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Institutional and Regulation preparation to face drought in Colombia

Water Smart Innovations
Conference and Exposition
2016
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Las Vegas, Nevada - United States

Outline

1. Introduction
2. Context
3. Institutional framework
4. Regulatory framework
5. Activities in 2015
6. Developments and Challenges

1. Introduction

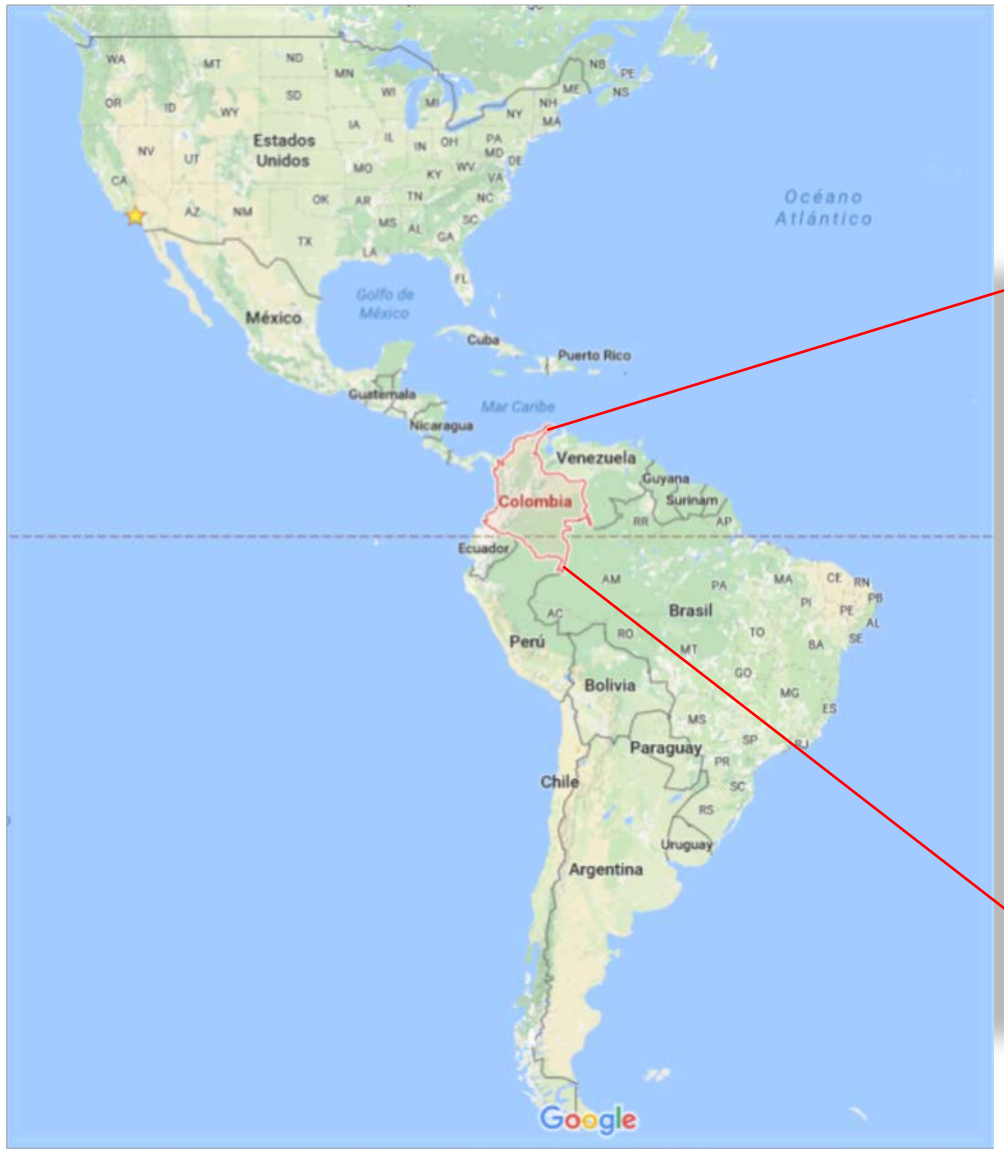
Objectives

- Review the most important consequences of this drought, with the reduction of water supply for many of users, and considerable impacts for the country´s economy.
- Provide examples of how the national public administration has responded both in normal times and during the current drought, including:

