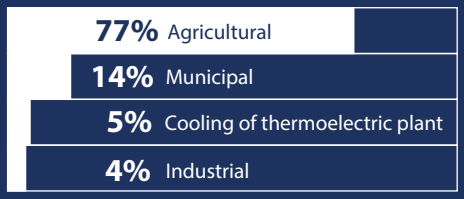
UN WATER

Mexico

UN-Water Country Brief

		year
Total population (UN Population Division)	**116.15** million inhabitants	2012
Total area	**1.96** million km^2	
Population density	**59** inhabitants/km^2	2012
Human Development Index (UNDP) (between 0 and 1; 1 is highest) Country rank (total 186 countries; 1 is highest) Gender Inequality Index (0 is equality between women and men; 1 is least equality)	**0.775** **61** **0.382**	2012
Water, sanitation and hygiene-related deaths % of total deaths (WHO)	**1.7** %	2004
Long-term average annual precipitation (CONAGUA)	**760** mm/year	
Long-term average actual renewable water resources (FAO AQUASTAT)	**451 883** million m^3/year	
Actual annual renewable water resources per capita (FAO AQUASTAT)	**3 879** m^3/inhabitant	2012
% of total actual renewable freshwater resources withdrawn (MDG Water Indicator) (FAO AQUASTAT)	**17.6** %	2006
Groundwater withdrawal as % of total freshwater withdrawal (CONAGUA)	**37.5** %	2009
Total area equipped for irrigation (CONAGUA)	**6.46** million ha	2009
% of irrigation potential equipped for irrigation (CONAGUA and FAO AQUASTAT)	**66** %	2009
Ramsar sites (Ramsar) – number – total area	**138** sites **8.8** million hectares	2013

Water withdrawals by sector
(total 80 590 million m^3 in 2009)



The Money Stream

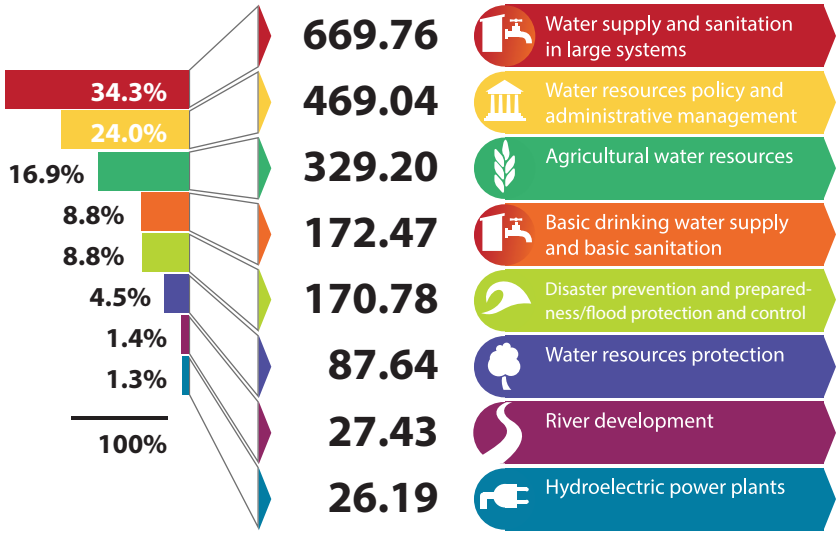
From 2003 to 2011, the water-related government budget accounted for an estimated 1.8 percent of total government expenditure.

Over the period 2003 to 2011, over 43 percent of the water-related government budget was channeled into water supply and sanitation, and almost one quarter into water resources policy and administrative management. Agricultural water resources accounted for close to 17 percent, disaster-related national investments for just under 9 percent and water resources protection for over 4 percent. Whereas close to 95 percent of water-related official development assistance (ODA) over the same period was channeled into water supply and sanitation, some 3 percent into water resources policy and administrative management and close to 2 percent into water resources protection.

