75.1%)
Groundwater	417 hm³/year (24.9%)

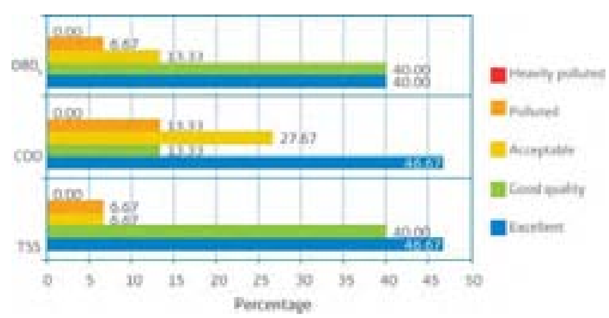


Surface water quality, 2007

Number of water quality monitoring sites

BOD_5	15
COD	15
TSS	15

Percentage distribution of the monitoring sites by indicator and classification scale of water quality

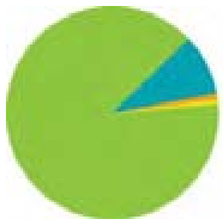


8. Chihuahua

GENERAL DATA

2007 population (inhabitants)		
Total	3 343 408	
Urban	2 833 519	
Rural	509 890	
Number of municipalities	67	
Population in 2030	3 843 745	inhabitants
Normal annual precipitation 1971-2000	462.0	mm

Offstream water uses, 2007



Agricultural	4 593	hm³/year	(89.2%)
Public supply	476	hm³/year	(9.2%)
Self-supplying industry	52	hm³/year	(1.0%)
Thermoelectric	28	hm³/year	(0.5%)
Total	5 148	hm³/year	(100.0%)

Drinking water and sanitation, 2005

Drinking water coverage		
State-wide	92.9	%
Urban	98.1	%
Rural	65.6	%
Sanitation coverage		
State-wide	89.8	%
Urban	96.5	%
Rural	54.4	%

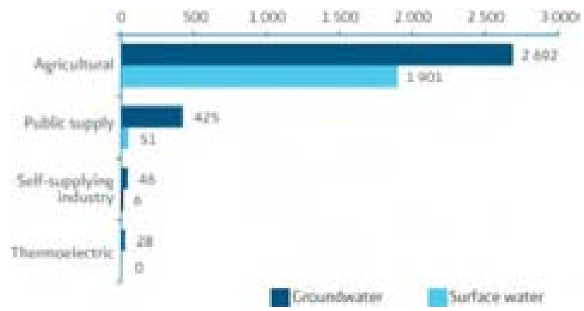
Treatment plants (up to December 2007)

Municipal treatment plants		
Number in operation	4	
Installed capacity	0.650	m^3/s
Flow treated	0.380	m^3/s
Municipal wastewater		
Number in operation	119	
Installed capacity	8.72	m^3/s
Flow treated	6.31	m^3/s
Industrial wastewater		
Number in operation	20	
Installed capacity	0.66	m^3/s
Flow treated	0.29	m^3/s

Location in Mexico

Origen of the water used, 2007

Surface water	1 958 hm³/year (38.0%)
Groundwater	3 191 hm³/year (62.0%)

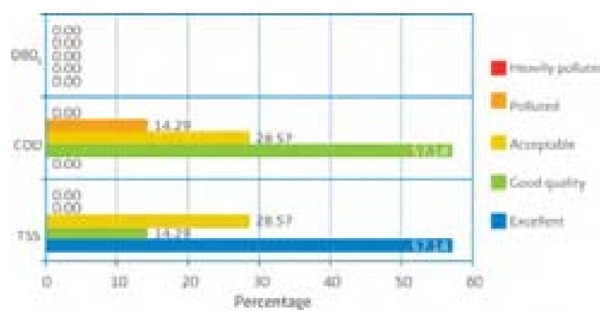


Surface water quality, 2007

Number of water quality monitoring sites

BOD_5	
COD	7
TSS	7

Percentage distribution of the monitoring sites by indicator and classification scale of water quality



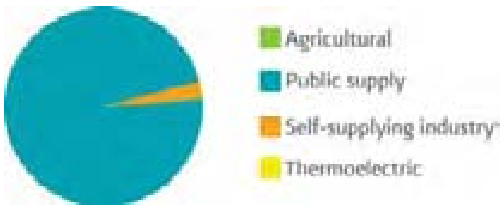
9. Federal District

GENERAL DATA

2007 population (inhabitants)

Total	8 832 734	
Urban	8 800 994	
Rural	31 741	
Number of municipalities	16	
Population in 2030	8 587 531	inhabitants
Normal annual precipitation 1971-2000	937.4	mm

Offstream water uses, 2007



Agricultural	1	hm³/year	(0.1%)
Public supply	1 090	hm³/year	(97.1%)
Self-supplying industry	32	hm³/year	(2.8%)
Thermoelectric	0	hm³/year	(0.0%)
Total	1 123	hm³/year	(100.0%)

Drinking water and sanitation, 2005

Drinking water coverage

State-wide	97.6	%
Urban	97.8	%
Rural	41.7	%

Sanitation coverage

State-wide	98.6	%
Urban	98.6	%
Rural	86.6	%

Treatment plants (up to December 2007)

Municipal treatment plants

Number in operation	33	
Installed capacity	3.657	m^3/s
Flow treated	3.009	m^3/s

Municipal wastewater

Number in operation	27	
Installed capacity	6.48	m^3/s
Flow treated	2.81	m^3/s

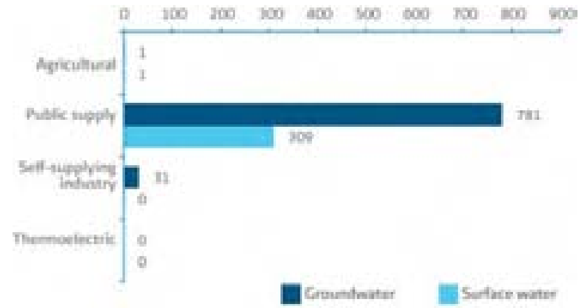
Industrial wastewater

Number in operation	123	
Installed capacity	0.42	m^3/s
Flow treated	0.41	m^3/s

Location in Mexico

Origen of the water used, 2007

Surface water	310 hm³/year (27.6%)
Groundwater	813 hm³/year (72.4%)

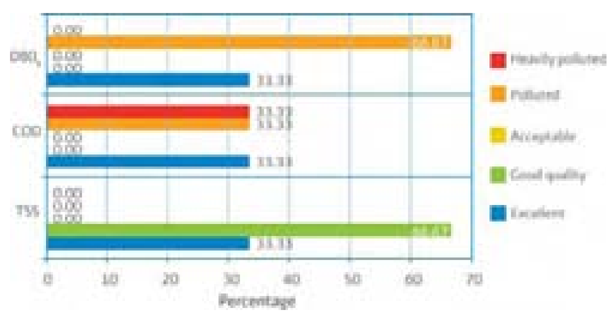


Surface water quality, 2007

Number of water quality monitoring sites

BOD_5	3
COD	3
TSS	3

Percentage distribution of the monitoring sites by indicator and classification scale of water quality



10. Durango

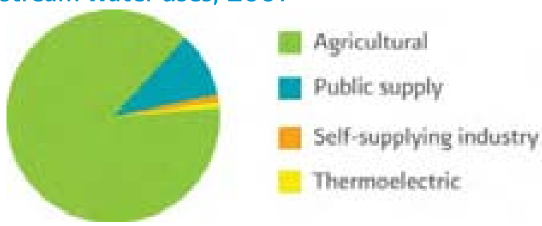
GENERAL DATA

2007 population (inhabitants)

Total	1 541 433	
Urban	1 051 355	
Rural	490 078	
Number of municipalities	39	
Population in 2030	1 582 932	inhabitants
Normal annual precipitation 1971-2000	570.6	mm

Location in Mexico

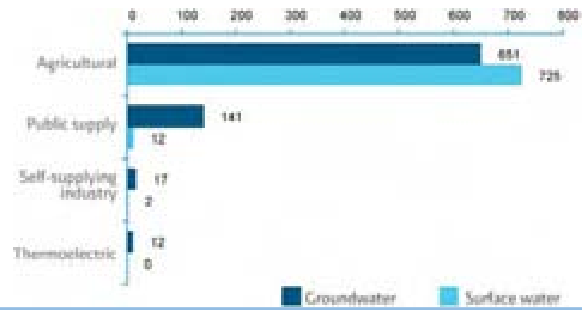
Offstream water uses, 2007



Agricultural	1 375	hm³/year	(88.2%)
Public supply	153	hm³/year	(9.8%)
Self-supplying industry	19	hm³/year	(1.2%)
Thermoelectric	12	hm³/year	(0.7%)
Total	1 559	hm³/year	(100.0%)

Origen of the water used, 2007

Surface water	739 hm³/year (47.4%)
Groundwater	820 hm³/year (52.6%)



Drinking water and sanitation, 2005

Drinking water coverage

State-wide	90.9	%
Urban	98.9	%
Rural	74.8	%

Sanitation coverage

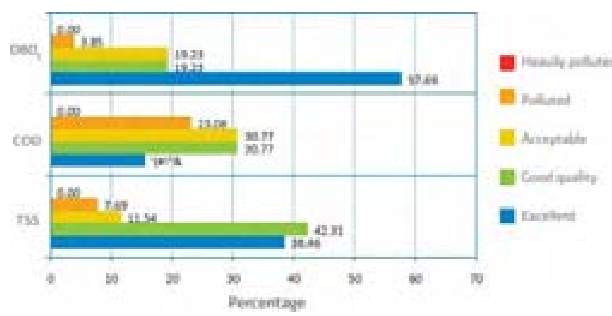
State-wide	82.6	%
Urban	95.4	%
Rural	56.9	%

Surface water quality, 2007

Number of water quality monitoring sites

BOD_5	26
COD	26
TSS	26

Percentage distribution of the monitoring sites by indicator and classification scale of water quality



Treatment plants (up to December 2007)

Municipal treatment plants

Number in operation	30	
Installed capacity	0.030	m^3/s
Flow treated	0.022	m^3/s

Municipal wastewater

Number in operation	165	
Installed capacity	3.53	m^3/s
Flow treated	2.58	m^3/s

Industrial wastewater

Number in operation	33	
Installed capacity	0.68	m^3/s
Flow treated	0.34	m^3/s

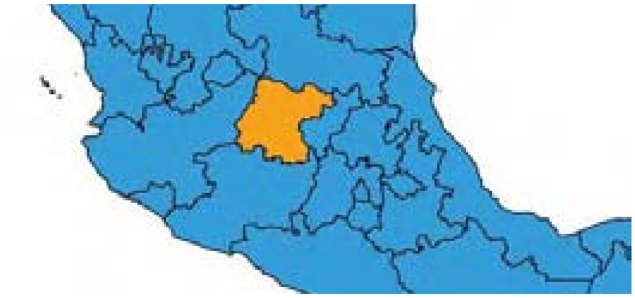
11. Guanajuato

GENERAL DATA

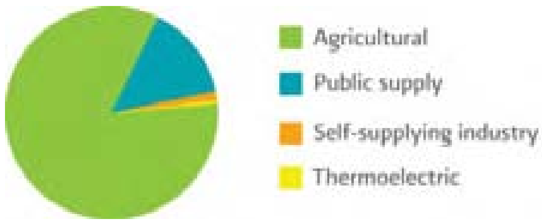
2007 population (inhabitants)

Total	5 008 063	
Urban	3 520 249	
Rural	1 487 014	
Number of municipalities	46	
Population in 2030	5 278 030	inhabitants
Normal annual precipitation 1971-2000	596.8	mm

Location in Mexico



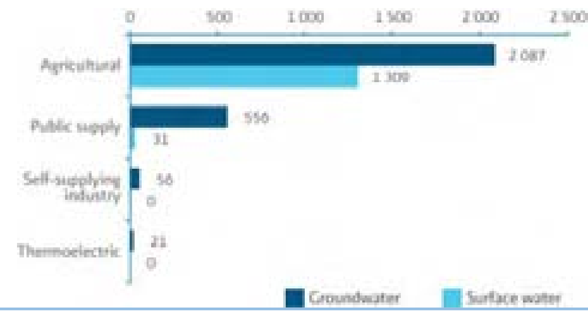
Offstream water uses, 2007



Agricultural	3 396	hm³/year	(83.7%)
Public supply	587	hm³/year	(14.5%)
Self-supplying industry	56	hm³/year	(1.4%)
Thermoelectric	21	hm³/year	(0.5%)
Total	4 059	hm³/year	(100.0%)

Origen of the water used, 2007

Surface water	1 340 hm³/year (33.0%)
Groundwater	2 719 hm³/year (67.0%)



Drinking water and sanitation, 2005

Drinking water coverage

State-wide	93.4	%
Urban	96.8	%
Rural	85.7	%

Sanitation coverage

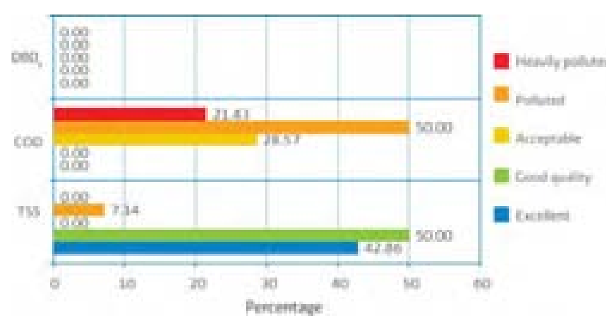
State-wide	85.8	%
Urban	96.6	%
Rural	61.1	%

Surface water quality, 2007

Number of water quality monitoring sites

BOD_5	
COD	14
TSS	14

Percentage distribution of the monitoring sites by indicator and classification scale of water quality



Treatment plants (up to December 2007)

Municipal treatment plants

Number in operation	9	
Installed capacity	0.337	m^3/s
Flow treated	0.279	m^3/s

Municipal wastewater

Number in operation	36	
Installed capacity	5.74	m^3/s
Flow treated	4.26	m^3/s

Industrial wastewater

Number in operation	45	
Installed capacity	0.40	m^3/s
Flow treated	0.18	m^3/s

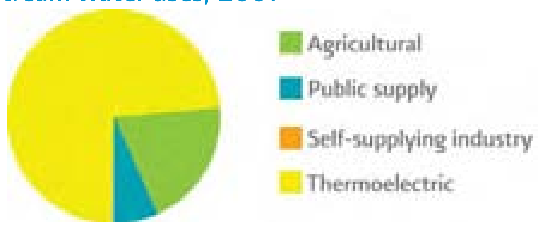
12. Guerrero

GENERAL DATA

2007 population (inhabitants)

Total	3 147 680	
Urban	1 806 389	
Rural	1 341 291	
Number of municipalities	81	
Population in 2030	2 887 844	inhabitants
Normal annual precipitation 1971-2000	1195.0	mm

Offstream water uses, 2007



Agricultural	838	hm³/year	(19.7%)
Public supply	287	hm³/year	(6.7%)
Self-supplying industry	13	hm³/year	(0.3%)
Thermoelectric	3 122	hm³/year	(73.3%)
Total	4 260	hm³/year	(100.0%)

Drinking water and sanitation, 2005

Drinking water coverage		
State-wide	68.0	%
Urban	81.3	%
Rural	50.4	%
Sanitation coverage		
State-wide	64.2	%
Urban	85.0	%
Rural	36.6	%

Treatment plants (up to December 2007)

Municipal treatment plants		
Number in operation	11	
Installed capacity	3.278	m^3/s
Flow treated	2.973	m^3/s
Municipal wastewater		
Number in operation	35	
Installed capacity	1.94	m^3/s
Flow treated	1.07	m^3/s
Industrial wastewater		
Number in operation	7	
Installed capacity	0.05	m^3/s
Flow treated	0.04	m^3/s

Location in Mexico

Origen of the water used, 2007

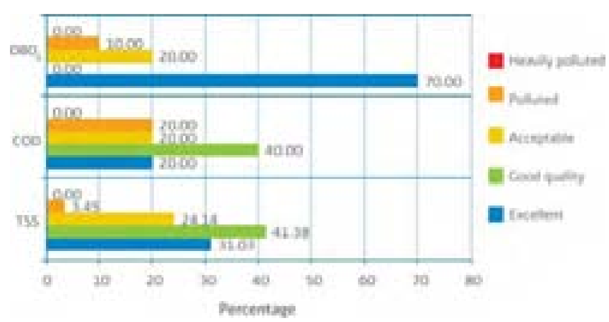
Surface water	4 033 hm³/year (94.7%)
Groundwater	226 hm³/year (5.3%)