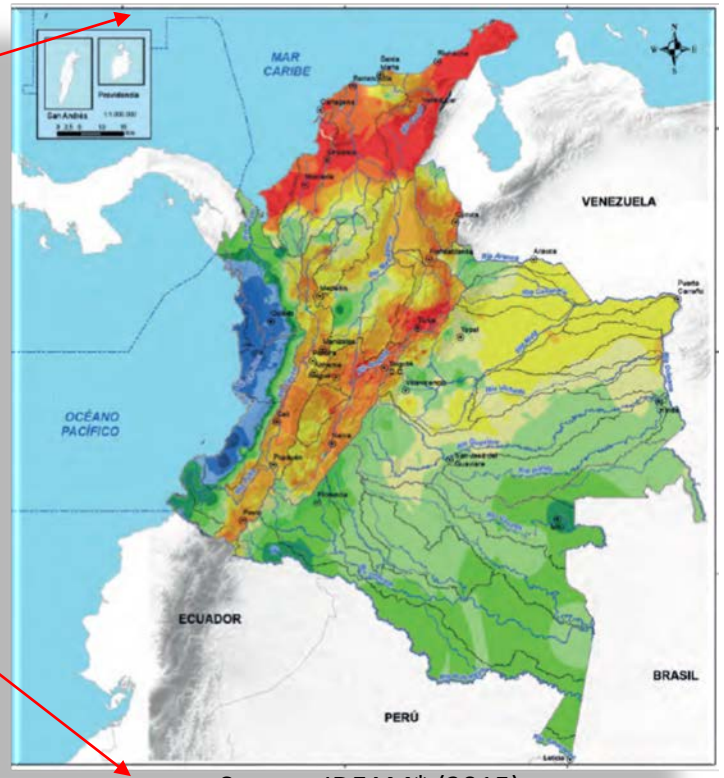
  ❑ Progress of water conservation opportunities and challenges in Colombia

  ❑ Hosted a national seminar to bring together 200 water leaders to address issues of drought response and integrated resource planning.

LOCATION



Source: Google Maps (2016)



Source: IDEAM* (2015)

Boundary:
North → Panama
East→ Venezuela and Brazil
South →Ecuador and Peru
Colombia has two coasts, Pacific Ocean and Caribbean Sea

Area
2.129.748 Km^2

IDEAM: Institute of Hydrology, Meteorology and Environmental Studies*

2. Context

Surface water offering- Year 2012

Source: Wilches (2009) – Snow Mountain Tolima

Coello river, 2015

	Catchment	Area (Km^2)	Water offering (Mm^3/year)**		Runoff (mm/year)	
			Average	Dry	Average	Dry
1	Caribe	102.868	182.865	103.221	1.778	1.003
2	Magdalena-Cauca	271.132	271.049	119.917	1.000	442
3	Orinoco	347.228	529.469	324.705	1.525	935
4	Amazonas	342.010	745.070	503.462	2.179	1.472
5	Pacífico	77.309	283.201	166.239	3.663	2.150

**1 Cubic Million Metres = 264.172 Million US Gallons

Source: IDEAM* (2015)

IDEAM: Institute of Hydrology, Meteorology and Environmental Studies*

Water Demand

Water use

Users	Water demands 2012 (Mm^3)	Porcentage (%)	Return (Mm^3)**	Loss (Mm^3)
Domestic (residential)	2963,4	8,2%	1670,5	921,6
Agriculture	16760,3	46,6%	s.I	s.I
Livestock	3049,4	8,5%	s.I	563,4
Aquaculture	1654,1	4,6%	1654,1	s.I
Industry	2106,0	5,9%	2000,7	493,5
Energy	7738,6	21,5%	1273,6	364,4
Petroleum production	592,8	1,6%	s.I	s.I
Mining	640,6	1,8%	s.I	s.I
Commercial, institutions	481,8	1,3%	433,6	137,7
Total	35987,1	100%	7032,6	2480,5

Source: IDEAM* (2015) *IDEAM*: Institute of Hydrology, Meteorology and Environmental Studies*