% of water-related government budget to total government expenditure 2003 - 2011

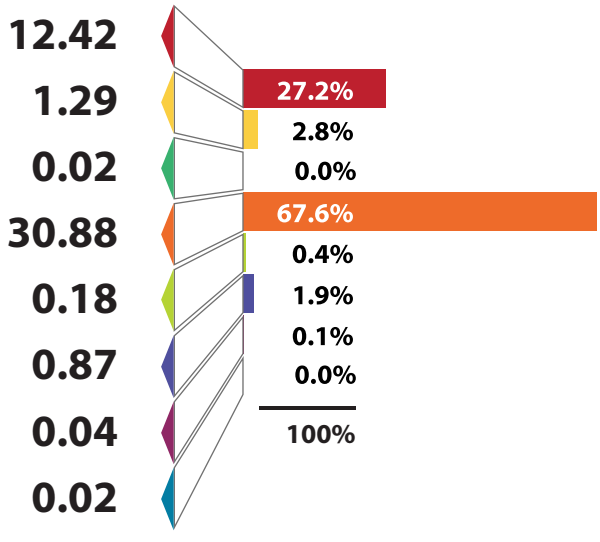
1.8%

Annual average government budget during the period 2003 - 2011
(million constant 2010 US$)



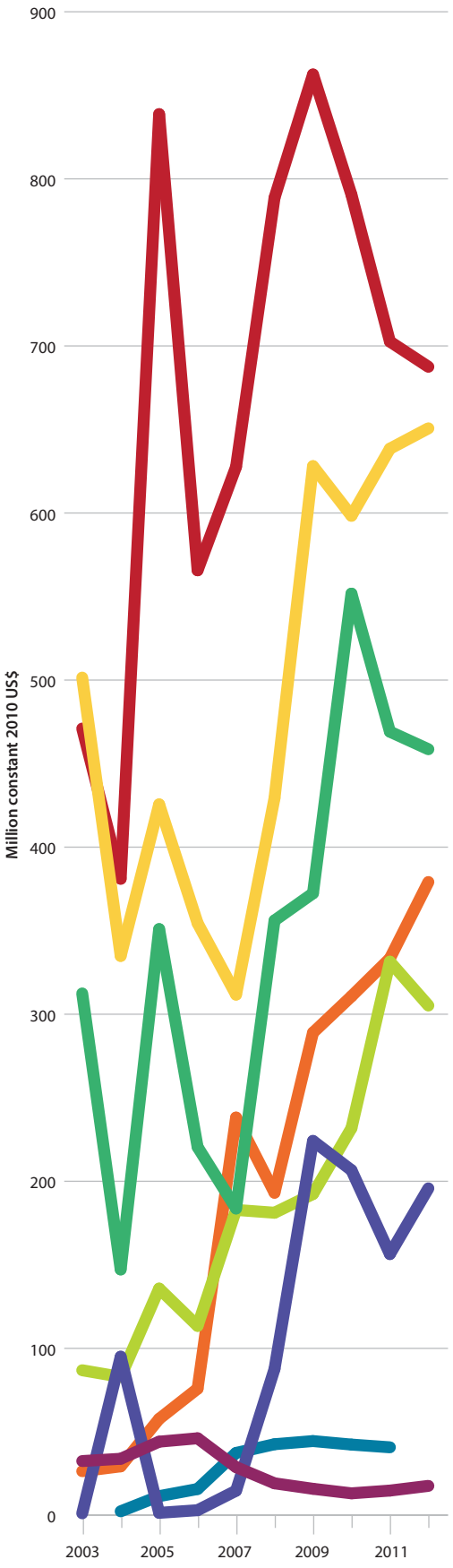
total annual average **1952.51**

Annual average official development assistance gross disbursements during the period 2003 – 2011
(million constant 2010 US$)