Surface water quality, 2007

Number of water quality monitoring sites

BOD_5	10
COD	10
TSS	29

Percentage distribution of the monitoring sites by indicator and classification scale of water quality



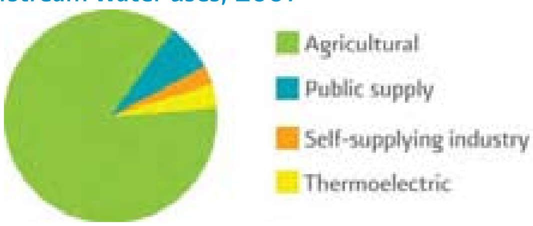
13. Hidalgo

GENERAL DATA

2007 population (inhabitants)

Total	2 402 682	
Urban	1 279 780	
Rural	1 122 902	
Number of municipalities	84	
Population in 2030	2 573 581	inhabitants
Normal annual precipitation 1971-2000	831.8	mm

Offstream water uses, 2007



Agricultural	2 020	hm³/year	(86.4%)
Public supply	168	hm³/year	(7.2%)
Self-supplying industry	66	hm³/year	(2.8%)
Thermoelectric	83	hm³/year	(3.5%)
Total	2 337	hm³/year	(100.0%)

Drinking water and sanitation, 2005

Drinking water coverage

State-wide	87.2	%
Urban	96.3	%
Rural	77.5	%

Sanitation coverage

State-wide		
Urban	94.8	%
Rural	62.1	%

Treatment plants (up to December 2007)

Municipal treatment plants

Number in operation	2	
Installed capacity	0.130	m^3/s
Flow treated	0.130	m^3/s

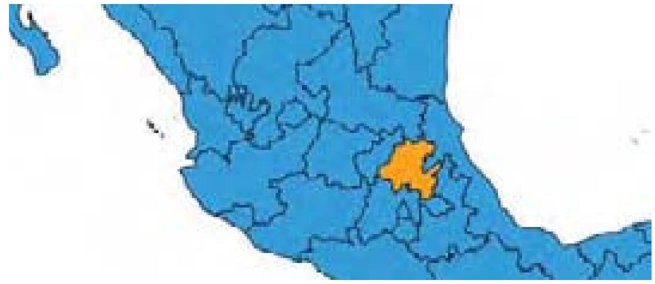
Municipal wastewater

Number in operation	12	
Installed capacity	0.22	m^3/s
Flow treated	0.21	m^3/s

Industrial wastewater

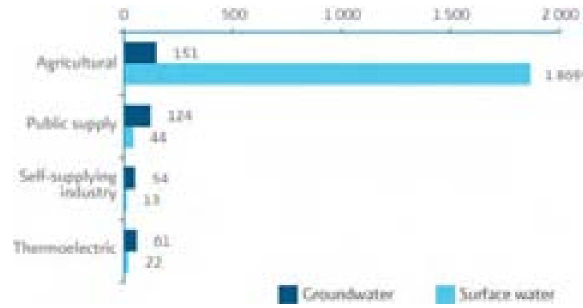
Number in operation	41	
Installed capacity	1.65	m^3/s
Flow treated	0.98	m^3/s

Location in Mexico



Origen of the water used, 2007

Surface water	1 947 hm³/year (83.3%)
Groundwater	389 hm³/year (16.7%)

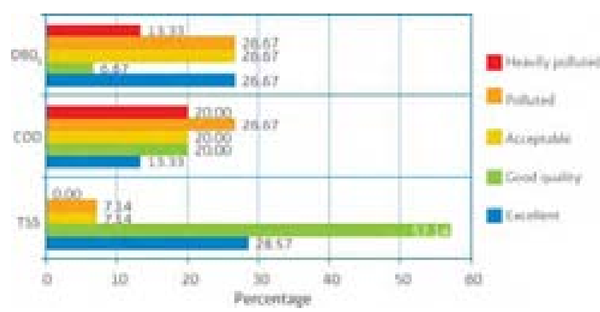


Surface water quality, 2007

Number of water quality monitoring sites

BOD_5	15
COD	15
TSS	14

Percentage distribution of the monitoring sites by indicator and classification scale of water quality



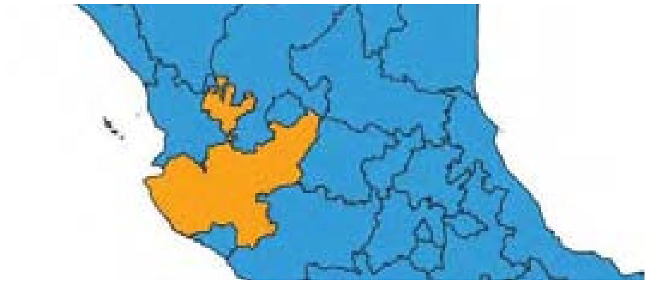
14. Jalisco

GENERAL DATA

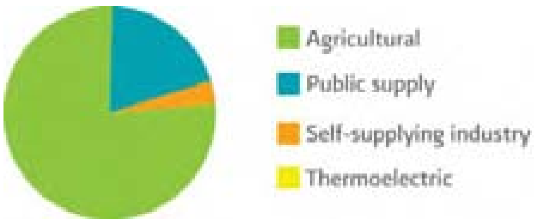
2007 population (inhabitants)

Total	6 931 957	
Urban	6 006 660	
Rural	925 297	
Number of municipalities	125	
Population in 2030	7 799 254	inhabitants
Normal annual precipitation 1971-2000	893.1	mm

Location in Mexico



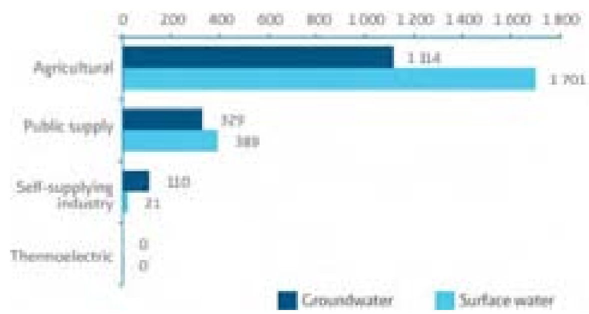
Offstream water uses, 2007



Agricultural	2 815	hm³/year	(76.8%)
Public supply	718	hm³/year	(19.6%)
Self-supplying industry	131	hm³/year	(3.6%)
Thermoelectric	0	hm³/year	(0.0%)
Total	3 664	hm³/year	(100.0%)

Origen of the water used, 2007

Surface water	2 111 hm³/year (57.6%)
Groundwater	1 553 hm³/year (42.4%)



Drinking water and sanitation, 2005

Drinking water coverage

State-wide	93.3	%
Urban	95.8	%
Rural	77.9	%

Sanitation coverage

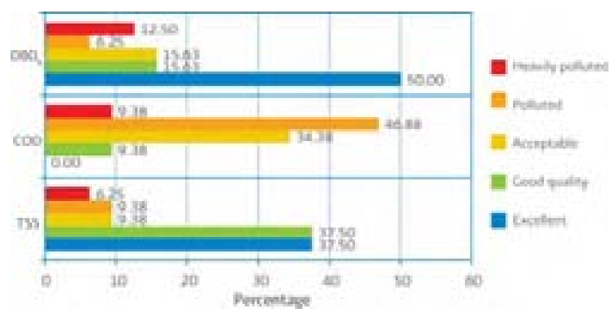
State-wide	95.8	%
Urban	98.2	%
Rural	81.0	%

Surface water quality, 2007

Number of water quality monitoring sites

BOD_5	32
COD	32
TSS	32

Percentage distribution of the monitoring sites by indicator and classification scale of water quality



Treatment plants (up to December 2007)

Municipal treatment plants

Number in operation	24	
Installed capacity	16.197	m^3/s
Flow treated	9.490	m^3/s

Municipal wastewater

Number in operation	96	
Installed capacity	3.77	m^3/s
Flow treated	3.39	m^3/s

Industrial wastewater

Number in operation	33	
Installed capacity	1.51	m^3/s
Flow treated	1.51	m^3/s

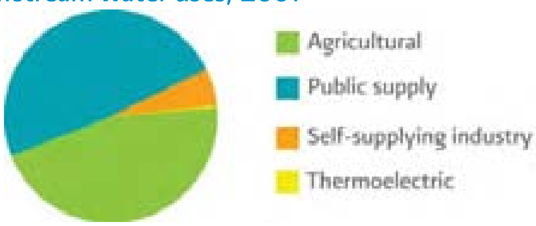
15. State of Mexico

GENERAL DATA

2007 population (inhabitants)

Total	14 536 860	
Urban	12 691 665	
Rural	1 845 195	
Number of municipalities	125	
Population in 2030	18 114 304	inhabitants
Normal annual precipitation 1971-2000	850.6	mm

Offstream water uses, 2007



Agricultural	1 250	hm³/year	(45.4%)
Public supply	1 338	hm³/year	(48.6%)
Self-supplying industry	156	hm³/year	(5.7%)
Thermoelectric	7	hm³/year	(0.3%)
Total	2 752	hm³/year	(100.0%)

Drinking water and sanitation, 2005

Drinking water coverage

State-wide	93.2	%
Urban	95.6	%
Rural	77.4	%

Sanitation coverage

State-wide	91.2	%
Urban	96.0	%
Rural	59.9	%

Treatment plants (up to December 2007)

Municipal treatment plants

Number in operation	10	
Installed capacity	22.144	m^3/s
Flow treated	16.719	m^3/s

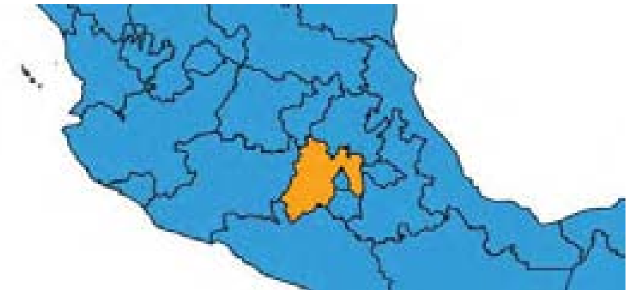
Municipal wastewater

Number in operation	75	
Installed capacity	7.22	m^3/s
Flow treated	4.90	m^3/s

Industrial wastewater

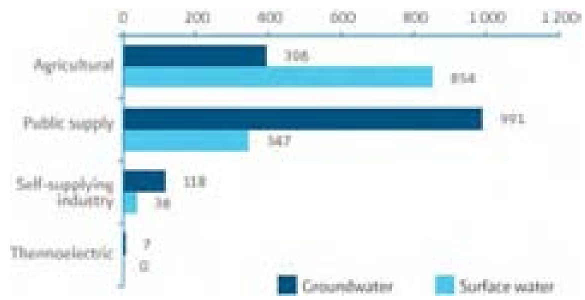
Number in operation	292	
Installed capacity	3.75	m^3/s
Flow treated	2.75	m^3/s

Location in Mexico



Origen of the water used, 2007

Surface water	1 240 hm³/year (45.1%)
Groundwater	1 512 hm³/year (54.9%)

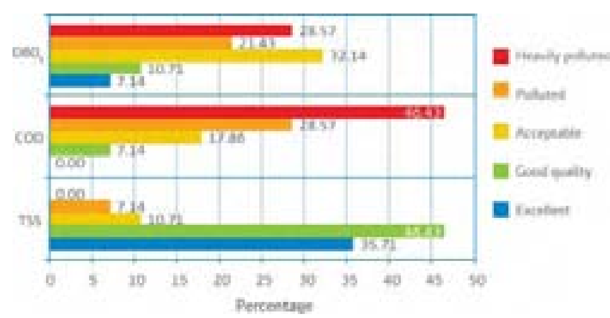


Surface water quality, 2007

Number of water quality monitoring sites

BOD_5	28
COD	28
TSS	28

Percentage distribution of the monitoring sites by indicator and classification scale of water quality



16. Michoacan de Ocampo

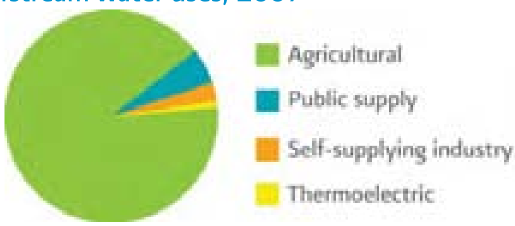
GENERAL DATA

2007 population (inhabitants)

Total	3 984 577	
Urban	2 714 286	
Rural	1 270 291	
Number of municipalities	113	
Population in 2030	3 538 187	inhabitants
Normal annual precipitation 1971-2000	911.1	mm

Location in Mexico

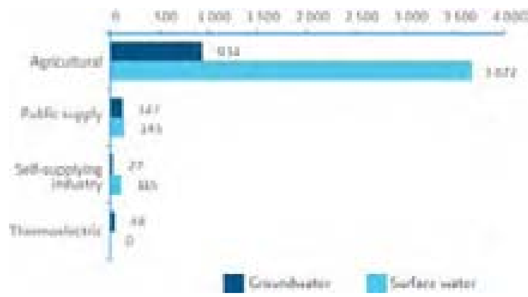
Offstream water uses, 2007



Agricultural	4 607	hm³/year	(90.9%)
Public supply	272	hm³/year	(5.4%)
Self-supplying industry	142	hm³/year	(2.8%)
Thermoelectric	48	hm³/year	(1.0%)
Total	5 069	hm³/year	(100.0%)

Origen of the water used, 2007

Surface water	3 933 hm³/year (77.6%)
Groundwater	1 136Mill. m³/año (22.4%)



Drinking water and sanitation, 2005

Drinking water coverage

State-wide	89.4	%
Urban	95.1	%
Rural	77.7	%

Sanitation coverage

State-wide	84.2	%
Urban	93.0	%
Rural	66.1	%

Surface water quality, 2007

Number of water quality monitoring sites

BOD_5	20
COD	20
TSS	23

Percentage distribution of the monitoring sites by indicator and classification scale of water quality

Treatment plants (up to December 2007)

Municipal treatment plants

Number in operation	6	
Installed capacity	2.945	m³/s
Flow treated	2.495	m³/s

Municipal wastewater

Number in operation	25	
Installed capacity	3.52	m³/s
Flow treated	2.47	m³/s

Industrial wastewater

Number in operation	45	
Installed capacity	3.55	m³/s
Flow treated	2.47	m³/s

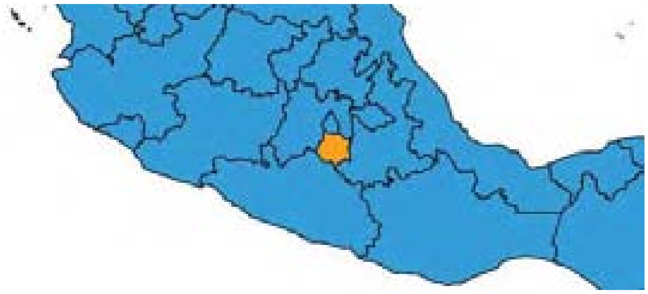
17. Morelos

GENERAL DATA

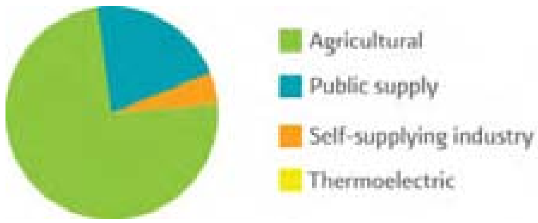
2007 population (inhabitants)

Total	1 655 138	
Urban	1 429 951	
Rural	225 188	
Number of municipalities	33	
Population in 2030	1 858 697	inhabitants
Normal annual precipitation 1971-2000	981.4	mm

Location in Mexico



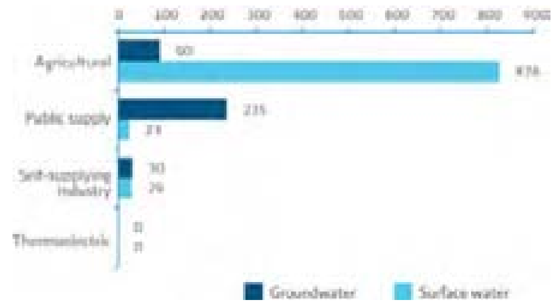
Offstream water uses, 2007



Agricultural	916	hm³/year	(74.3%)
Public supply	258	hm³/year	(21.0%)
Self-supplying industry	59	hm³/year	(4.8%)
Thermoelectric	0	hm³/year	(0.0%)
Total	1 234	hm³/year	(100.0%)