**1 Cubic Million Metres = 264.172 Million US Gallons

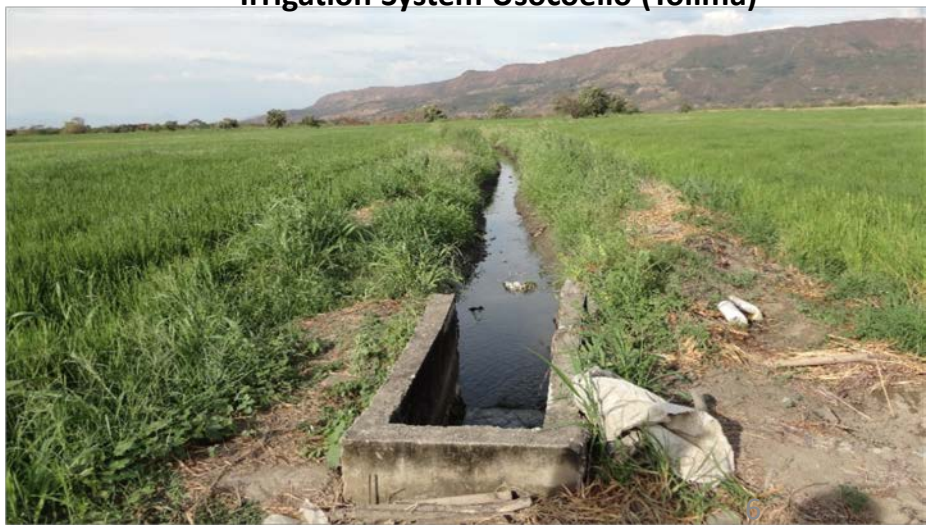
Small Hydro Power Coello (Tolima)

Source: MADS (2015) *MADS*: Ministry of Environment and Sustainable Development*

Municipal
Drinking Water Treatment Plant Armenia (Quindío)

Source: MADS (2015)

Agriculture
Irrigation System Usocoello (Tolima)



Source: MADS (2015)

Issues

- High loss water
  - Agriculture use→ 60 %
  - Domestic use→40-60%