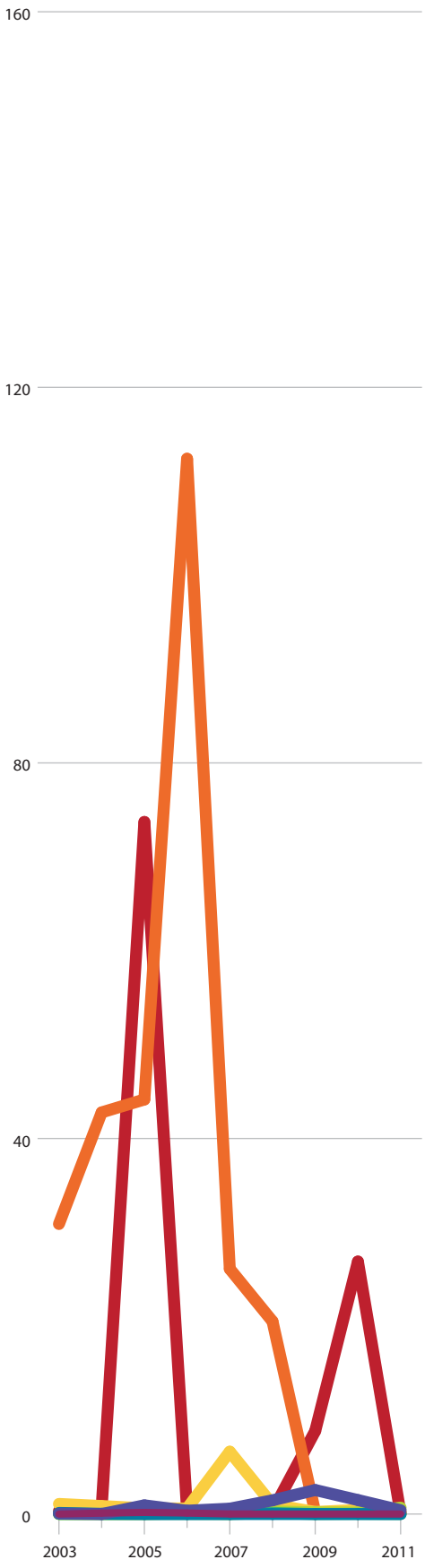


45.72 total annual average

Government budget during the period 2003 – 2012
(million constant 2010 US$)
Note: Government budget data for hydro-electric power plants only from 2003 to 2011



Official development assistance gross disbursements during the period 2003 - 2011
(million constant 2010 US$)



Water-related government budget during the period 2003 to 2012:

- The national water-related budget has generally been trending up.
- From 2006 to 2012, the Government of Mexico gave increased emphasis to water resources management, as articulated in the 2030 Water Agenda of Mexico.
- The vast majority of river development, hydroelectric power plants, agricultural water resources and disaster prevention and preparedness and flood prevention / control is funded through the government budget with little official development assistance.

Water-related official development assistance during the period 2003 to 2011:

- The ODA emphasis has been on basic and large water supply and sanitation systems, with peaks occurring in 2005 (large systems) and 2006 (basic systems).

The data for government budget, i.e. what the government had planned to spend during a given year, excludes official development assistance (ODA). The OECD Creditor Reporting System categories were chosen for the collection of these water-related investments and the data was obtained by the WCB project through in-country research in cooperation with the government (during 2012), while ODA data stems from the OECD Creditor Reporting System (collected November 2012).

Water supply and sanitation in large systems: Water desalination plants; intakes, storage, treatment, pumping stations, conveyance and distribution systems; sewerage; domestic and industrial wastewater treatment plants.

Basic drinking water supply and basic sanitation: Water supply and sanitation through low-cost technologies such as hand-pumps, spring catchment, gravity-fed systems, rainwater collection, storage tanks, small distribution systems; latrines, small-bore sewers, on-site disposal (septic tanks).