Origen of the water used, 2007

Surface water	878 hm³/year (71.2%)
Groundwater	355 hm³/year (28.8%)



Drinking water and sanitation, 2005

Drinking water coverage

State-wide	91.6	%
Urban	94.8	%
Rural	72.4	%

Sanitation coverage

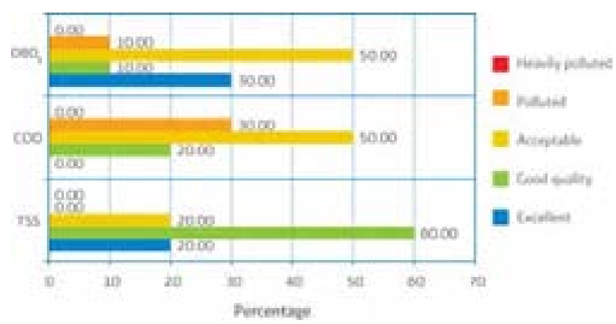
State-wide	92.6	%
Urban	95.1	%
Rural	77.2	%

Surface water quality, 2007

Number of water quality monitoring sites

BOD_5	10
COD	10
TSS	10

Percentage distribution of the monitoring sites by indicator and classification scale of water quality



Treatment plants (up to December 2007)

Municipal treatment plants

Number in operation	0	
Installed capacity	0.000	m^3/s
Flow treated	0.000	m^3/s

Municipal wastewater

Number in operation	27	
Installed capacity	1.33	m^3/s
Flow treated	1.06	m^3/s

Industrial wastewater

Number in operation	80	
Installed capacity	2.83	m^3/s
Flow treated	2.72	m^3/s

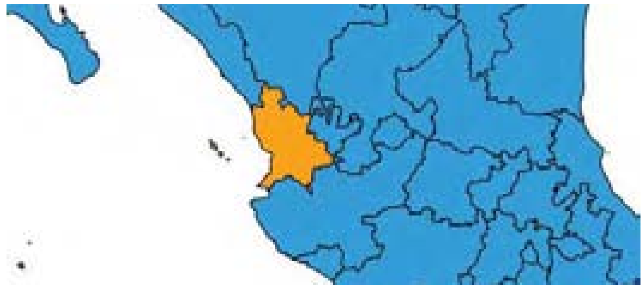
18. Nayarit

GENERAL DATA

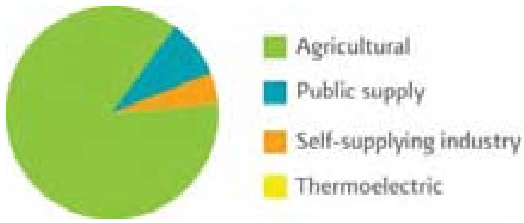
2007 population (inhabitants)

Total	965 641	
Urban	652 950	
Rural	312 691	
Number of municipalities	20	
Population in 2030	987 760	inhabitants
Normal annual precipitation 1971-2000	1185.8	mm

Location in Mexico



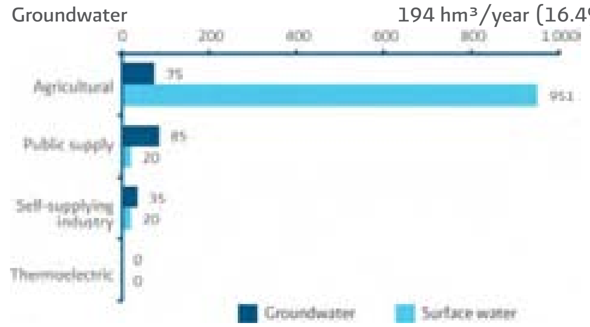
Offstream water uses, 2007



Agricultural	1 026	hm³/year	(86.5%)
Public supply	105	hm³/year	(8.8%)
Self-supplying industry	56	hm³/year	(4.7%)
Thermoelectric	0	hm³/year	(0.0%)
Total	1 187	hm³/year	(100.0%)

Origen of the water used, 2007

Surface water	992 hm³/year (83.6%)
Groundwater	194 hm³/year (16.4%)



Drinking water and sanitation, 2005

Drinking water coverage

State-wide	91.4	%
Urban	96.5	%
Rural	81.2	%

Sanitation coverage

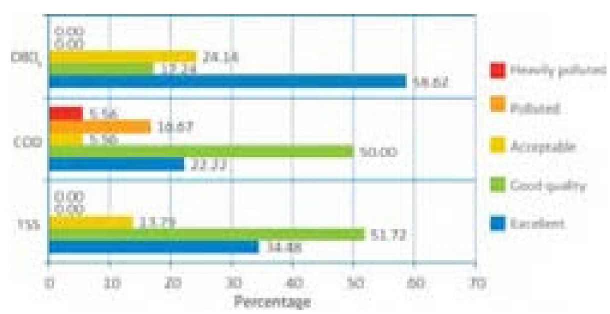
State-wide	90.9	%
Urban	97.7	%
Rural	77.6	%

Surface water quality, 2007

Number of water quality monitoring sites

BOD_5	29
COD	18
TSS	29

Percentage distribution of the monitoring sites by indicator and classification scale of water quality



Treatment plants (up to December 2007)

Municipal treatment plants

Number in operation	0	
Installed capacity	0.000	m^3/s
Flow treated	0.000	m^3/s

Municipal wastewater

Number in operation	60	
Installed capacity	1.96	m^3/s
Flow treated	1.20	m^3/s

Industrial wastewater

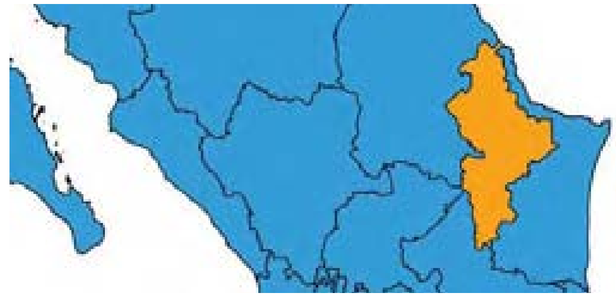
Number in operation	4	
Installed capacity	0.16	m^3/s
Flow treated	0.16	m^3/s

19. Nuevo Leon

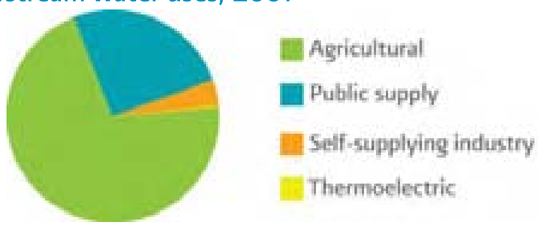
GENERAL DATA

2007 population (inhabitants)		
Total	4 365 090	
Urban	4 124 946	
Rural	240 144	
Number of municipalities	51	
Population in 2030	5 406 220	inhabitants
Normal annual precipitation 1971-2000	584.5	mm

Location in Mexico



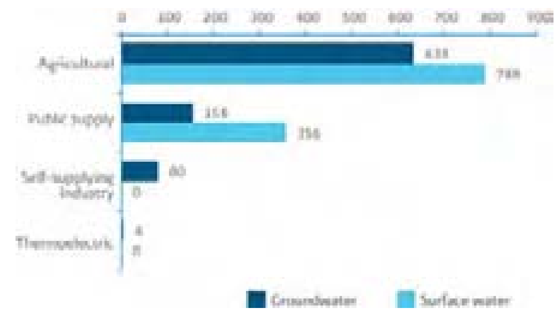
Offstream water uses, 2007



Agricultural	1 422	hm³/year	(70.5%)
Public supply	512	hm³/year	(25.4%)
Self-supplying industry	80	hm³/year	(4.0%)
Thermoelectric	4	hm³/year	(0.2%)
Total	2 018	hm³/year	(100.0%)

Origen of the water used, 2007

Surface water	1 144 hm³/year (56.7%)
Groundwater	874 hm³/year (43.3%)



Drinking water and sanitation, 2005

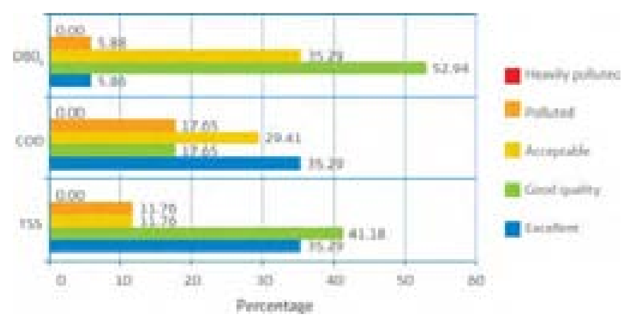
Drinking water coverage		
State-wide	95.6	%
Urban	97.7	%
Rural	60.5	%
Sanitation coverage		
State-wide	95.3	%
Urban	97.5	%
Rural	57.8	%

Surface water quality, 2007

Number of water quality monitoring sites

BOD_5	17
COD	17
TSS	17

Percentage distribution of the monitoring sites by indicator and classification scale of water quality



Treatment plants (up to December 2007)

Municipal treatment plants		
Number in operation	8	
Installed capacity	14.404	m^3/s
Flow treated	7.149	m^3/s
Municipal wastewater		
Number in operation	61	
Installed capacity	13.09	m^3/s
Flow treated	11.87	m^3/s
Industrial wastewater		
Number in operation	83	
Installed capacity	4.13	m^3/s
Flow treated	3.00	m^3/s

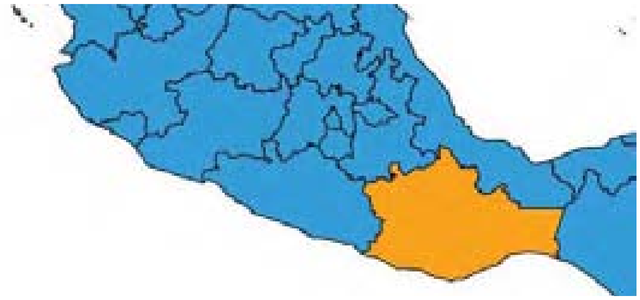
20. Oaxaca

GENERAL DATA

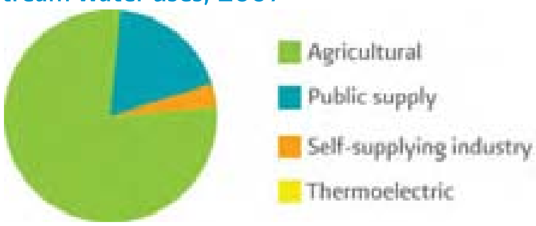
2007 population (inhabitants)

Total	3 552 685	
Urban	1 687 230	
Rural	1 865 455	
Number of municipalities	570	
Population in 2030	3 402 505	inhabitants
Normal annual precipitation 1971-2000	1181.8	mm

Location in Mexico



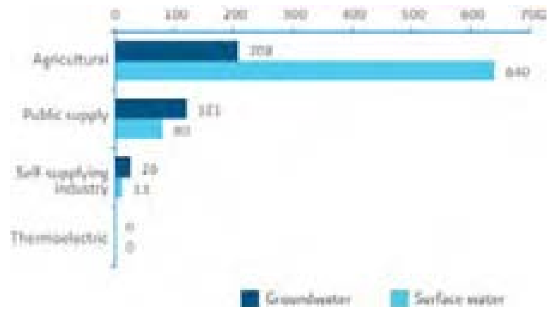
Offstream water uses, 2007



Agricultural	848	hm³/year	(77.9%)
Public supply	201	hm³/year	(18.5%)
Self-supplying industry	39	hm³/year	(3.6%)
Thermoelectric	0	hm³/year	(0.0%)
Total	1 088	hm³/year	(100.0%)

Origen of the water used, 2007

Surface water	732 hm³/year (67.3%)
Groundwater	355 hm³/year (32.7%)



Drinking water and sanitation, 2005

Drinking water coverage

State-wide	73.3	%
Urban	84.7	%
Rural	63.4	%

Sanitation coverage

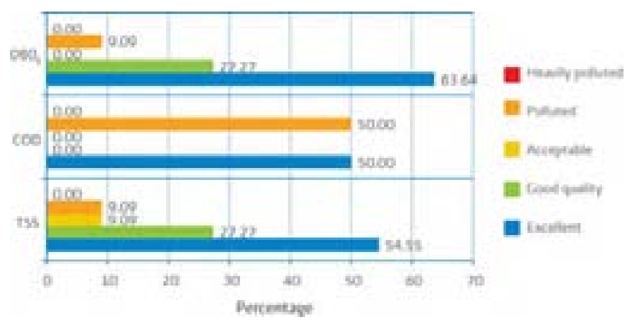
State-wide	60.0	%
Urban	84.0	%
Rural	39.2	%

Surface water quality, 2007

Number of water quality monitoring sites

BOD_5	11
COD	2
TSS	11

Percentage distribution of the monitoring sites by indicator and classification scale of water quality



Treatment plants (up to December 2007)

Municipal treatment plants

Number in operation	6	
Installed capacity	1.291	m^3/s
Flow treated	0.771	m^3/s

Municipal wastewater

Number in operation	65	
Installed capacity	0.91	m^3/s
Flow treated	0.69	m^3/s

Industrial wastewater

Number in operation	13	
Installed capacity	1.08	m^3/s
Flow treated	0.76	m^3/s

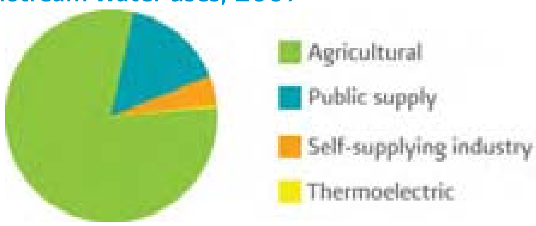
21. Puebla

GENERAL DATA

2007 population (inhabitants)

Total	5 567 191	
Urban	3 985 932	
Rural	1 581 259	
Number of municipalities	217	
Population in 2030	6 536 966	inhabitants
Normal annual precipitation 1971-2000	1034.1	mm

Offstream water uses, 2007



Agricultural	1 989	hm³/year	(79.8%)
Public supply	383	hm³/year	(15.4%)
Self-supplying industry	114	hm³/year	(4.6%)
Thermoelectric	6	hm³/year	(0.3%)
Total	2 492	hm³/year	(100.0%)

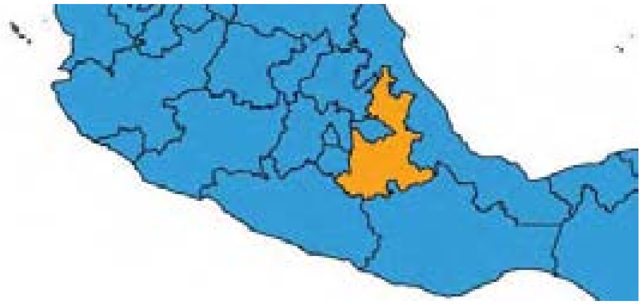
Drinking water and sanitation, 2005

Drinking water coverage		
State-wide	85.4	%
Urban	90.3	%
Rural	74.0	%
Sanitation coverage		
State-wide	79.0	%
Urban	89.9	%
Rural	53.6	%

Treatment plants (up to December 2007)

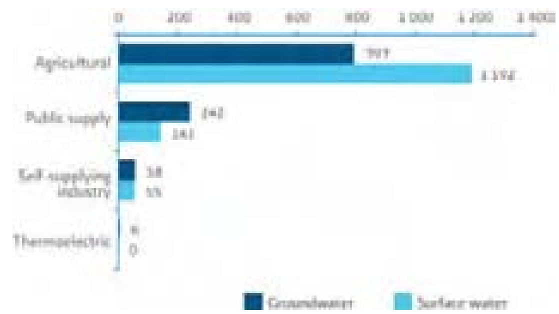
Municipal treatment plants		
Number in operation	4	
Installed capacity	0.715	m^3/s
Flow treated	0.545	m^3/s
Municipal wastewater		
Number in operation	67	
Installed capacity	3.02	m^3/s
Flow treated	2.42	m^3/s
Industrial wastewater		
Number in operation	97	
Installed capacity	0.62	m^3/s
Flow treated	0.43	m^3/s

Location in Mexico



Origen of the water used, 2007

Surface water	1 389 hm³/year (55.7%)
Groundwater	1 103 hm³/year (44.3%)