- High water extraction from fresh surface and groundwater sources.

- Reduction of availability of water sources due to dry periods.

- More than 80 % of the municipalities are supplied by sources that do not have sufficient flow for this purpose.

- Approximately 110,000 people affected by water shortages and involvement of animals in the department of Casanare by drought conditions.

Example: Casanare Department
Drought

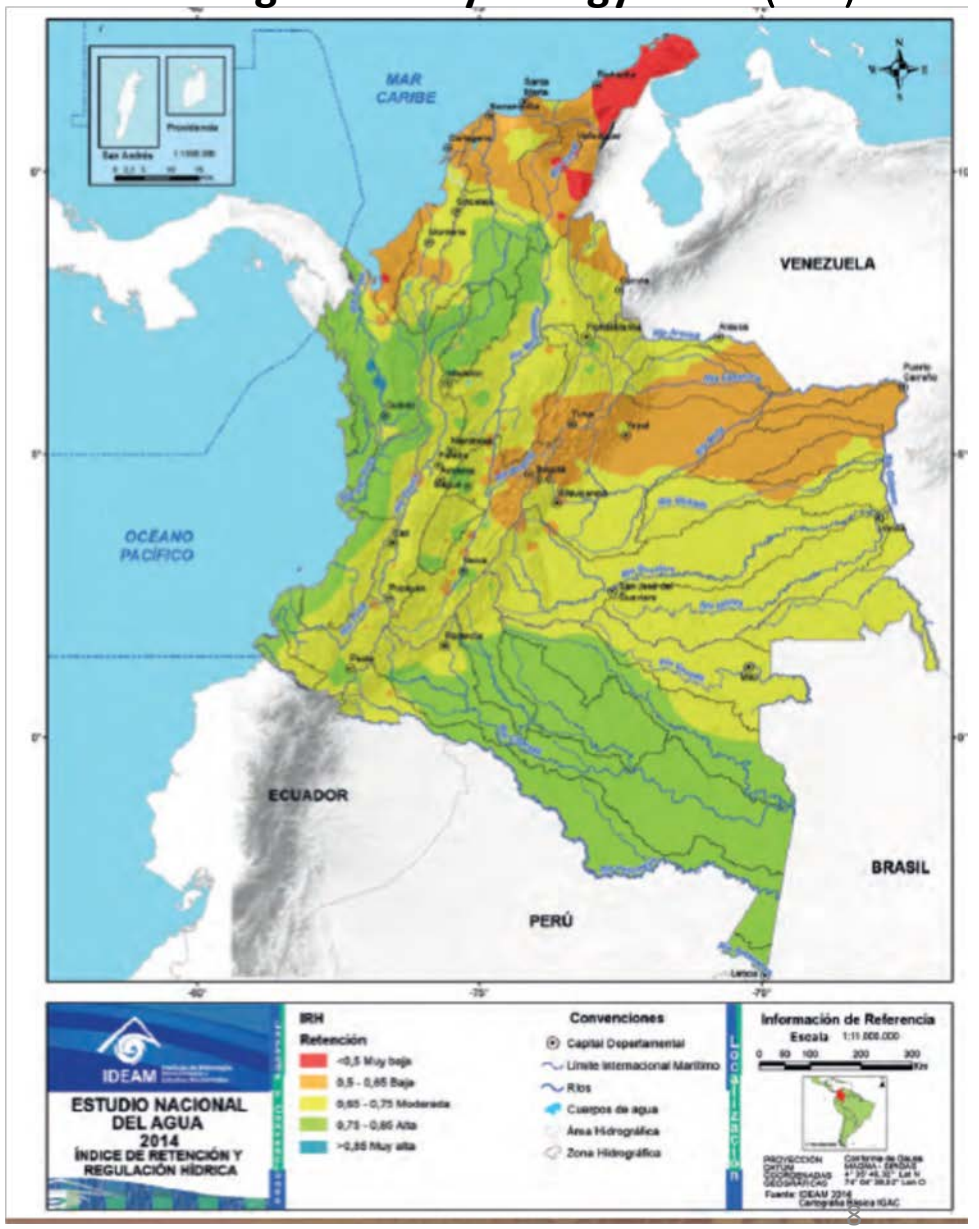
Source: El Tiempo (March, 2014)