Water resources policy and administrative management: Water sector policy, planning and programmes; water legislation and management; institution capacity building and advice; water supply assessments and studies; groundwater, water quality and watershed studies; hydrogeology. Excluding agricultural water resources.

Disaster prevention and preparedness/Flood protection and control: Disaster risk reduction activities such as developing knowledge, natural risks cartography, legal norms for construction; early warning systems; emergency contingency stocks and contingency planning including preparations for forced displacement. Floods from rivers or the sea; including sea water intrusion control and sea level rise related activities.

Agricultural water resources: Irrigation, reservoirs, hydraulic structures, groundwater exploitation for agricultural use.

Hydroelectric power plants: Including power-generating river barrages.

Water resources protection: Inland surface waters (rivers, lakes, etc.); conservation and rehabilitation of groundwater; prevention of water contamination from agrochemicals, industrial effluents.

River development: Integrated river basin projects; river flow control; dams and reservoirs. Excluding dams primarily for irrigation and hydropower and activities related to river transport.

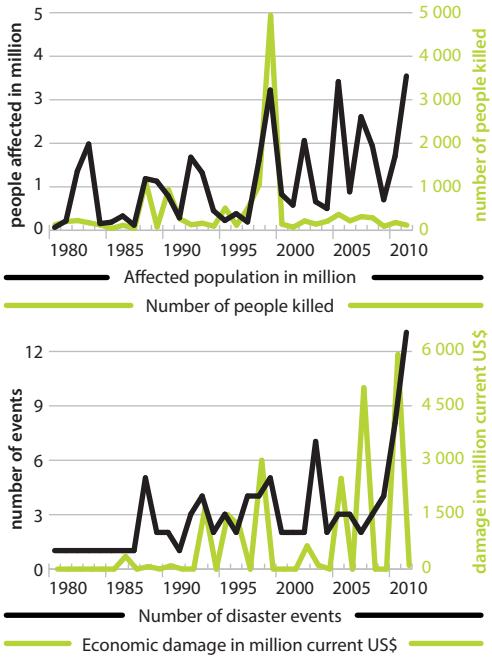
Water - related Disasters*

Impact for development
Between 1980 and 2007, hydro-meteorological events in Mexico have affected 8 million people and caused 130 billion pesos (close to 10 000 million 2011 US$) worth of damage (CONAGUA, 2011). Analysis of the EM-DAT database indicates that water-related disasters account for over 80 percent of economic damage caused by natural disasters in the country.

Mexico is highly susceptible to a number of water-related disasters* mainly landslide, floods and tropical cyclones that may cause deaths and destruction, potentially affecting long-term investment and economic growth. There was a sharp spike in the number of water-related disasters in Mexico in 2010 and 2011, but the number of human causalities from such disasters, while occasionally high, has on average remained constant (mainly after year 2000). On the other hand, economic loss and the number of disaster-affected people are growing. The data shows that hurricanes dominate, to 98 percent of water-related disasters, in terms of the number of disaster occurrences and damage in the disaster history of the country.

* 'Water-related disasters' within the scope of this WCB study do not include droughts.

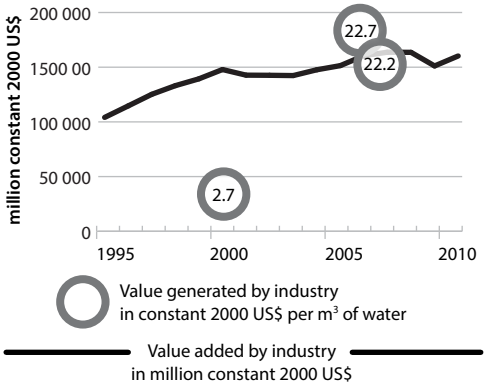
Water-related disasters impacts
(Centro de Investigaciones y Estudios Superiores en Antropología, UNISDR)



Water Intensity in Industry

Impact for development
While during 2002 to 2007 there was a more than eightfold increase in the value generated by industry per m³ of water, during 2007 to 2008 this value decreased by 2%. In general, water is a driver for industry both from the perspective of securing stable supply water sources for industrial production as well as from the standpoint of enhancing operating efficiency and reliability.