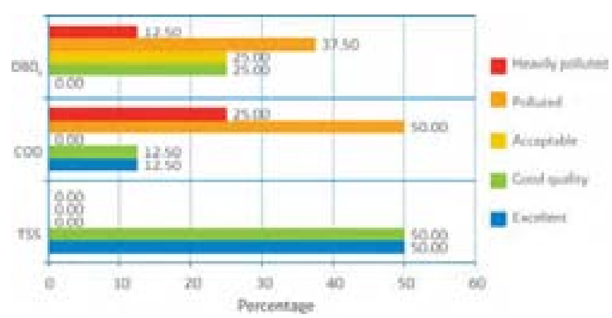


Surface water quality, 2007

Number of water quality monitoring sites

BOD_5	8
COD	8
TSS	8

Percentage distribution of the monitoring sites by indicator and classification scale of water quality



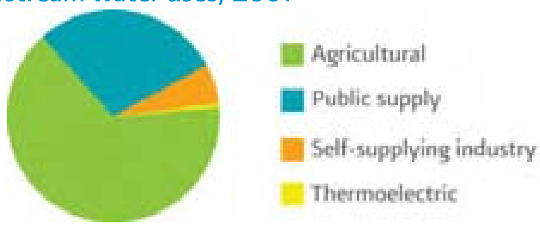
22. Queretaro Arteaga

GENERAL DATA

2007 population (inhabitants)

Total	1 674 737	
Urban	1 183 163	
Rural	491 574	
Number of municipalities	18	
Population in 2030	2 306 838	inhabitants
Normal annual precipitation 1971-2000	724.4	mm

Offstream water uses, 2007



Agricultural	660	hm³/year	(64.8%)
Public supply	292	hm³/year	(28.6%)
Self-supplying industry	61	hm³/year	(6.0%)
Thermoelectric	6	hm³/year	(0.6%)
Total	1 019	hm³/year	(100.0%)

Drinking water and sanitation, 2005

Drinking water coverage		
State-wide	93.7	%
Urban	97.9	%
Rural	84.3	%
Sanitation coverage		
State-wide	85.6	%
Urban	95.1	%
Rural	64.1	%

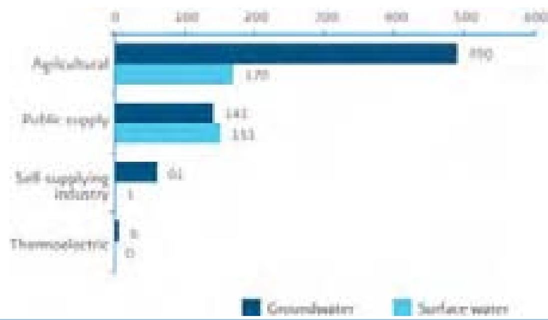
Treatment plants (up to December 2007)

Municipal treatment plants		
Number in operation	6	
Installed capacity	0.269	m³/s
Flow treated	0.212	m³/s
Municipal wastewater		
Number in operation	63	
Installed capacity	1.11	m³/s
Flow treated	0.71	m³/s
Industrial wastewater		
Number in operation	128	
Installed capacity	1.11	m³/s
Flow treated	0.51	m³/s

Location in Mexico

Origen of the water used, 2007

Surface water	322 hm³/year (31.6%)
Groundwater	697Mill. m³/año (68.4%)

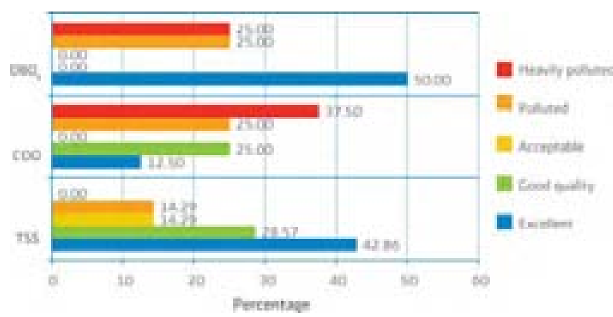


Surface water quality, 2007

Number of water quality monitoring sites

BOD_5	8
COD	8
TSS	7

Percentage distribution of the monitoring sites by indicator and classification scale of water quality

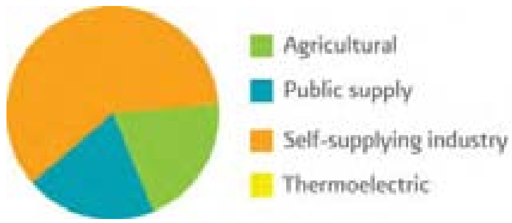


23. Quintana Roo

GENERAL DATA

2007 population (inhabitants)		
Total	1 243 989	
Urban	1 075 724	
Rural	168 265	
Number of municipalities	8	
Population in 2030	2 454 389	inhabitants
Normal annual precipitation 1971-2000	1234.4	mm

Offstream water uses, 2007



Agricultural	93	hm³/year	(20.2%)
Public supply	91	hm³/year	(19.8)
Self-supplying industry	276	hm³/year	(60.0)
Thermoelectric	0	hm³/year	(0.0%)
Total	460	hm³/year	(100.0%)

Drinking water and sanitation, 2005

Drinking water coverage		
State-wide	94.5	%
Urban	96.1	%
Rural	85.8	%
Sanitation coverage		
State-wide	89.5	%
Urban	95.9	%
Rural	53.9	%

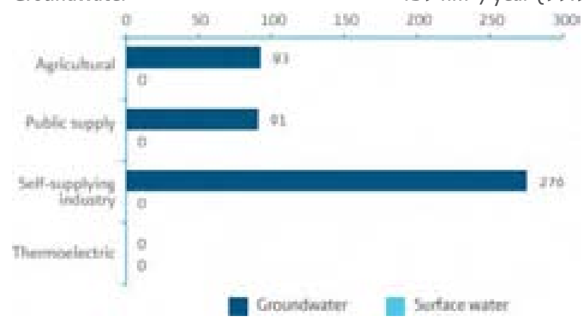
Treatment plants (up to December 2007)

Municipal treatment plants		
Number in operation	0	
Installed capacity	0.000	m^3/s
Flow treated	0.000	m^3/s
Municipal wastewater		
Number in operation	29	
Installed capacity	2.08	m^3/s
Flow treated	1.60	m^3/s
Industrial wastewater		
Number in operation	2	
Installed capacity	0.01	m^3/s
Flow treated	0.01	m^3/s

Location in Mexico

Origen of the water used, 2007

Surface water	1 hm³/year (0.1%)
Groundwater	459 hm³/year (99.9%)

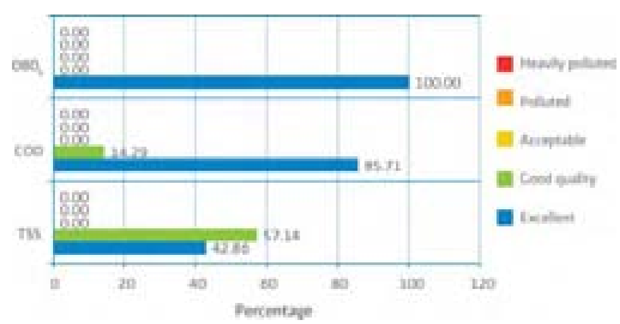


Surface water quality, 2007

Number of water quality monitoring sites

BOD_5	7
COD	7
TSS	7

Percentage distribution of the monitoring sites by indicator and classification scale of water quality



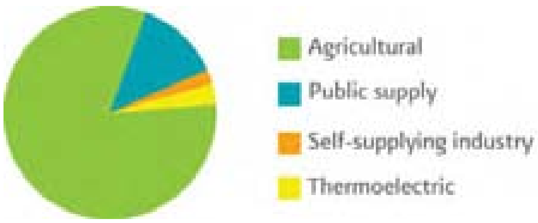
24. San Luis Potosi

GENERAL DATA

2007 population (inhabitants)

Total	2 467 651	
Urban	1 559 547	
Rural	908 104	
Number of municipalities	58	
Population in 2030	2 598 934	inhabitants
Normal annual precipitation 1971-2000	692.5	mm

Offstream water uses, 2007



Agricultural	1 092	hm³/year	(81.9%)
Public supply	171	hm³/year	(12.8%)
Self-supplying industry	29	hm³/year	(2.2%)
Thermoelectric	41	hm³/year	(3.1%)
Total	1 333	hm³/year	(100.0%)

Drinking water and sanitation, 2005

Drinking water coverage

State-wide	82.7	%
Urban	97.5	%
Rural	58.2	%

Sanitation coverage

State-wide	74.2	%
Urban	93.2	%
Rural	42.8	%

Treatment plants (up to December 2007)

Municipal treatment plants

Number in operation	14	
Installed capacity	1.135	m^3/s
Flow treated	0.819	m^3/s

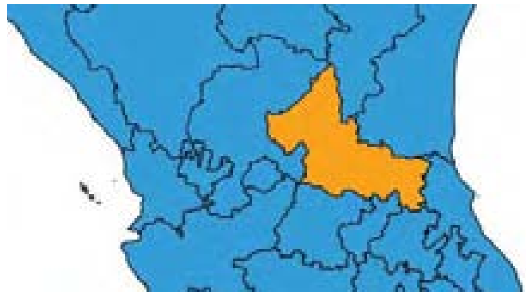
Municipal wastewater

Number in operation	19	
Installed capacity	2.10	m^3/s
Flow treated	1.73	m^3/s

Industrial wastewater

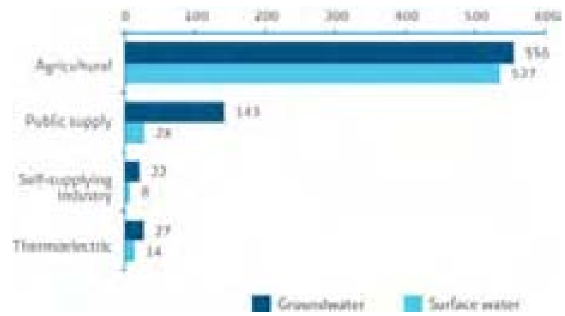
Number in operation	74	
Installed capacity	1.36	m^3/s
Flow treated	0.63	m^3/s

Location in Mexico



Origen of the water used, 2007

Surface water	587 hm³/year (44.0%)
Groundwater	747 hm³/year (56.0%)

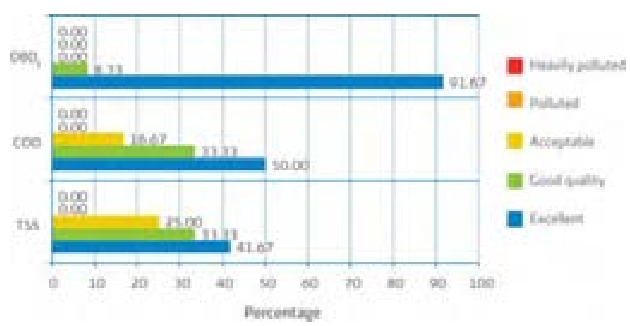


Surface water quality, 2007

Number of water quality monitoring sites

BOD_5	12
COD	12
TSS	12

Percentage distribution of the monitoring sites by indicator and classification scale of water quality

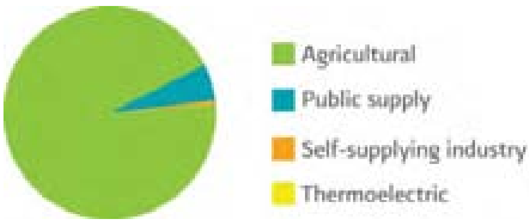


25. Sinaloa

GENERAL DATA

2007 population (inhabitants)		
Total	2 645 933	
Urban	1 881 246	
Rural	764 688	
Number of municipalities	18	
Population in 2030	2 612 436	inhabitants
Normal annual precipitation 1971-2000	730.1	mm

Offstream water uses, 2007



Agricultural	8 608	hm³/year	(93.9%)
Public supply	510	hm³/year	(5.6%)
Self-supplying industry	46	hm³/year	(0.5%)
Thermoelectric	0	hm³/year	(0.0%)
Total	9 164	hm³/year	(100.0%)

Drinking water and sanitation, 2005

Drinking water coverage		
State-wide	93.1	%
Urban	98.3	%
Rural	80.6	%
Sanitation coverage		
State-wide	86.4	%
Urban	94.8	%
Rural	66.3	%

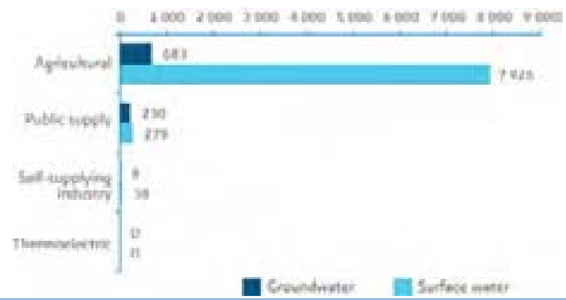
Treatment plants (up to December 2007)

Municipal treatment plants		
Number in operation	142	
Installed capacity	9.067	m^3/s
Flow treated	7.224	m^3/s
Municipal wastewater		
Number in operation	120	
Installed capacity	5.02	m^3/s
Flow treated	4.18	m^3/s
Industrial wastewater		
Number in operation	42	
Installed capacity	8.82	m^3/s
Flow treated	0.46	m^3/s

Location in Mexico

Origen of the water used, 2007

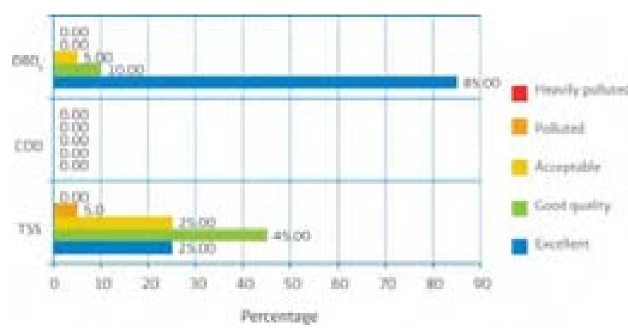
Surface water	8 243 hm³/year (89.9%)
Groundwater	921 hm³/year (10.1%)



Surface water quality, 2007

Number of water quality monitoring sites	
BOD_5	20
COD	
TSS	20

Percentage distribution of the monitoring sites by indicator and classification scale of water quality



26. Sonora

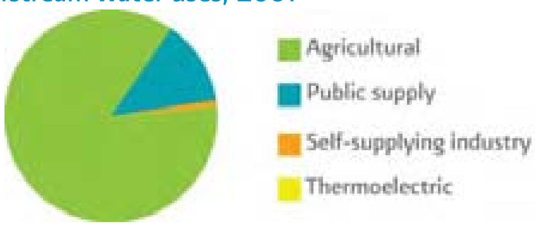
GENERAL DATA

2007 population (inhabitants)

Total	2 475 568	
Urban	2 132 045	
Rural	343 613	
Number of municipalities	72	
Population in 2030	2 845 433	inhabitants
Normal annual precipitation 1971-2000	421.2	mm

Location in Mexico

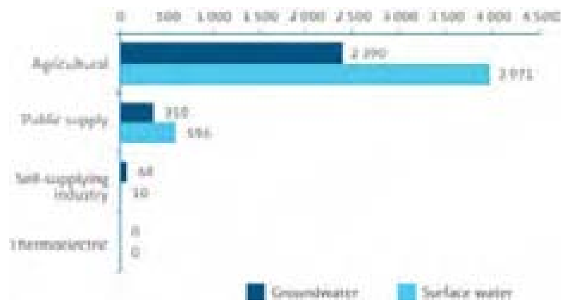
Offstream water uses, 2007



Agricultural	6 362	hm³/year	(82.6%)
Public supply	955	hm³/year	(12.9%)
Self-supplying industry	78	hm³/year	(1.1%)
Thermoelectric	0	hm³/year	(0.0%)
Total	7 394	hm³/year	(100.0%)

Origen of the water used, 2007

Surface water	4 577 hm³/year (61.9%)
Groundwater	2 817 hm³/year (38.1%)



Drinking water and sanitation, 2005

Drinking water coverage

State-wide	95.2	%
Urban	96.6	%
Rural	87.0	%

Sanitation coverage

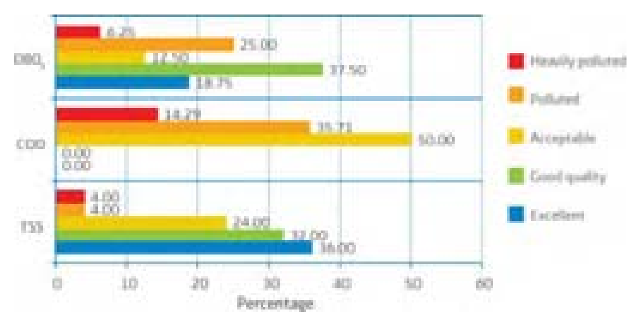
State-wide	85.4	%
Urban	92.3	%
Rural	44.3	%