Consequences

- Higher water demand produces higher wastewater flows → wastewater treatment costs increases.
- Water shortages and rationing. In 2015 and 2016 there were more than 100 municipalities that had rationing.
- The economic loss in 2015 by the involvement of forest fires in forests was approximately, equivalent to 0.063 % of GDP in 2015 (*DNP* , 2016*)".
- Conflicts over water use.
- Water inefficiency involves higher costs in drinking water supply systems.
- Reducing water availability

*DNP: National Planning Deparment

Regulation Hydrology Index (IRH)



Source: MADS (2016) – ENA (Water National Study)

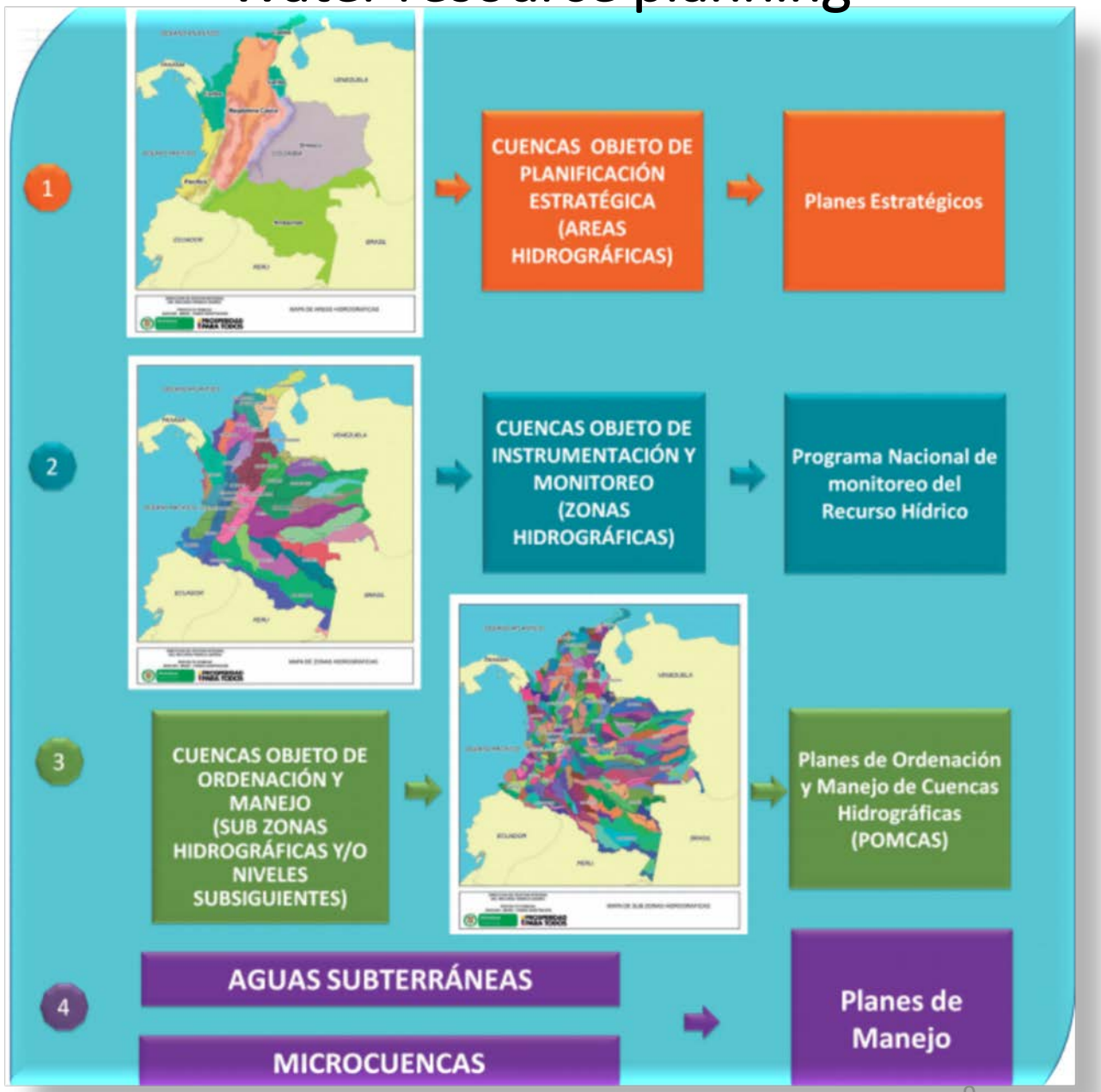
3. Institutional framework

National Policy for Integrated Water Resource Management

Main Objective:

Ensure the sustainability of water resources through management and an efficient and effective use , articulated to land management and the conservation of ecosystems that regulate water supply, considering water as a factor of economic development and social welfare, and implementing process equitable and inclusive participation.

Water resource planning

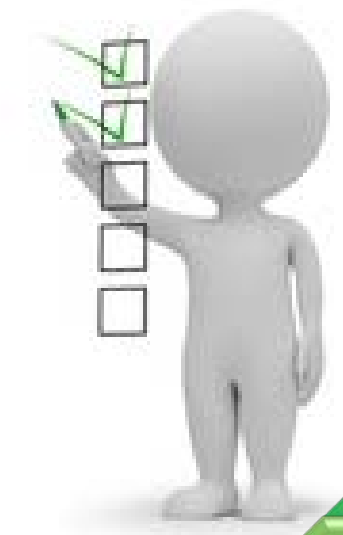


Fuente: MADS (2010) - PNGIRH

Environmental National System (SINA)

SINA

Under coordination of the Ministry of Environment and Sustainable Development are responsible to put together some more normative and institutional aspects for their implementation.



Policies, Guidelines, Plans and Programs

Policies

- Urban Environmental Management Policy (2008)
- National Policy Production and Consumption (2010)
- National Policy for Integrated Water Resource Management (2010)