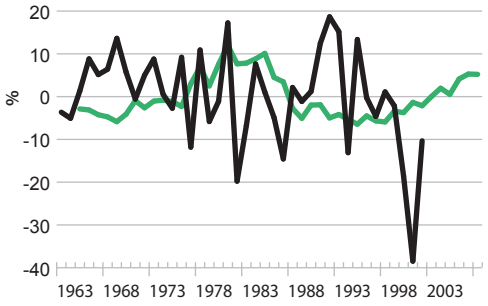
Value generated by industry per m³ of water
(FAO AQUASTAT, World Bank)



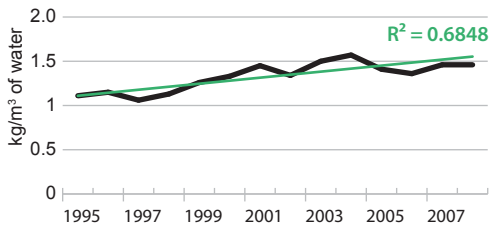
Irrigated Agriculture

Impact for development
Agriculture accounts for approximately 4 percent of gross domestic product and employs around 16 percent of the workforce in Mexico. In 2012, women accounted for 12 percent of the economically active population in agriculture. Irrigated agriculture accounts for approximately 50 percent of the total value of agricultural production and 70 percent of Mexico's agricultural exports. Yield from irrigated crops have been estimated at 3.5 times the yields from dryland crops (27.3 versus 7.8 metric tons per hectare for maize). Key irrigated crops include maize, sorghum, wheat, fruit, vegetables, fodder, sugarcane, and pulses.

Rainfall variability and agricultural GDP
(FAO AQUASTAT, World Bank)

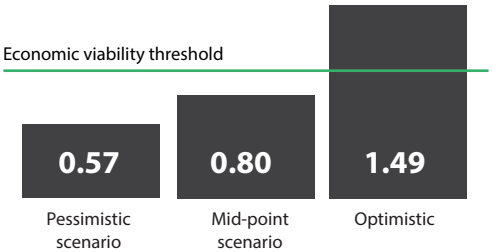


Productivity of water in irrigation schemes
(CONAGUA)



Approximately 77 percent of Mexico's cultivated area is not irrigated and there has been limited expansion of irrigated agriculture since the mid 1990s, with the percentage of potential irrigation area equipped for irrigation remaining between 64 to 66 percent. Rather, the focus of investments has been on improving water productivity within already constrained water availability circumstances. This has resulted in gradual improvements in productivity in irrigated agriculture (in terms of kg/m³ of water) under highly variable precipitation patterns.

Economic viability of establishing new irrigation schemes for corn

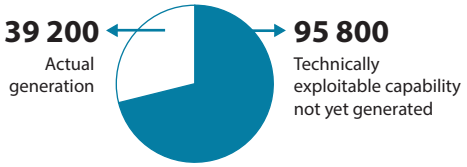


The economic viability of new irrigation schemes is highly dependent on the ability to achieve efficient agronomic practice productivity gains (i.e.: efficient crop varieties and use of fertilizers), in addition to gains directly related to a move from dryland cropping to irrigated cropping. The analysis of expanding irrigation for an important crop such as maize indicates that it is unlikely to be economically viable unless the most optimistic of assumptions can be achieved.

Energy for Water, Water for Energy

Impact for development
In Mexico, increasing the rate of access to centralized wastewater treatment plants in rural areas is in part constrained by the energy needs to transport sewerage over long distances. Moreover, the sinking of Mexico City has resulted in the need to pump the wastewater out of the city, a system once operated by gravity. The energy provided by the national utility for pumping of water in agriculture amounted to 5.4 percent (10 973 GWh) of the total energy the utility provided (202 226 GWh) in 2011.