Surface water quality, 2007

Number of water quality monitoring sites

BOD_5	16
COD	14
TSS	25

Percentage distribution of the monitoring sites by indicator and classification scale of water quality



Treatment plants (up to December 2007)

Municipal treatment plants

Number in operation	20	
Installed capacity	2.890	m^3/s
Flow treated	1.580	m^3/s

Municipal wastewater

Number in operation	66	
Installed capacity	4.19	m^3/s
Flow treated	3.00	m^3/s

Industrial wastewater

Number in operation	23	
Installed capacity	0.36	m^3/s
Flow treated	0.16	m^3/s

27. Tabasco

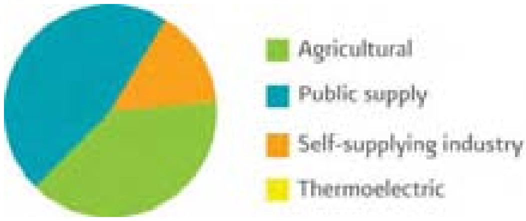
GENERAL DATA

2007 population (inhabitants)

Total	2 034 507	
Urban	1 120 726	
Rural	913 782	
Number of municipalities	17	
Population in 2030	2 168 004	inhabitants
Normal annual precipitation 1971-2000	2 102.0	mm

Location in Mexico

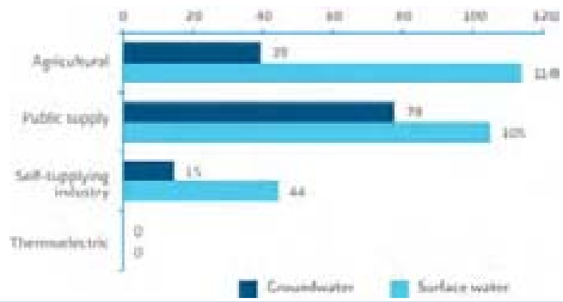
Offstream water uses, 2007



Agricultural	154	hm³/year	(38.8%)
Public supply	183	hm³/year	(46.2%)
Self-supplying industry	59	hm³/year	(14.9%)
Thermoelectric	0	hm³/year	(0.0%)
Total	395	hm³/year	(100.0%)

Origen of the water used, 2007

Surface water	264 hm³/year (66.7%)
Groundwater	132 hm³/year (33.3%)



Drinking water and sanitation, 2005

Drinking water coverage

State-wide	76.4	%
Urban	88.7	%
Rural	61.5	%

Sanitation coverage

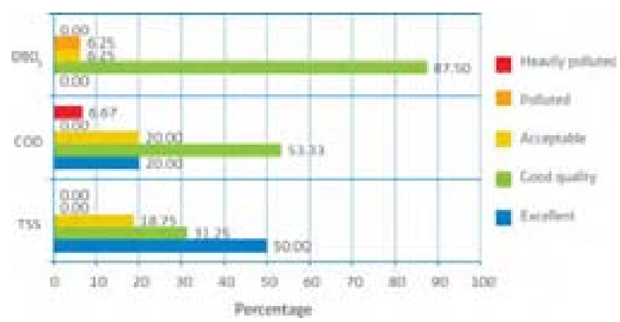
State-wide	93.4	%
Urban	97.8	%
Rural	88.1	%

Surface water quality, 2007

Number of water quality monitoring sites

BOD_5	16
COD	15
TSS	16

Percentage distribution of the monitoring sites by indicator and classification scale of water quality



Treatment plants (up to December 2007)

Municipal treatment plants

Number in operation	35	
Installed capacity	8.651	m^3/s
Flow treated	5.696	m^3/s

Municipal wastewater

Number in operation	70	
Installed capacity	1.81	m^3/s
Flow treated	1.32	m^3/s

Industrial wastewater

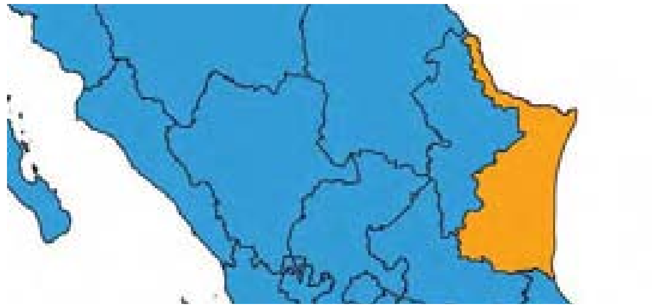
Number in operation	108	
Installed capacity	0.61	m^3/s
Flow treated	0.15	m^3/s

28. Tamaulipas

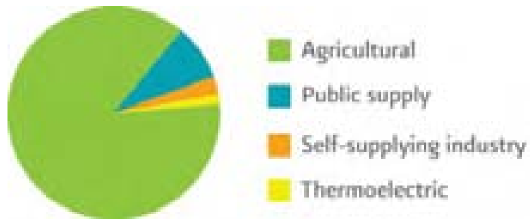
GENERAL DATA

2007 population (inhabitants)		
Total	3 135 501	
Urban	2 746 579	
Rural	388 922	
Number of municipalities	43	
Population in 2030	3 829 639	inhabitants
Normal annual precipitation 1971-2000	763.6	mm

Location in Mexico



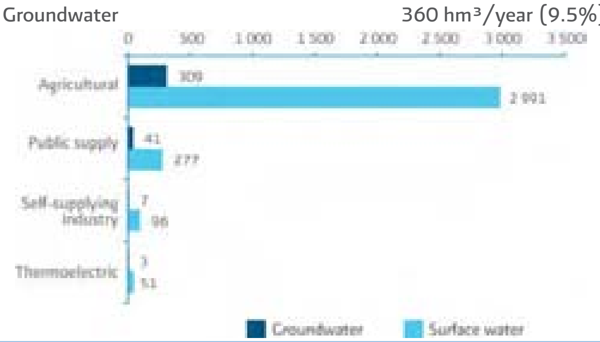
Offstream water uses, 2007



Agricultural	3 300	hm³/year	(87.4%)
Public supply	318	hm³/year	(8.4%)
Self-supplying industry	104	hm³/year	(2.7%)
Thermoelectric	54	hm³/year	(1.4%)
Total	3 776	hm³/year	(100.0%)

Origen of the water used, 2007

Surface water	3 415 hm³/year (90.5%)
Groundwater	360 hm³/year (9.5%)



Drinking water and sanitation, 2005

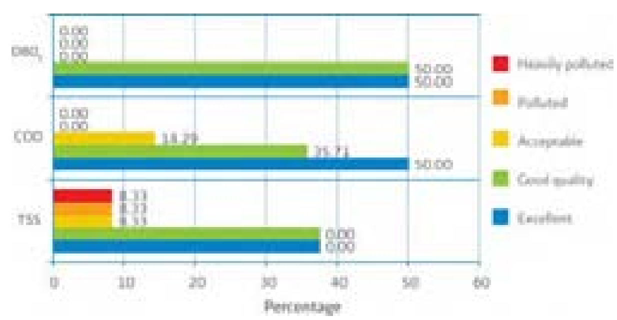
Drinking water coverage		
State-wide	94.7	%
Urban	97.8	%
Rural	74.3	%
Sanitation coverage		
State-wide	82.4	%
Urban	90.5	%
Rural	27.7	%

Surface water quality, 2007

Number of water quality monitoring sites

BOD_5	22
COD	28
TSS	24

Percentage distribution of the monitoring sites by indicator and classification scale of water quality



Treatment plants (up to December 2007)

Municipal treatment plants		
Number in operation	55	
Installed capacity	14 222	m^3/s
Flow treated	11 492	m^3/s
Municipal wastewater		
Number in operation	33	
Installed capacity	3.63	m^3/s
Flow treated	3.57	m^3/s
Industrial wastewater		
Number in operation	46	
Installed capacity	1.60	m^3/s
Flow treated	0.83	m^3/s

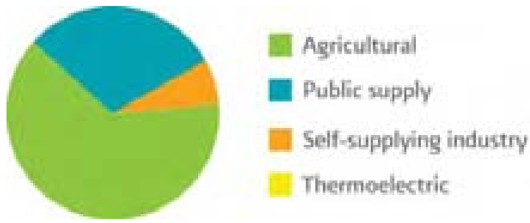
29. Tlaxcala

GENERAL DATA

2007 population (inhabitants)

Total	1 112 200	
Urban	874 844	
Rural	237 356	
Number of municipalities	60	
Population in 2030	1 408 991	inhabitants
Normal annual precipitation 1971-2000	700	mm

Offstream water uses, 2007



Agricultural	179	hm³/year	(63.1%)
Public supply	85	hm³/year	(30.1%)
Self-supplying industry	19	hm³/year	(6.8%)
Thermoelectric	0	hm³/year	(0.0%)
Total	284	hm³/year	(100.0%)

Drinking water and sanitation, 2005

Drinking water coverage

State-wide	97.3	%
Urban	97.9	%
Rural	95.3	%

Sanitation coverage

State-wide	90.6	%
Urban	92.8	%
Rural	82.8	%

Treatment plants (up to December 2007)

Municipal treatment plants

Number in operation	0	
Installed capacity	0.000	m^3/s
Flow treated	0.000	m^3/s

Municipal wastewater

Number in operation	52	
Installed capacity	1.23	m^3/s
Flow treated	0.87	m^3/s

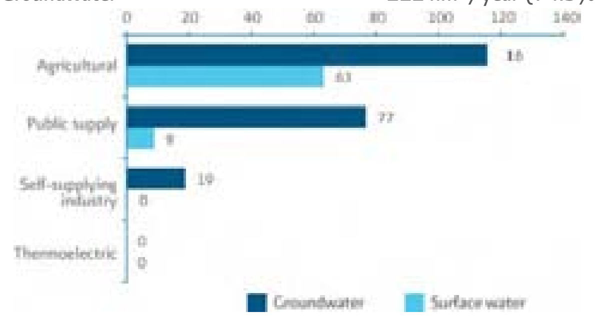
Industrial wastewater

Number in operation	107	
Installed capacity	0.30	m^3/s
Flow treated	0.26	m^3/s

Location in Mexico

Origen of the water used, 2007

Surface water	72 hm³/year (25.5%)
Groundwater	211 hm³/year (74.5%)

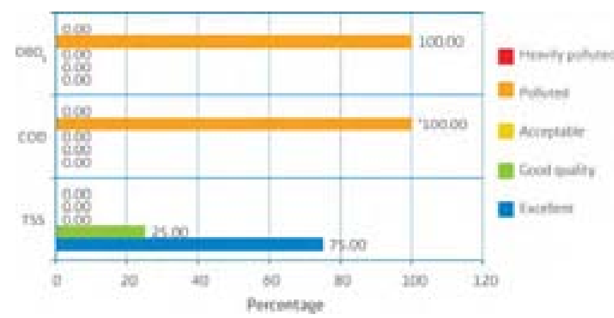


Surface water quality, 2007

Number of water quality monitoring sites

BOD_5	4
COD	4
TSS	4

Percentage distribution of the monitoring sites by indicator and classification scale of water quality



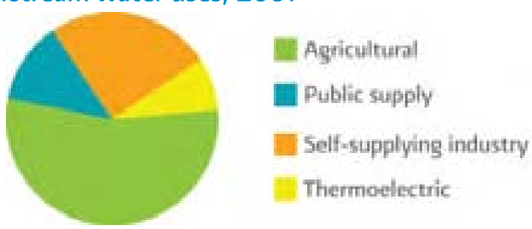
30. Veracruz de Ignacio de la Llave

GENERAL DATA

2007 population (inhabitants)

Total	7 251 626	
Urban	4 434 093	
Rural	2 817 533	
Number of municipalities	212	
Population in 2030	7 373 459	inhabitants
Normal annual precipitation 1971-2000	1610.6	mm

Offstream water uses, 2007



Agricultural	2 505	hm³/year	(54.5%)
Public supply	568	hm³/year	(12.4%)
Self-supplying industry	1 151	hm³/year	(25.1%)
Thermoelectric	368	hm³/year	(8.0%)
Total	4 592	hm³/year	(100.0%)

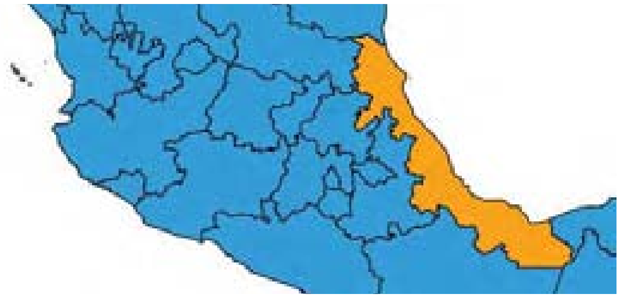
Drinking water and sanitation, 2005

Drinking water coverage		
State-wide	76.3	%
Urban	89.2	%
Rural	56.7	%
Sanitation coverage		
State-wide	77.7	%
Urban	93.3	%
Rural	54.0	%

Treatment plants (up to December 2007)

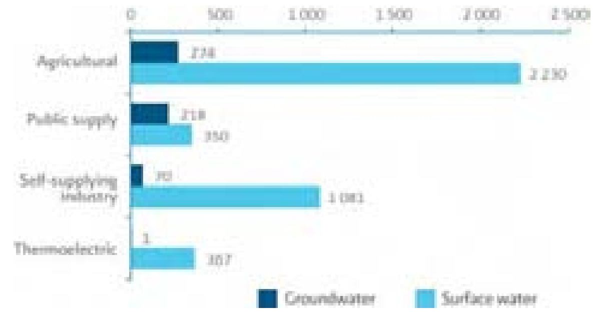
Municipal treatment plants		
Number in operation	8	
Installed capacity	6.600	m^3/s
Flow treated	4.760	m^3/s
Municipal wastewater		
Number in operation	87	
Installed capacity	4.68	m^3/s
Flow treated	2.65	m^3/s
Industrial wastewater		
Number in operation	160	
Installed capacity	11.63	m^3/s
Flow treated	8.64	m^3/s

Location in Mexico



Origen of the water used, 2007

Surface water	4 028 hm³/year (87.7%)
Groundwater	563 hm³/year (12.3%)

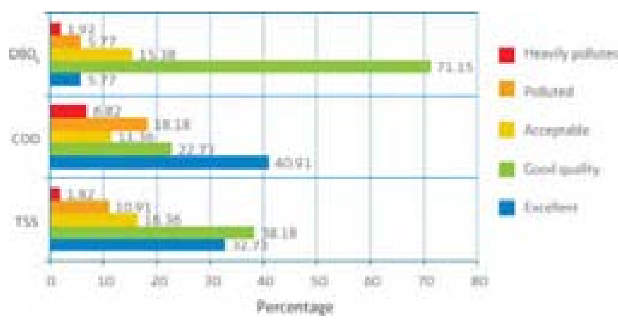


Surface water quality, 2007

Number of water quality monitoring sites

BOD_5	52
COD	44
TSS	55

Percentage distribution of the monitoring sites by indicator and classification scale of water quality



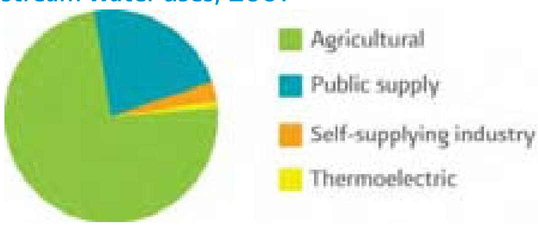
31. Yucatan

GENERAL DATA

2007 population (inhabitants)

Total	1 886 161	
Urban	1 565 456	
Rural	320 705	
Number of municipalities	106	
Population in 2030	2 391 751	inhabitants
Normal annual precipitation 1971-2000	1066.6	mm

Offstream water uses, 2007



Agricultural	814	hm³/year	(73.9%)
Public supply	245	hm³/year	(22.2%)
Self-supplying industry	34	hm³/year	(3.1%)
Thermoelectric	9	hm³/year	(0.9%)
Total	1 103	hm³/year	(100.0%)

Drinking water and sanitation, 2005

Drinking water coverage

State-wide	96.1	%
Urban	96.7	%
Rural	93.7	%

Sanitation coverage

State-wide	68.2	%
Urban	74.9	%
Rural	36.5	%

Treatment plants (up to December 2007)

Municipal treatment plants

Number in operation	0	
Installed capacity	0.000	m^3/s
Flow treated	0.000	m^3/s

Municipal wastewater

Number in operation	13	
Installed capacity	0.08	m^3/s
Flow treated	0.07	m^3/s

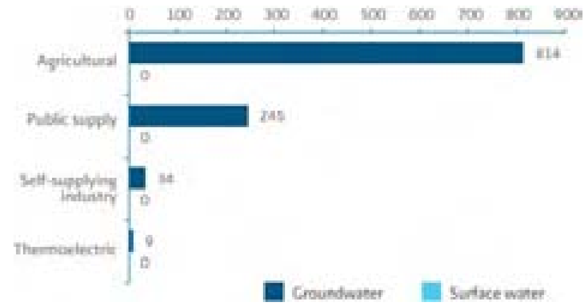
Industrial wastewater

Number in operation	36	
Installed capacity	0.11	m^3/s
Flow treated	0.07	m^3/s

Location in Mexico

Origen of the water used, 2007

Surface water	0 hm³/year (0.0%)
Groundwater	1 103 hm³/year (100.0%)



Surface water quality, 2007

Number of water quality monitoring sites

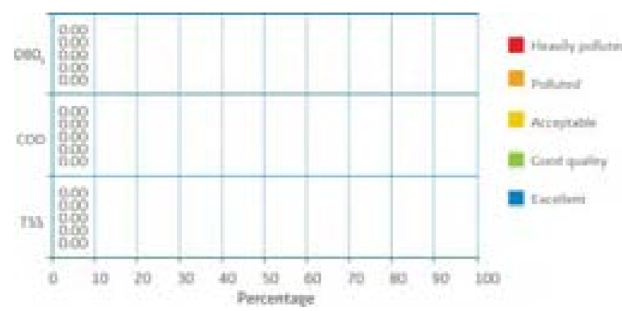
BOD_5

COD

TSS

Percentage distribution of the monitoring sites by indicator and classification scale of water quality

In this State, there in no relevant surface runoff.