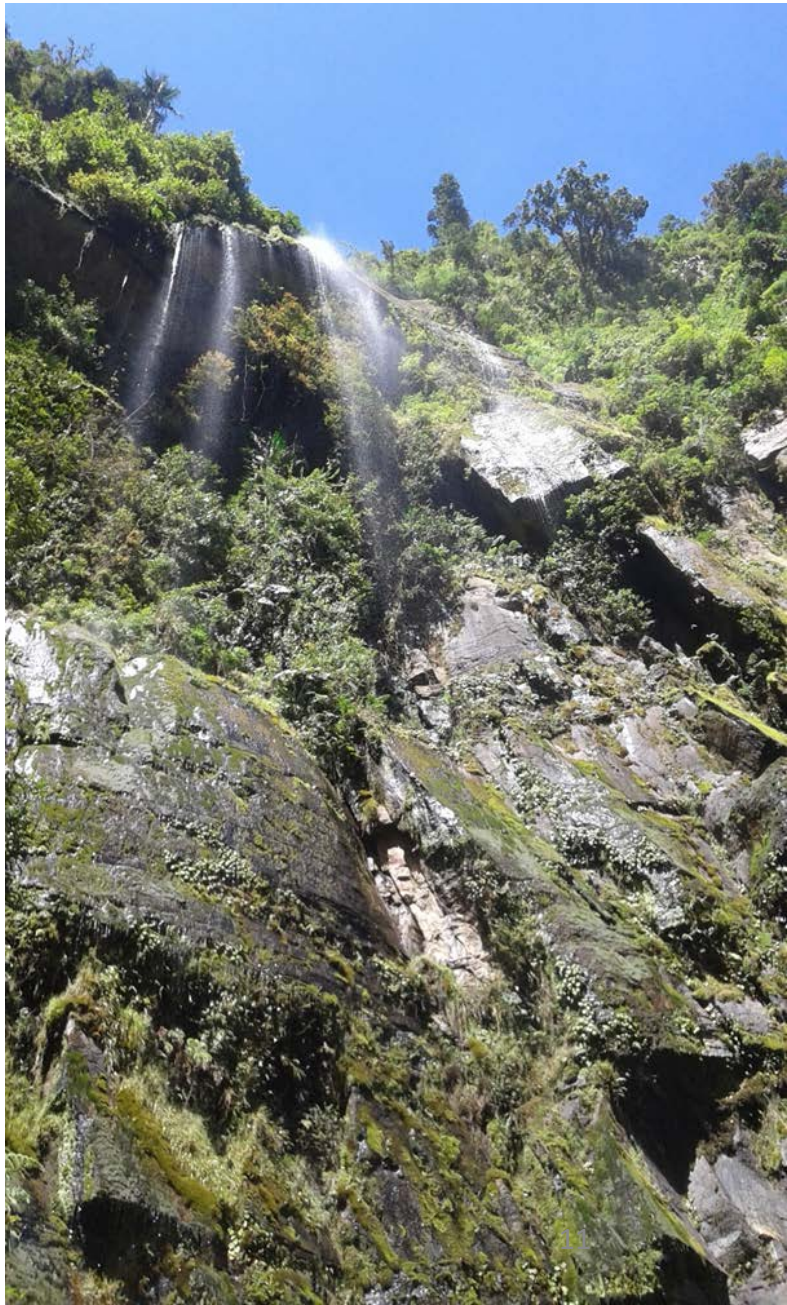
Plans

- National Action Plan to Combat Desertification and Drought (2006)
- National Plan for Adaptation to Climate Change (2012)
- National Development Plan (2014-2018)

Guidelines

- Guide savings and efficient use of water (2002)
- Environmental criteria for the design and construction of housing (2012)
- Environmental guidelines (agriculture).

Waterfall La Chorrera
Choachí (Cundinamarca)



4. Regulatory framework

In 1974 was formulated the Renewable Natural Resources and Environmental Protection Code, it defined as one of the principles, the use efficiency of natural resources. Since then, the government has development some instruments aim to promote water use efficiency.

In 1997 was formulated Law 373. This established Efficiency and Water Saving Programs (PUEAA).

The use efficiency and save water programs are a strategy to integrate and articulate an effort done by institutions in order to face drought, moreover these are an opportunity to change use paradigm among all Colombians.

In 2015 was compilated all of decree of Environment and Sustainable Development Sector in the Decree 1076.

Efficiency and Water Saving

Decree

- Decree – Law 2811/74
- Decree 1076/15

Law 373/97

Efficiency and Water Saving Programs -PUEAA

National Policy for Integrated Water Resource Management

Principle 6

- Objective 1. Offering
- Objective2. Demand
- Objective 4. Risk

5. Developments

2002 Guideline.

2010. National Policy for Integrated Water Resource Management.

2010. PND(2010-2014)

2012. Pacto Uso Eficiente del Agua – Sector Acueducto y Alcantarillado (ANDESCO)

2013. Pacto Uso Eficiente del Agua – Distritos Adecuación Tierras (UPRA)

2014. Pacto Uso Eficiente del Agua – Sector Hidroenergético (ANDESCO)

2014. Primera versión de la reglamentación Ley 373 de 1997.

2015. PND(2015-2018) Crecimiento Verde

2015.