Hydropower capacity and generation, 2008, in GWh/year (World Energy Council)



Environment and Ecosystem Health

Impact for development
In Mexico, more than 70 percent of the water bodies have some degree of contamination: lakes, rivers, mangroves and coasts are polluted, affecting humans, animals and plants that inhabit these ecosystems. The water balance in a growing number of cities and regional economic activities is sustained by overexploitation of renewable groundwater, and overuse of environmental flows.

Water quality index 2010
(UNEP-GEMS/Water)

A score of 100 indicates that water quality targets are met for all five parameters (DO, pH, conductivity, total nitrogen, and total phosphorus).

Key statistics for the period 1990 to 2010 show an improvement in overall use of improved drinking water sources, increasing from 85 percent of the population in 1990 to 96 percent in 2010, with 91 percent of the rural population and 97 percent of the urban population in 2010. There has been a significant improvement in the use of improved sanitation facilities, from 64 percent in 1990 to 85 percent in 2010. The relative improvements in rates of use have been greatest in rural areas (from 34 percent in 1990 to 79 percent in 2010).

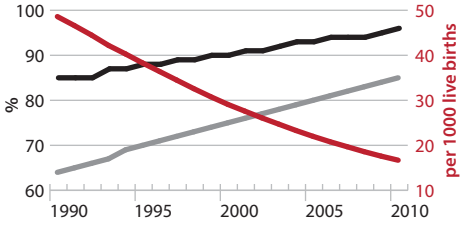
Drinking Water Supply and Sanitation

Impact for development
Investments over the past 20 years in Mexico have significantly closed the gap between access to services for urban and rural populations, which have contributed to an ongoing improving trend in reduced infant mortality. In general, improved water and sanitation infrastructure and services provide multiple benefits to the local population for health (mortality) and labour productivity (lower workplace absenteeism) outcomes. They can also underpin confidence and expand markets for industries such as tourism.

Accession of the International Covenant on Economic, Social and Cultural Rights (ICESCR):
23 March 1981

(The right to water is implicit within the right to an adequate standard of living and inextricably related to the right to the highest attainable standard of health outlined in the ICESCR.)

Access to drinking water and sanitation & under-5 child mortality
(UN Inter-agency Group for Child Mortality Estimation (IGME) and WHO/UNICEF Joint Monitoring Programme)

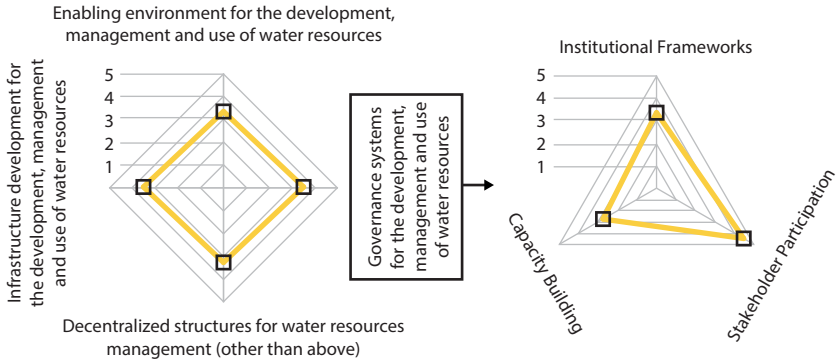


Improved drinking water source
Improved sanitation facilities
(both indicators above in % of total population)
Under 5 child mortality rate
(probability of dying by age 5 per 1000 live births)

Tracking Water Governance

Impact for development
The Government of Mexico has focused on the formulation and implementation of the 2030 Water Agenda to develop a long-term vision to achieve the sustainable use of water resources. The 2030 Water Agenda focuses on achieving balanced supply and demand for water, clean water bodies, universal access to water services and settlements safe from catastrophic floods, among other recommended initiatives. In general, nations that prioritize water policies successfully improve their social and economic development.