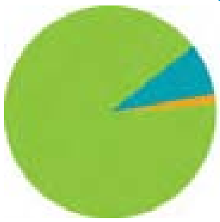
32. Zacatecas

GENERAL DATA

2007 population (inhabitants)

Total	1 381 991	
Urban	799 686	
Rural	582 306	
Number of municipalities	58	
Population in 2030	1 280 431	inhabitants
Normal annual precipitation 1971-2000	460.8	mm

Offstream water uses, 2007



Agricultural	1 295	hm³/year	(90.8%)
Public supply	112	hm³/year	(7.9%)
Self-supplying industry	19	hm³/year	(1.4%)
Thermoelectric	0	hm³/year	(0.0%)
Total	1 427	hm³/year	(100.0%)

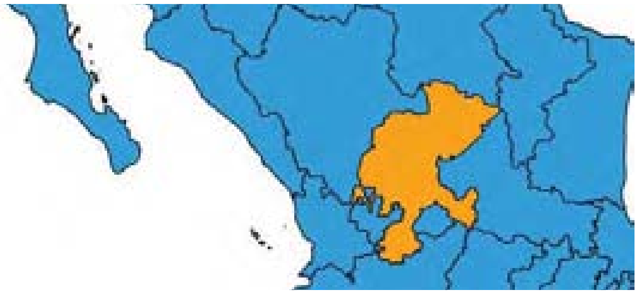
Drinking water and sanitation, 2005

Drinking water coverage		
State-wide	92.8	%
Urban	98.6	%
Rural	85.2	%
Sanitation coverage		
State-wide	84.2	%
Urban	96.1	%
Rural	68.4	%

Treatment plants (up to December 2007)

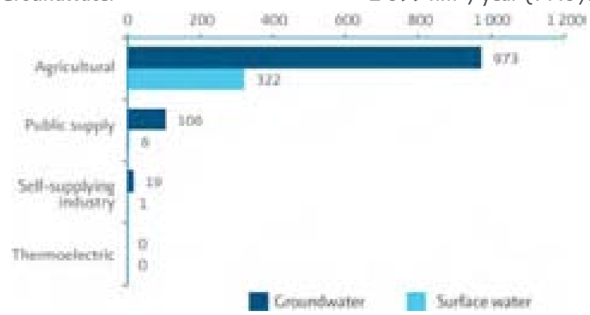
Municipal treatment plants		
Number in operation	25	
Installed capacity	0.005	m^3/s
Flow treated	0.005	m^3/s
Municipal wastewater		
Number in operation	35	
Installed capacity	0.48	m^3/s
Flow treated	0.42	m^3/s
Industrial wastewater		
Number in operation	7	
Installed capacity	0.15	m^3/s
Flow treated	0.04	m^3/s

Location in Mexico



Origen of the water used, 2007

Surface water	329 hm³/year (23.0%)
Groundwater	1 099 hm³/year (77.0%)

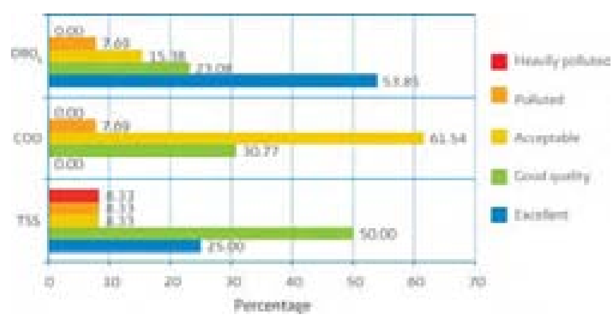


Surface water quality, 2007

Number of water quality monitoring sites

BOD_5	13
COD	13
TSS	12

Percentage distribution of the monitoring sites by indicator and classification scale of water quality



Annex C. Characteristics of the hydrological regions

In the following table a series of characteristics of Mexico's 37 hydrological regions is shown.

Hydrological region	Continental land extension (km^2)	Normal annual precipitation 1971-2000 (mm)	Mean natural internal surface runoff (hm^3/year)	Imports (+) or exports (-) from other countries (hm^3/year)	Total mean natural surface runoff (hm^3/year)	Number of watersheds
1. Baja California Northwest	28 492	249.4	359		359	16
2. Baja California Central-West	44 314	100.9	449		449	16
3. Baja California Southwest	29 722	184.7	318		318	15
4. Baja California Northeast	14 418	180.7	105		105	8
5. Baja California Central-East	13 626	100.5	54		54	15
6. Baja California Southeast	11 558	284.7	219		219	14
7. Colorado River	6 911	100.3	13	1 850	1 863	1
8. Sonora North	61 429	301.2	139		139	5
9. Sonora South	139 370	507.2	4 935		4 935	16
10. Sinaloa	103 483	715.9	14 408		14 408	23
11. Presidio-San Pedro[a]	51 717	815.2	7 956		7 956	23
12. Lerma-Santiago	132 916	723.2	13 637		13 637	58
13. River Huicicila[a]	5 225	1 396.2	1 277		1 277	6
14. River Ameca[a]	12 255	1 022.7	2 236		2 236	9
15. Jalisco Coast	12 967	1 185.5	3 684		3 684	11
16. Armeria-Coahuayana[a]	17 628	911.3	3 882		3 882	10
17. Michoacan Coast[a]	9 205	890.9	1 635		1 635	6
18. Balsas	118 268	949.7	17 057		17 057	15
19. Greater Guerrero Coast	12 132	1 232.0	6 091		6 091	28
20. Lower Guerrero Coast	39 936	1 393.1	18 714		18 714	32
21. Oaxaca Coast	10 514	971.2	3 389		3 389	19
22. Tehuantepec	16 363	824.9	2 606		2 606	15
23. Chiapas Coast	12 293	2 352.7	9 604	2 950	12 554	25
24. Bravo-Conchos	229 740	448.5	5 588	- 432	5 156	37
25. San Fernando-Soto La Marina	54 961	758.5	4 328		4 328	45
26. Panuco	96 989	889.2	20 329		20 329	77
27. North of Veracruz	26 592	1 423.2	14 306		14 306	12
28. Papaloapan	57 355	1 447.1	49 951		49 951	18
29. Coatzacoalcos	30 217	1 953.8	39 482		39 482	15
30. Grijalva-Usumacinta	102 465	1 708.9	73 466	44 080	117 546	83
31. Yucatan West	25 443	1 227.4	591		591	2
32. Yucatan North	58 135	1 092.4	0		0	0

(continues)

(continued)

Hydrological region	Continental land extension (km²)	Normal annual precipitation 1971-2000 (mm)	Mean natural internal surface runoff (hm³/year)	Imports (+) or exports (-) from other countries (hm³/year)	Total mean natural surface runoff (hm³/year)	Number of watersheds
33. Yucatan East	38 308	1 239.8	1 125	864	1 989	1
34. Closed Catchments of the North	90 829	407.8	1 701		1 701	22
35. Mapimi[a]	62 639	355.7	957		957	6
36. Nazas-Aguanaval[a]	93 032	422.1	1 912		1 912	16
37. El Salado[a]	87 801	428.2	2 637		2 637	8
Total	**1 959 248**	**759.6**	**329 137**	**49 312**	**378 449**	**728**

NOTE: This information refers to the mean data determined through the latest Studies carried out.
[a] In these regions, the availability studies have not yet been concluded.
SOURCE: CONAGUA. Deputy Director General's Office for Technical Affairs.

Annex D. List of overexploited aquifers

In the following table, Mexico's aquifers in a state of overexploitation are listed, up to December 31st, 2007.

No.	Hydrological-Administrative Region		Code of the aquifer	Hydrogeological unit (aquifer)	Withdrawal / recharge ratio
1	I	Baja California Peninsula	0208	Ojos Negros	1.34
2	I	Baja California Peninsula	0210	Mexicali Valley	1.16
3	I	Baja California Peninsula	0212	Maneadero	1.47
4	I	Baja California Peninsula	0221	San Quintin	1.28
5	I	Baja California Peninsula	0246	San Simon	1.66
6	I	Baja California Peninsula	0306	Santo Domingo	1.67
7	I	Baja California Peninsula	0323	Los Planes	1.17
8	II	Northwest	2601	San Luis Colorado River Valley	1.53
9	II	Northwest	2603	Sonoyta-Puerto Peñasco	1.12
10	II	Northwest	2605	Caborca	1.26
11	II	Northwest	2606	Los Chirriones	1.81
12	II	Northwest	2609	Busani	1.29
13	II	Northwest	2619	Hermosillo Coast	1.72
14	II	Northwest	2620	Sahuaral	1.16
15	II	Northwest	2621	Mesa del Seri-La Victoria	1.64
16	II	Northwest	2624	River Sonora	1.12
17	II	Northwest	2626	River Zanjon	1.22
18	II	Northwest	2627	River Bacoachi	1.25
19	II	Northwest	2635	Guaymas Valley	1.17

(continues)

(continued)

No.	Hydrological-Administrative Region		Code of the aquifer	Hydrogeological unit (aquifer)	Withdrawal / recharge ratio
20	II	Northwest	2636	San Jose de Guaymas	1.80
21	III	Northern Pacific	1001	Santiaguillo	1.18
22	III	Northern Pacific	1003	Guadiana Valley	1.11
23	IV	Balsas	1704	Tepalcingo-Axochiapan	1.52
24	IV	Balsas	2101	Tecamachalco Valley	1.78
25	VI	Rio Bravo	0507	Monclova	3.60
26	VI	Rio Bravo	0510	Saltillo-Ramos Arizpe	1.27
27	VI	Rio Bravo	0511	Manzanera-Zapaliname Region	1.26
28	VI	Rio Bravo	0801	Ascension	1.45
29	VI	Rio Bravo	0803	Baja Babicora	1.48
30	VI	Rio Bravo	0804	Buenaventura	1.56
31	VI	Rio Bravo	0805	Cuauhtemoc	1.66
32	VI	Rio Bravo	0806	Casas Grandes	1.11
33	VI	Rio Bravo	0807	El Sauz-Encinillas	1.11
34	VI	Rio Bravo	0821	Flores Magon-Villa Ahumada	1.13
35	VI	Rio Bravo	0830	Chihuahua-Sacramento	1.90
36	VI	Rio Bravo	0831	Meoqui-Delicias	1.56
37	VI	Rio Bravo	0832	Jimenez-Camargo	1.43
38	VI	Rio Bravo	0835	Tabaloapa-Aldama	1.19
39	VI	Rio Bravo	1908	Campo Mina	1.47
40	VII	Central Basins of the North	0509	La Paila	2.79
41	VII	Central Basins of the North	0523	Principal-Lagunera Region	1.79
42	VII	Central Basins of the North	1023	Ceballos	1.65
43	VII	Central Basins of the North	1024	Oriente Aguanaval	1.29
44	VII	Central Basins of the North	1026	Vicente Suarez	4.85
45	VII	Central Basins of the North	1916	Navidad-Potosi-Raices	1.47
46	VII	Central Basins of the North	2401	Vanegas-Catorce	1.29
47	VII	Central Basins of the North	2402	El Barril	1.68
48	VII	Central Basins of the North	2403	Salinas de Hidalgo	1.52
49	VII	Central Basins of the North	2407	Cedral-Matehuala	1.24
50	VII	Central Basins of the North	2408	Villa de Arista	1.55
51	VII	Central Basins of the North	2409	Villa Hidalgo	1.30
52	VII	Central Basins of the North	2411	San Luis Potosi	1.45
53	VII	Central Basins of the North	2412	Jaral de Berrios-Villa de Reyes	1.61
54	VII	Central Basins of the North	2413	Matehuala-Huizache	1.17
55	VII	Central Basins of the North	3210	Benito Juarez	1.14
56	VII	Central Basins of the North	3214	Aguanaval	1.19
57	VII	Central Basins of the North	3215	Abrego	1.11
58	VII	Central Basins of the North	3223	Guadalupe de las Corrientes	2.72
59	VII	Central Basins of the North	3224	Puerto Madero	2.08

(continues)

(continued)

No.	Hydrological-Administrative Region		Code of the aquifer	Hydrogeological unit (aquifer)	Withdrawal / recharge ratio
60	VII	Central Basins of the North	3225	Calera	1.49
61	VII	Central Basins of the North	3226	Chupaderos	1.90
62	VII	Central Basins of the North	3228	La Blanca	1.44
63	VII	Central Basins of the North	3229	Loreto	1.55
64	VIII	Lerma-Santiago-Pacific	0101	Aguascalientes Valley	1.83
65	VIII	Lerma-Santiago-Pacific	0102	Chicalote Valley	1.37
66	VIII	Lerma-Santiago-Pacific	0103	El Llano	1.60
67	VIII	Lerma-Santiago-Pacific	0104	Venadero	1.16
68	VIII	Lerma-Santiago-Pacific	0105	Calvillo Valley	1.60
69	VIII	Lerma-Santiago-Pacific	0614	Ixtlahuacan Valley	1.33
70	VIII	Lerma-Santiago-Pacific	1104	Dry Lagoon	3.10
71	VIII	Lerma-Santiago-Pacific	1106	Dr. Mora-San Jose Iturbide	1.81
72	VIII	Lerma-Santiago-Pacific	1107	San Miguel de Allende	1.78
73	VIII	Lerma-Santiago-Pacific	1108	Upper River Laja Basin	2.95
74	VIII	Lerma-Santiago-Pacific	1110	Silao-Romita	1.50
75	VIII	Lerma-Santiago-Pacific	1111	La Muralla	1.10
76	VIII	Lerma-Santiago-Pacific	1113	Leon Valley	1.31
77	VIII	Lerma-Santiago-Pacific	1114	River Turbio	1.35
78	VIII	Lerma-Santiago-Pacific	1115	Celaya Valley	2.07
79	VIII	Lerma-Santiago-Pacific	1116	Valley of the Cuevita	1.44
80	VIII	Lerma-Santiago-Pacific	1117	Acambaro Valley	1.19
81	VIII	Lerma-Santiago-Pacific	1118	Salvatierra-Acambaro	1.33
82	VIII	Lerma-Santiago-Pacific	1119	Irapuato-Valle	1.12
83	VIII	Lerma-Santiago-Pacific	1120	Penjamo-Abasolo	1.96
84	VIII	Lerma-Santiago-Pacific	1122	Prieta-Moroleon Marsh	1.68
85	VIII	Lerma-Santiago-Pacific	1408	La Barca	1.26
86	VIII	Lerma-Santiago-Pacific	1422	Encarnacion	1.15
87	VIII	Lerma-Santiago-Pacific	1501	Toluca Valley	1.25
88	VIII	Lerma-Santiago-Pacific	1502	Ixtlahuaca-Atlacomulco	1.75
89	VIII	Lerma-Santiago-Pacific	1602	Morelia-Querendaro	1.41
90	VIII	Lerma-Santiago-Pacific	1605	Pastor Ortiz-La Piedad	1.19
91	VIII	Lerma-Santiago-Pacific	1609	Briseñas-Yurecuaro	1.27
92	VIII	Lerma-Santiago-Pacific	2201	Queretaro Valley	1.57
93	VIII	Lerma-Santiago-Pacific	2202	Amazcala Valley	1.18
94	VIII	Lerma-Santiago-Pacific	3211	Villanueva	1.28
95	VIII	Lerma-Santiago-Pacific	3212	Ojocaliente	1.41
96	IX	Northern Gulf	1317	Tulancingo Valley	2.85
97	IX	Northern Gulf	2203	San Juan del Rio Valley	1.48
98	XIII	Waters of the Valley of Mexico	0901	Metropolitan Zone of Mexico City	1.82
99	XIII	Waters of the Valley of Mexico	1506	Chalco-Amecameca	1.73
100	XIII	Waters of the Valley of Mexico	1507	Texcoco	9.58
101	XIII	Waters of the Valley of Mexico	1508	Cuautitlan-Pachuca	2.38

SOURCE: CONAGUA. Deputy Director General's Office for Technical Affairs.