UN-Water survey on integrated approaches in the development, management and use of water resources governance, 2012 (UN-Water)



1 Under development
2 Developed but implementation not yet started
3 Implementation started
4 Implementation advanced
5 Fully implemented

Mexico has a comprehensive legal system, a national water authority, a functioning water rights system, and emerging water markets. In 1992, Mexico adopted a National Water Law, which contained specific provisions for the role of CNA (now called CONAGUA), the structure and functioning of river basin councils, public participation in water management, etc. With the 2004 Revision of the law, the thirteen decentralized regions would become basin organizations serving as the technical arm of more broad-based basin councils that incorporate civil society interests including the private sector and citizens' groups. The Federal Revenue Law, published yearly, establishes amongst others a system of charges for water use by water use sector and wastewater discharges. The enforcement of wastewater regulation in Mexico is limited, due to insufficient investments.

Rapid Assessment

Overall

Pressures on water

From a broad perspective, the most pressing problem related to water management in Mexico is intensifying water scarcity, a situation which is already reaching critical levels in some river basins. The main drivers of this change are unregulated economic development and population growth, growing demand for water by agriculture and industry, pollution of surface water and groundwater, deforestation and soil erosion, and the emerging impacts of climate change. Despite many achievements in recent years, water management in Mexico still faces challenges of overexploitation of renewable groundwater, water quality decline, lack of financial resources for additional water-related investments, modernization of water supply and sanitation services, low efficiency of irrigation, strengthening of the legal status of water institutions, and adaptation to climate change impacts, especially droughts and floods.

Investments

National water-related investments have increased, driven primarily by investments in water supply and sanitation, agriculture, and water resources policy and administrative management. An estimated 1 024 billion pesos (77 000 million in 2011 US$) are required by 2030 for water-related infrastructure, operation and maintenance and governance actions (CONAGUA, 2011) to address the challenges the country is facing in managing its water resources sustainably.

Assessments

Irrigated agriculture

●●●○○

Use of wastewater and agricultural drainage water in agriculture is common in Mexico. Available options for transforming rainfed to irrigation areas are the reallocation of water resources, the use of treated wastewater in agriculture, the efficient use of water in irrigation, and the capture of rainwater in small dams.

Drinking water supply and sanitation

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Significant improvements in the use of improved drinking water sources and improved sanitation facilities, although not total coverage yet. Water reuse in municipal supplies and for aquifer recharge is limited.

Water intensity in industry

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Tenfold increase in value generated per m^3 of water. The disposal of industrial wastewater without appropriate treatment is a worrying situation in the country.

Water-related disasters

●●○○○

While the number of deaths from disasters has remained constant, the economic loss and number of disaster-affected people are growing. As a result investment in prevention has been increasing to address this issue.

Water for energy, energy for water

●●●○○

Providing water for agriculture, industry and municipalities consumes large amounts of energy. At the same time in 2011 hydropower provided 13.8 % of Mexico's energy. Efforts exist to use energy more efficiently, including its use for providing water.

Environment and ecosystem health

●●●○○

Seventy percent of the water bodies have some degree of contamination. Lack of monitoring, enforcement of existing laws, incentives and penalties for polluting municipalities and industry contribute greatly to water quality problems in Mexico. There is overexploitation of renewable groundwater and overuse of environmental flows in certain localities. A water reserves for the environment initiative, aimed to ensure environmental flows and maintaining ecosystem services, is showing promising development to preserve ecosystems and their water supplies.

Tracking governance

●●●●○

Mexico has a comprehensive legal system, a national water authority, a functioning water rights system, and emerging water markets. The enforcement of wastewater regulation in Mexico is limited, due to insufficient investments.