Annex E. Characteristics of the Technical Groundwater Committees (COTAS)

In the following table, information is presented on the 78 Technical Groundwater Committees (COTAS) established nationwide, up to December 31st, 2007. From January to June 2008, no additional COTAS was set up.

No.	Code	COTAS	Date of establishment	State	Hydrological-Administrative Region	
1	0101	Comondu Technical Groundwater Committee (Formerly Santo Domingo Valley)	Apr 23rd, 98	Baja California Sur	I	Baja California Peninsula
2	0102	Los Planes Valley	Apr 24th, 98	Baja California Sur	I	Baja California Peninsula
3	0103	La Paz-Carrizal Aquifer Technical Groundwater Committee	Jul 07th, 98	Baja California Sur	I	Baja California Peninsula
4	0104	San Jose del Cabo	Oct 21st, 98	Baja California Sur	I	Baja California Peninsula
5	0105	Vizcaino Valley	Mar 18th, 99	Baja California Sur	I	Baja California Peninsula
6	0106	Todos Santos-El Pescadero Valley	Mar 30th, 00	Baja California Sur	I	Baja California Peninsula
7	0107	Mulege Valley	Nov 29th, 01	Baja California Sur	I	Baja California Peninsula
8	0201	Camalu Aquifer	May 06th, 99	Baja California	I	Baja California Peninsula
9	0202	Colonia Vicente Guerrero Aquifer	May 06th,99	Baja California	I	Baja California Peninsula
10	0203	San Quintin Aquifer	May 06th, 99	Baja California	I	Baja California Peninsula
11	0204	San Simon Aquifer	May 06th, 99	Baja California	I	Baja California Peninsula
12	0205	San Rafael COTAS	Aug 11th, 99	Baja California	I	Baja California Peninsula
13	0206	San Telmo Aquifer	Aug 11th, 99	Baja California	I	Baja California Peninsula
14	0207	San Vicente Aquifer COTAS	Aug 11th, 99	Baja California	I	Baja California Peninsula
15	0208	Santo Tomas Aquifer	Aug 11th, 99	Baja California	I	Baja California Peninsula
16	0209	Technical Groundwater Committee of the Maneadero Aquifer	Oct 28th, 99	Baja California	I	Baja California Peninsula
17	0210	Technical Groundwater Committee of the Guadalupe Valley	Oct 28th, 99	Baja California	I	Baja California Peninsula
18	0211	Technical Groundwater Committee of the Ojos Negros Aquifer	Feb 07th, 03	Baja California	I	Baja California Peninsula
19	0212	Trinidad Valley Water Technical Committee	Feb 07th, 03	Baja California	I	Baja California Peninsula
Baja California Peninsula subtotal: 19 COTAS established						
20	0301	Zanjon Aquifer Technical Groundwater Committee	Apr 05th, 01	Sonora	II	Northwest
21	0302	San Miguel River Aquifer	Jun 03rd, 01	Sonora	II	Northwest
22	0303	Technical Groundwater Committee of the Mesa del Seri-La Victoria Aquifer	Jun 22nd, 01	Sonora	II	Northwest
23	0401	Guerrero Yepomera Technical Groundwater Committee	May 26th, 06	Chihuahua	II	Northwest
24	0402	Technical Groundwater Committee of the San Jose de Guaymas Aquifer	Aug 10th, 07	Sonora	II	Northwest
Northwest subtotal: 5 COTAS established						
25	0801	Aquifer Vicente Guerrero-Poanas Technical Groundwater Committee	Apr 04th, 03	Durango	III	Northern Pacific
26	0802	Canatlan Valley Aquifer Technical Groundwater Committee	Apr 29th, 03	Durango	III	Northern Pacific
27	0803	Guadiana Valley Aquifer Technical Groundwater Committee	Oct 14th, 03	Durango	III	Northern Pacific
28	0804	Aquifer 1005 Madero Victoria Technical Groundwater Committee	Jan 14th, 05	Durango	III	Northern Pacific

(continues)

(continued)

No.	Code	COTAS	Date of establishment	State	Hydrological-Administrative Region	
29	0805	Santiaguillo Valley Technical Groundwater Committee	Jan 18th, 05	Durango	III	Northern Pacific
Northern Pacific subtotal: 5 COTAS established						
30	0901	Tecamachalco Aquifer Technical Groundwater Committee	Jun 01st, 01	Puebla	IV	Balsas
31	0902	Huamantla-Libres-Oriental-Perote Aquifer Technical Groundwater Committee	Jul 06th, 01	Tlaxcala-Puebla-Veracruz	IV	Balsas
32	0903	Technical Water Committee of the Alto Atoyac Aquifer	Nov 07th, 01	Puebla and Tlaxcala	IV	Balsas
Balsas subtotal: 3 COTAS established						
33	1101	Central Valley Technical Groundwater Committee (Formerly Zimatlan Valley)	Jul 04th, 02	Oaxaca	V	Southern Pacific
Southern Pacific subtotal: 1 COTAS established						
34	1201	Jimenez-Camargo Aquifer Technical Groundwater Committee	Dec 05th, 01	Chihuahua	VI	Rio Bravo
35	1202	Cuauhtemoc Aquifer Technical Groundwater Committee, Chihuahua	Aug 30th, 02	Chihuahua	VI	Rio Bravo
36	1203	Ascension Aquifer Technical Groundwater Committee, Chihuahua	Sep 30th, 02	Chihuahua	VI	Rio Bravo
37	1204	Casas Grandes Aquifer Technical Groundwater Committee, Chihuahua	Nov 08th, 02	Chihuahua	VI	Rio Bravo
38	1205	Janos Aquifer Technical Groundwater Committee	Nov 15th, 02	Chihuahua	VI	Rio Bravo
39	1206	Cañon del Derramadero Aquifer Technical Groundwater Committee	May 30th, 02	Coahuila de Zaragoza	VI	Rio Bravo
40	1207	Buenaventura Aquifer Technical Groundwater Committee	Dec 05th, 03	Chihuahua	VI	Rio Bravo
41	1208	Baja Babicora Aquifer Technical Groundwater Committee	Dec 06th, 03	Chihuahua	VI	Rio Bravo
42	1209	Tarabillas Valley Aquifer Technical Groundwater Committee	Dec 03rd, 03	Chihuahua	VI	Rio Bravo
43	1210	Cuatrocienega-Ocampo Aquifer Technical Groundwater Committee	Mar 28th, 07	Coahuila de Zaragoza	VI	Rio Bravo
Rio Bravo subtotal: 10 COTAS established						
44	1301	Technical Groundwater Committee of the Main Aquifer of the Comarca Lagunera	Sep 05th, 00	Coahuila de Zaragoza - Durango	VII	Central Basins of the North
45	1302	Aguanaval Aquifer Technical Groundwater Committee	Nov 24th, 00	Zacatecas	VII	Central Basins of the North
46	1303	Cepeda-Sauceda General Aquifer	May 30th, 02	Coahuila de Zaragoza - Durango	VII	Central Basins of the North
47	1401	Cedral-Matehuala Aquifer Technical Groundwater Committee	Sep 20th, 00	San Luis Potosi	VII	Central Basins of the North
48	1402	El Barril Aquifer Technical Groundwater Committee, in the State of San Luis Potosi	Sep 20th, 00	San Luis Potosi	VII	Central Basins of the North
49	1403	San Luis Potosi Valley Aquifer Technical Groundwater Committee	Sep 20th,00	San Luis Potosi	VII	Central Basins of the North
50	1404	Arista Valley Aquifer Technical Water Committee	Sep 20th,00	San Luis Potosi	VII	Central Basins of the North
51	1405	Calera Aquifer Technical Groundwater Committee	Nov 24th, 00	Zacatecas	VII	Central Basins of the North
52	1406	Chupaderos Aquifer Technical Groundwater Committee	Nov 24th, 00	Zacatecas and San Luis Potosi	VII	Central Basins of the North
Central Basins of the North subtotal: 9 COTAS established						

(continues)

(continued)

No.	Code	COTAS	Date of establishment	State	Hydrological-Administrative Region	
53	1501	Celaya Technical Water Council	Nov 28th, 97	Guanajuato	VIII	Lerma-Santiago-Pacific
54	1502	Dry Lagoon Technical Water Council	Nov 28th, 97	Guanajuato	VIII	Lerma-Santiago-Pacific
55	1503	Queretaro Valley Aquifer Technical Groundwater Committee	Feb 20th, 98	Queretaro Arteaga	VIII	Lerma-Santiago-Pacific
56	1504	Amazcala Aquifer Technical Groundwater Committee	Sep 25th, 98	Queretaro Arteaga	VIII	Lerma-Santiago-Pacific
57	1505	Leon Technical Water Council	Oct 01st, 98	Guanajuato	VIII	Lerma-Santiago-Pacific
58	1506	Silao-Romita Technical Water Council	Oct 01st, 98	Guanajuato	VIII	Lerma-Santiago-Pacific
59	1507	Irapuato-Santiago Valley Technical Water Council	Nov 06th, 98	Guanajuato	VIII	Lerma-Santiago-Pacific
60	1508	Penjamo-Abasolo Technical Water Council	Nov 06th, 98	Guanajuato	VIII	Lerma-Santiago-Pacific
61	1509	Huimilpan Aquifer Technical Groundwater Committee	Dec 10th, 98	Queretaro Arteaga	VIII	Lerma-Santiago-Pacific
62	1510	Salvatierra-La Cuevita Technical Water Council	Jan 07th, 99	Guanajuato	VIII	Lerma-Santiago-Pacific
63	1511	River Turbio Technical Water Council	Jun 01st, 99	Guanajuato	VIII	Lerma-Santiago-Pacific
64	1512	Acambaro-Cuitzeo Technical Water Council	Aug 25th, 99	Guanajuato	VIII	Lerma-Santiago-Pacific
65	1513	Moroleon-Cienega Prieta Technical Water Council	Aug 31st, 99	Guanajuato	VIII	Lerma-Santiago-Pacific
66	1514	River Laja Technical Groundwater Council	Oct 01st, 99	Guanajuato	VIII	Lerma-Santiago-Pacific
67	1515	Toluca Valley Aquifer Technical Groundwater Committee	Jul 30th, 03	State of Mexico	VIII	Lerma-Santiago-Pacific
68	1601	Ojocaliente Interstate Aguascalientes Encarnacion Groundwater Committee Aquifer	Apr 18th, 00	Aguascalientes-Jalisco-Zacatecas	VIII	Lerma-Santiago-Pacific
69	1602	Ocampo Technical Groundwater Council	Feb 17th, 06	Guanajuato	VIII	Lerma-Santiago-Pacific
Lerma-Santiago-Pacific subtotal: 17 COTAS established						
70	1901	Jaral de Berrios-Villa de Reyes Interstate Aquifer Technical Water Committee	Nov 23th, 99	Guanajuato- San Luis Potosi	IX	Northern Gulf
71	1902	Huichapan-Tecozautla-Nopala Aquifer Technical Groundwater Committee	Sep 12th, 00	Hidalgo	IX	Northern Gulf
72	1903	Tulancingo Valley Aquifer Technical Groundwater Committee	Jul 25th, 02	Hidalgo	IX	Northern Gulf
73	1904	Rioverde Aquifer Technical Groundwater Committee	Oct 08th, 04	San Luis Potosi	IX	Northern Gulf
74	1905	Valle de San Juan del Rio Aquifer Technical Groundwater Committee	Oct 21st,04	Queretaro Arteaga	IX	Northern Gulf
75	1906	Sierra Gorda Technical Water Council	Oct 14th, 05	Guanajuato	IX	Northern Gulf
Northern Gulf subtotal: 6 COTAS established						
76	2101	Tehuacan Valley Aquifer Technical Groundwater Committee	Jul 17th, 01	Puebla	X	Central Gulf
77	2102	Los Naranjos Aquifer Technical Groundwater Committee	Jun 23th, 06	Veracruz de Ignacio de la Llave	X	Central Gulf
Central Gulf subtotal: 2 COTAS established						
78	2601	Cuautitlan-Pachuca Aquifer Technical Groundwater Committee	Nov 24th, 06	State of Mexico, Hidalgo	XIII	Waters of the Valley of Mexico
Valley of Mexico subtotal: 1 COTAS established						
Total: 78 COTAS established						

SOURCE: CONAGUA. General Coordination for Attention to Emergencies and River Basin Councils.

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Annex G. Glossary

Agricultural use	For the purpose of this document, this concept includes the agricultural use, for livestock and aquaculture, according to the definitions of the National Water Law.
Aquifer	Any geological formation or group of hydraulically connected geological formations, through which subsoil waters flow or are stored that may be withdrawn for use and whose lateral and vertical limits are conventionally defined for the purpose of evaluation, management and administration of the nation's subsoil waters. NWL.- Article 3 Section II. The country has been divided into 653 aquifers of hydrogeological units.
Blue water	The quantity of water withdrawn from the country's rivers, lakes, streams and aquifers for various uses, both offstream and instream.
Catchment / River basin ("cuenca hidrografica")	A natural unit defined by the existence of a division of waters in any given territory. Catchments are morphological surface units. Their limits are established by the main geographical division of the waters from precipitation; also known as "water-divide". Their limits are established by the main geographical division of rainwater, also known as the "water-divide". The water-divide, theoretically, is an imaginary line that unites the highest relative points between two adjacent but opposite facing slopes; from the highest part of the catchment to its exit point, in the hypsometrically lowest point. In Mexico, 1 471 catchments have been identified (INEGI-INECONAGUA. Map of Mexico's Catchments scale 1:250 000. Digital Cartography). Throughout this document, the terms "catchment" and "river basin" are used as synonyms, to translate the Spanish term "cuenca hidrografica".
Climate station	A given area of open-air ground, representative of the area's particular climate, intended to measure the climatological parameters. Equipped with tools and sensors exposed to the air, for the measurement of precipitation, temperature, evaporation, wind direction and speed.
Concession	A deed granted by the Federal Executive Branch, through the CONAGUA or the corresponding River Basin Organization, according to their respective areas of competence, in order to carry out the use of the nation's waters, and of their inherent state property, to public and private individuals or organizations, except for allocation deeds. NWL.- Article 3 Section XIII.
Discharge	The action of pouring, infiltrating, depositing or infusing wastewater into a receiver body. NWL.- Article 3 Section XXII.
Discharge permits	Deeds granted by the Federal Executive Branch through the CONAGUA or the corresponding River Basin Organization, in accordance with their respective areas of competence, for the discharge of wastewater into national receiver bodies, granted to private or public individuals or organizations. NWL.- Article 3 Section XL b.
Drinking water coverage	Percentage of the population living in private homes who have running water within the home or on the lot or who have access to a public water tap or hydrant. This information is determined by means of censuses conducted by the INEGI and estimates from the CONAGUA for intermediate years.
Drinking Water and Sanitation System	A series of works and actions that allow the provision of public drinking water and sanitation services, including sewerage, meaning the piping, treatment, removal and discharge of wastewater. NWL.- Article 3 Section L.
Environmental Services	The benefits of social interest generated 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 catchment, water body purification, as well as the conservation and protection of biodiversity. For the application of this concept in the 2004 National Water Law, water resources and their link with forest resources are mainly considered. NWL.- Article 3 Section XLIX.
Exploitation	Application of water for activities with the aim of withdrawing dissolved chemical or organic elements from it, after which it is returned to its original source without significant consumption.
Green water	The quantity of water that is part of the soil humidity and that is used for rainfed crops and general vegetation.
Groundwater	Water that completely permeates the leeks or cracks in the subsoil. It is therefore the water that constitutes the permeated zone.
Hydrological-Administrative Region	A territorial area defined according to hydrological criteria, made up of one or several hydrological regions, in which the watershed is considered as the basic unit for water resources management and the municipality represents, as is the case in other legal tools, the minimal administrative unit for the country. NWL.- Article 3 Section XVI b.
Hydrological region	A territorial area comprised according to its morphological, orographical and hydrological features, in which the watershed is considered as the basic unit for water management, the aim of which is to group together and systematize the information, analysis, diagnosis, programs and actions as regards the occurrence of water in quantity and quality, as well as its use. A hydrological region is normally made up of one or several watersheds. The limits of the hydrological region are therefore in general different from the political division by States, Federal District and municipalities. One or several hydrological regions make up a Hydrological-Administrative Region. NWL.- Article 3 Section XVIA.