Data Quality

★★★☆☆

Overall, data is available, but there is limited data available on the overall benefits and costs of irrigation investments

★★★★☆

Data is available, but limited data on drinking water quality is available.

★★☆☆☆

National data difficult to obtain

★★★★☆

Data is available

★★★★☆

Data is available.

★★★☆☆

National data difficult to obtain

★★★★☆

Qualitative data is available. There is no data available on the equity and human rights on sanitation and drinking water within the UN-Water GLAAS Report 2012.

Legend:

The rapid assessment of the situation above, based on available data, was established in conjunction with in-country experts and officials. It provides an overview of trends according to the following:

●○○○○ trends are of significant concern

●●○○○ trends are of concern

●●●○○ trends are stable or, progressing on certain issues but not on others

●●●●○ trends show some measure of improvement in all relevant indicators assessed

●●●●● trends show significant improvement and there is no concern

○○○○○ insufficient data

Accurate assessments of progress require relevant, accurate and timely data. The above data quality assessment ranges from:

★☆☆☆☆ very poor → ★★★★★ very good

Data Concerns

Data is a vital input to water management and investment in water-related infrastructure and projects. The lack of quality and reliability of economic data (e.g. infrastructure costs, operating costs etc.) in Mexico makes water-related investment decisions inherently more complex and investments more risky for investors. However, it should ne noted that the significant programme of work being undertaken by CONAGUA is addressing many of those issues.

An assessment of priority data needs from the basis of national decision-makers and international investors (donors and loan capital) would be prudent to conduct, so as to establish a forward-looking work programme of data management.

It is to be noted that it is virtually impossible to find national-level gender-disaggregated data for almost all themes contained in the UN-Water Country Briefs.

Disclaimers

- The most recent and updated information can be found in the original databases cited throughout.
- The rapid assessment methodology presented here is an advocacy tool designed to generate debate and attention to the issues, and is developed in conjunction with national government focal points.
- Data presented herein stems either from existing databases or was collected from national reports, experts and institutions, and in some cases raw data underwent various manipulations to categorize the information for this presentation.
- Due to data limitations, the investment-related estimates may not include water-related investments that are counted under other categories of investments, and some investment categories (i.e.: disaster prevention and preparedness) may include some investments that are not directly water-related. Moreover, water being a crosscutting issue, investments in other parts of the government (not calculated here) may also benefit water management.
- The words investments/invested/funded for ODA refer to gross disbursements of ODA according to the OECD definitions. The words investments / invested / funded for government refer to government budget (2003-2012). In addition, investment data and analysis do not include any other forms of investment (such as, private sector investments).
- The benefit-cost analysis on expansion of irrigation is based on very limited data and any decisions should be based on detailed cost-benefit analysis that incorporates all relevant local data.

UN WATER

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Additional information on the project, data and methodologies can be accessed at:

http://www.unwater.org/WaterCountryBriefs.html

MEXICO

Legend

- International Boundary
- Administrative Boundary
- Capital, Regional Capital, Town
- River
- Lake
- Dam (> 3 Km^3)
- Zone of Irrigation Development

0 100 200 400 km

Albers Equal Area Projection, WGS 1984

FAO - AQUASTAT, 2013

Disclaimer

The designations employed and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

States of Mexico

1 Aguascalientes
2 Baja California
3 Baja California Sur
4 Campeche
5 Chiapas
6 Chihuahua
7 Coahuila de Zaragoza
8 Colima
9 Durango
10 Guanajuato
11 Guerrero
12 Hidalgo
13 Jalisco
14 México
15 Michoacán de Ocampo
16 Morelos
17 Nayarit
18 Nuevo León
19 Oaxaca
20 Puebla
21 Querétaro de Arteaga
22 Quintana Roo
23 San Luis Potosí
24 Sinaloa
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26 Tabasco
27 Tamaulipas
28 Tlaxcala
29 Veracruz
30 Yucatán
31 Zacatecas