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Irrigation area	An area entitled to irrigation services.
Irrigation Districts	Geographical areas where irrigation services are provided by means of hydro-agricultural infrastructure works such as reservoirs, direct diversions, pumping plants, wells, canals, and paths, among others.
Irrigation lamina	The quantity of water, measured in longitudinal units, that is applied to a crop growth so that it may meet its physiological needs during the entire growth cycle, in addition to soil evaporation (offstream use = evaporation + water in plant tissues).
Irrigation Unit	An agricultural area with irrigation infrastructure and systems, different from an irrigation district and commonly of a lesser area than the latter; it may be made up of user associations or other organized groups of producers who are freely gathered together to provide irrigation services with autonomous management systems and to operate the hydraulic infrastructure works to catch, divert, pipe, regulate, distribute and remove the nation's waters destined for agricultural irrigation. NWL.- Article 3 Section LI.
Lake, lagoon or marsh vessel	The natural tank of the nation's waters bordered by the crest of the maximum ordinary crescent. NWL.- Article 3 Section LXI.
Large dams	Dams whose height above the riverbed is greater than 15 m or which have a height of between 10 and 15 m, with a crest length of over 500 m or when the capacity of the reservoir formed by the dam is not less than 1 million cubic meters of maximum extraordinary water. Definition from the International Commission on Large Dams (ICOLD).
Locality	A place occupied by one or more homes, which may or may not be occupied; this place is recognized either by law or custom. According to their characteristics and for statistical purposes, they are classified as either urban or rural.
Main tailing dam	One of the systems for the final disposal of solid waste generated through minerals, which should comply with conditions of maximum security, in order to guarantee the protection of the population, economic and social activities, and in general, the ecological balance.
Marsh	Low marshy ground, that is usually filled by rainwater or overflows from a stream, a nearby lagoon or the sea. NWL.- Article 3 Section XXVI.
Mean annual groundwater availability	The annual mean volume of groundwater that can be allocated to be withdrawn from a hydrogeological unit or aquifer for various uses, in addition to the withdrawal already allocated and to the natural committed discharge, without placing the balance of the ecosystem in danger. NWL.- Article 3 Section XXIV.
Mean annual precipitation	The precipitation calculated over any period of at least ten years, starting on January 1st of the first year and ending on December 31st of the final one.
Mean annual surface water availability	The difference calculated between the annual mean volume of downstream runoff of a basin or watershed and the current annual mean committed volume downstream. NWL.- Article 3 Section XXIII.
Mean aquifer recharge	The annual mean water volume that enters an aquifer.
Mean natural availability	Total volume of renewable surface water and groundwater that naturally occurs in a region.
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 of open-air ground, intended to measure the surface meteorological parameters. Equipped with tools to measure precipitation, temperature, wind direction and speed, relative humidity, atmospheric pressure and solar radiation.
Nation's waters	Waters 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. NWL.- Article 3 Section I.
Normal precipitation	The precipitation measured for a uniform and relatively long period, which must contain at least 30 years of information, which is considered as a minimal representative climatological period. It must start on January 1st of a year ending in one and finishing on December 31st of a year ending in zero.
Offstream use	The volume of water of a specific quality consumed when carrying out a given activity, which is determined as the difference between the volume of a specific quality that is withdrawn, minus the volume also of specific quality that is discharged, which is indicated in the respective deed. NWL.- Article 3 Section LV.

Annex G. Glossary

Overexploited aquifer	Any aquifer in which the groundwater withdrawal is greater than the volume of mean annual recharge, in such a way that the persistence of this condition for long periods of time brings about one or several of the following environmental impacts: exhaustion or disappearance of springs, lakes, wetlands; decrease or disappearance of the base flow in rivers; undefined subsidence in the level of groundwater; formation of cracks; differential ground settlements; salt-water intrusion in coastal aquifers; bad-quality water migration. These impacts can cause economic losses to the users and to society.
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 groups of a specific receiver body, with the purpose of conserving and controlling the quality of the waters, in accordance with the 2004 National Water Law and the By-Laws derived from that Law. NWL.- Article 3 Section XIV.
Perennial crops	Crops whose growth cycle is more than one year.
Permits	Permits granted by the Federal Executive Branch through the CONAGUA or the corresponding River Basin Organization, in accordance with their respective areas of competence, for the use of the nation's waters, as well as for the construction of hydraulic works and others of diverse origins related with water and government property referred to in Article 113 of the 2004 National Water Law. These permits are provisional in the case of the use of the nation's waters from the period in which the deeds are issued. NWL.- Article 3 Section XL a.
Physical irrigated area	An area that receives at least a watering.
Population center	A group of one or more municipalities in which the population is concentrated mainly in urban localities. The Metropolitan Zones are considered population centers.
Productivity of water in Irrigation Districts	The quantity of agricultural produce of all crops of the Irrigation Districts to which irrigation was applied, divided by the quantity of water applied to them. It is expressed in kg/m^3.
Prohibition zone	Those specific areas of hydrological regions, river basins or aquifers, in which no additional use of water is authorized, other than those legally established, which are controlled through specific rules, owing to the deterioration in water quantity or quality, through the affectation to hydrological sustainability, or through the damage to surface or groundwater bodies. NWL.- Article 3 Section LXV.
Protection zone	The strip of land immediately around dams, hydraulic structures and other hydraulic infrastructure and connected installations, when these works are the property of the nation, in the extension defined in each case by the CONAGUA or the corresponding River Basin Organization, in accordance with their respective areas of competence, for their protection and appropriate operation, conservation and observation. NWL.- Article 3 Section LXII.
Public Registry of Water Duties (REPDA)	A Registry that provides information and legal security to the users of the nation's waters and inherent properties through the registration of the concession and allocation deeds and discharge permits, as well as the modifications made to the characteristics of the latter.
Receiver body	The current or natural water tank, dam, irrigation channel, salt-water zone or government property into which wastewater is discharged, as well as the grounds into which this water filters or infuses, when it can pollute soils, subsoils or aquifers. NWL.- Article 3 Section XVII.
Regulated zone	Those specific areas of aquifers, watersheds, or hydrological regions, which by their characteristics of deterioration, hydrological imbalance, risks or damage to water bodies or to the environment, fragility of the vital ecosystems, overexploitation, as well as for their reorganization and recovery, require specific water management to guarantee hydrological sustainability. NWL.- Article 3 Section LXIII.
Reserve zone	Those specific areas of aquifers, rivers basins, or hydrological regions, in which use limits are established for a portion or all of the water available, with the aim of providing a public service, introducing a recovery, conservation or preservation program, or when the state resolves to use said waters for the public good. NWL.- Article 3 Section LXIV.
Reuse	The use of wastewater with or without prior treatment. NWL.- Article 3 Section XLVI.
River	A stream of natural water, perennial or intermittent, that flows into other currents, into a natural or artificial reservoir, or the sea. NWL.- Article 3 Section XLVIII.
River Basin Commission	Collegiate entities of mixed membership, not subordinate to the CONAGUA or the River Basin Organizations. An auxiliary organization of the River Basin Councils at the sub-basin level. NWL.- Article 13 BIS 1.

Annex G. Glossary

River Basin Council	Collegiate entities of mixed membership, an instrument for coordination and consultation, support, consultation and advice, between the "Commission", including the corresponding River Basin Organization, and the agencies and entities at federal, state and municipal levels, and representatives of water users' associations and organized society, of the respective watershed or hydrological region. NWL.-Article 3 Section XV. Their purpose is to design and carry out programs and actions geared to improving water management, develop hydraulic infrastructure and related services, and preserve the river basin's resources. NWL.- Article 13.
River Basin Organization	A specialized technical, administrative and legal unit, autonomous in nature, directly appointed by the head of the CONAGUA, whose attributions are established in the 2004 National Water Law and its By-Laws, and whose specific resources and budget are determined by the CONAGUA. NWL.- Article 3 Section XXXIX. Formerly known as Regional Departments.
Rural locality	A locality with a population of less than 2 500 inhabitants, which is not a municipal seat.
Salt-water intrusion	A phenomenon in which salt-water enters the subsoil towards the inner land mass, causing groundwater salinization. This occurs when the withdrawal of water causes groundwater levels to be lower than the level of seawater, thus altering the dynamic natural balance between the seawater and freshwater.
Sanitation coverage	Percentage of the population living in private housing connected to the public sanitation network or a septic tank, a river, lake or sea, overflow, ravine, crevice. This information is determined through the Censuses carried out by INEGI and estimates from the CONAGUA for intermediate years.
Streambed	The natural or artificial channel with the necessary capacity for waters of the maximum ordinary crescent to run off without overflowing. When streams overflow, the natural channel is considered as an irrigation channel, while no channel work is built; at the origin of any current, it is considered as an irrigation channel in the strict sense, when the runoff is concentrated towards a topographic depression and forms a channel, as a result of the action of the water flowing over the ground. NWL.- Article 3 Section XI.
Sustainable development	As regards water resources, this is the process which is analyzable through water, economic, social and environmental criteria and indicators, which aims to improve the standard of living and the productivity of its people, based on the necessary measures for the preservation of hydrological balance, the use and protection of water resources, in such a way that future generations' water needs are not compromised.
Technical Groundwater Committees (COTAS)	Collegiate entities of mixed membership, not subordinate to the CONAGUA or to the River Basin Organizations. They develop their activities in relation with a specific aquifer or group of aquifers – as deemed necessary. NWL.- Article 13 BIS 1.
Technified Rainfed District	Geographical areas, normally intended for agricultural activities lacking irrigation infrastructure, in which, through the use of certain techniques and works, the damage on production caused by periods of strong rain in zones with abundant, prolonged rainfall is mitigated – also known as drainage districts – or in conditions of scarcity, rain and humidity are used with greater efficiency in agricultural grounds. The technified rainfed district is made up of rainfed units. NWL.- Article 3 Section XXV b.
Total capacity of a dam	Volume of water that a dam can store at the Normal Pool Elevation (NAMO in Spanish).
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 according to the last census.
Use for public supply	For the purpose of this document, this concept is the volume of water employed for public urban and domestic uses, according to the definitions of the National Water Law.
Use for self-supplying industry	For the purpose of this document, this concept is the volume of water employed for industrial, agro-industrial, service and commercial uses, according to the definitions of the National Water Law.
Virtual water	The sum of the quantity of water employed in the productive process for the elaboration of a product.
Wastewater	Waters 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. NWL.- Article 3 Section VI.
Water footprint	The sum of the quantity of water used by each person for their different activities and which is necessary to produce the goods and services that he or she consumes. 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.

Annex G. Glossary

Watershed ("cuenca hidrologica")	A territorial unit, differentiated from other units, normally bordered on one side by waters or dividing waters – the polygonal line formed by the most elevated points in said unit – in which water occurs in various forms, and is stored or flows to an exit point that may be the sea or an inner receiver body, through a hydrographic network of irrigation channels that come together into one main channel, or the territory in which waters form an autonomous unit or differentiated from others, even without them pouring out into the sea. In this space surrounded by a topographic diversity, water resources, soil, flora, fauna, other natural resources related with the latter and the environment co-exist. The watershed, in conjunction with the aquifers, constitutes the management unit of water resources. NWL.- Article 3 Section XVI. For the purpose of the publication of availability, as per NOM.011-CNA-2000, the limits of 728 watersheds in Mexico have been established.
Wetlands	Transition zones between aquatic and terrestrial systems that constitute temporary or permanent flood areas, subject or not to the influence of tides, such as swamps, marshes and mudflats, the limits of which are made up of a type of moisture-absorbing vegetation, either permanent or seasonal; areas in which the soil is predominantly water-based; and lake areas or of permanently humid soils through natural aquifer discharge. NWL.- Article 3 Section XXX.
Withdrawal index	The result of dividing the volume of groundwater withdrawal by the volume of the total mean annual recharge.

Annex H. Abbreviations and acronyms

BANOBRAS	National Bank of Public Works and Services
CEAS	State Water and Sanitation Commission
CFE	Federal Commission for Electricity
COFEPRIS	Federal Commission for the Protection against Health Risks
CONAFOVI	National Commission for Housing Promotion
CONAGUA	National Water Commission
CONAPO	National Population Council
CONEVAL	National Council for the Evaluation of Social Development Policies
COTAS	Technical Groundwater Committee
D.R.	Irrigation District
BOD_5	Five-day Biochemical Oxygen Demand
DOF	Official Government Gazette
COD	Chemical Oxygen Demand
FONDEN	National Fund for Natural Disasters
WQI	Water Quality Index
ICOLD	International Commission on Large Dams
INEGI	National Institute of Statistics and Geography (formerly National Institute of Statistics, Geography and Informatics)
NWL	National Water Law
FDL	Federal Duties Law for water resources
NASA	National Aeronautics and Space Administration
NOM	Official Mexican Standard
WHO	World Health Organization
UN	United Nations
GDP	Gross Domestic Product
NWP	National Water Program
PROFEPA	Attorney General's Office for Environmental Protection
REPDA	Public Registry of Water Rights
SECTUR	Ministry of Tourism
SEDESOL	Ministry of Social Development
SEGOB	Ministry of the Interior
SEMAR	Ministry of the Navy
SEMARNAT	Ministry of the Environment and Natural Resources
SHCP	Ministry of Finance and Public Credit
SS	Ministry of Health
TSS	Total Suspended Solids
UNDESA	United Nations Department of Economic and Social Affairs

Annex I. Units of measurement

The units used in this document are expressed according to the Official Mexican Standard NOM-008-SCFI-1993-General Measurement Unit Systems, except as regards the use of the comma to separate whole numbers from decimals; in this case, the period is used.

Units accepted by the NOM-008-SCFI-1993

Symbol	Unit	Equivalence in Basic units
cm	centimeter	1 cm = 0.01 m
mm	millimeter	1 mm = 0.001 m
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
km/h	kilometer per hour	1 km/h = 0.2778 m/s
hm^3	cubic hectometer	1 hm^3 = 1 000 000 m^3
t	ton	1 t = 1 000 kg
ha	hectare	1 ha = 10 000 m^2 = 2.47 acres
L/s = l/s	liter per second	1 L/s = 0.001 m^3/s
W	watt	1 W = 1 m^2 kg/s^3

Units not included in the NOM-008-SCFI-1993

Symbol	Unit	Equivalence in Basic units
msnm	meters above sea level	----------------
pesos	Mexican pesos	1 Mexican peso = 0.097 United States dollars = 0.058 euros *
USD	United States dollar	1 United States dollar = 10.25 Mexican pesos *
MAF	million acres-feet	1 MAF = 1.23 km^3
AF	acre-feet	1 AF = 1234 m^3
m^3	cubic meter	1 m^3 = 0.000810 AF
in	inch	1 in = 25.4 mm
mm	millimeter	1 mm = 0.0394 in
ft	foot	1 ft = 0.3048 m
m	meter	1 m = 3.281 ft
gal	gallon	1 gal = 3.785 L
L	Liter	1 L = 0.2642 gal
cfs	cubic feet per second	1 cfs = 0.0283 m^3/s
m^3/s	cubic meters per second	1 m^3/s = 35.3 cfs

* An approximate exchange rate from June 2008 was considered.
Examples of measurement:
1 m^3 = 1 000 liters
1 hm^3 = 1 000 000 de m^3
1 km^3 = 1 billion hm^3
TWh = 1 000 GWh = 1 000 000 MWh

Prefixes to formulate multiples

Symbol	Name	Value
T	tera	10^{12}
G	giga	10^9
M	mega	10^6
k	kilo	10^3
h	hecto	10^2

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