WUA Information System

2015. Water use efficienty Seminar.

Projects of WUE

Update of guideline of WUE

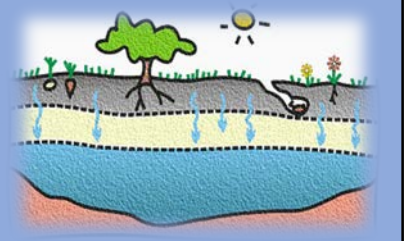
2016. Projects of WUE in Otún Basin (Risaralda Deparment)

Conceptual Framework

Efficiency Use

- Rational use
- Produce more with less quantity
- Articulation betweenn users
- Environmental flow

Saving

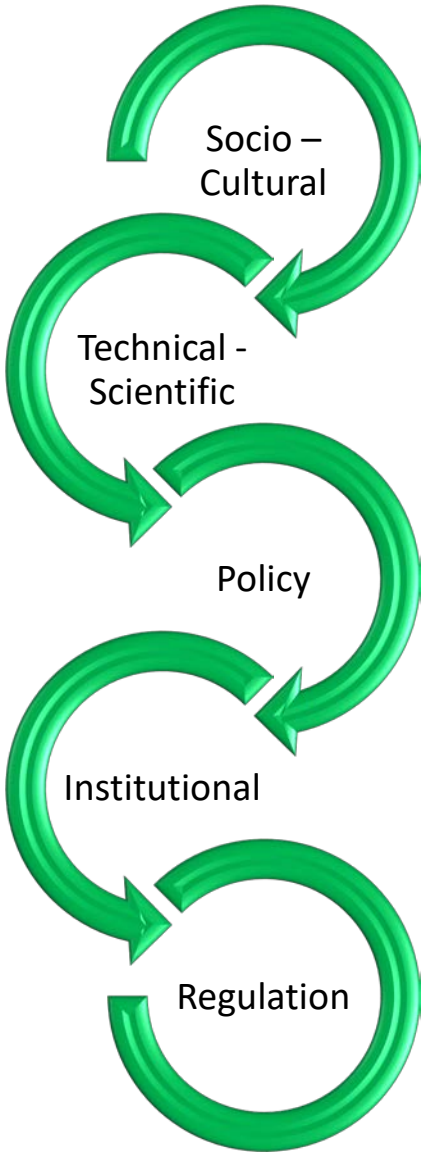


- Saving surface and groundwater at water intake.

Lines to promote water use efficiency and saving

- Recomendations to WUE at National Level.

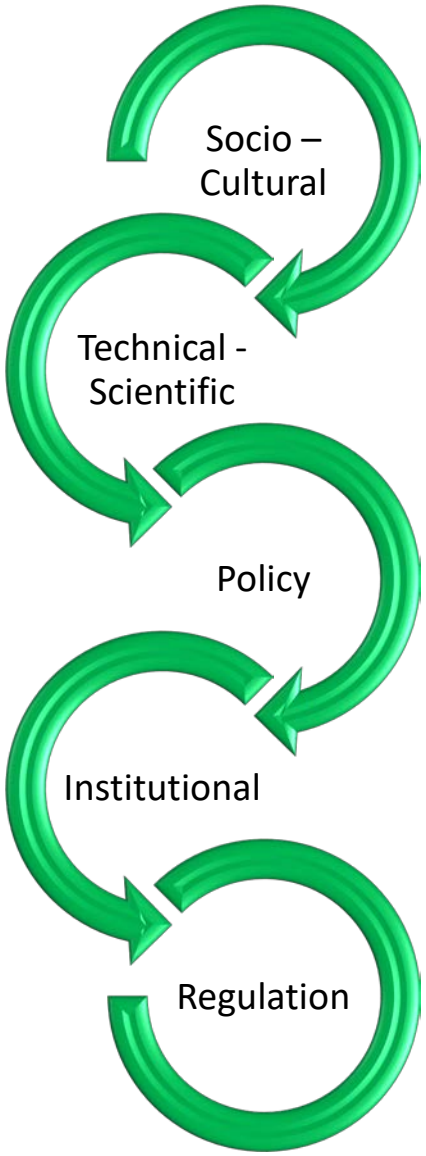
Promoting Water Use Efficiency



WUE SEMINAR

Source: MADS (2016)

Promoting Water Use Efficiency

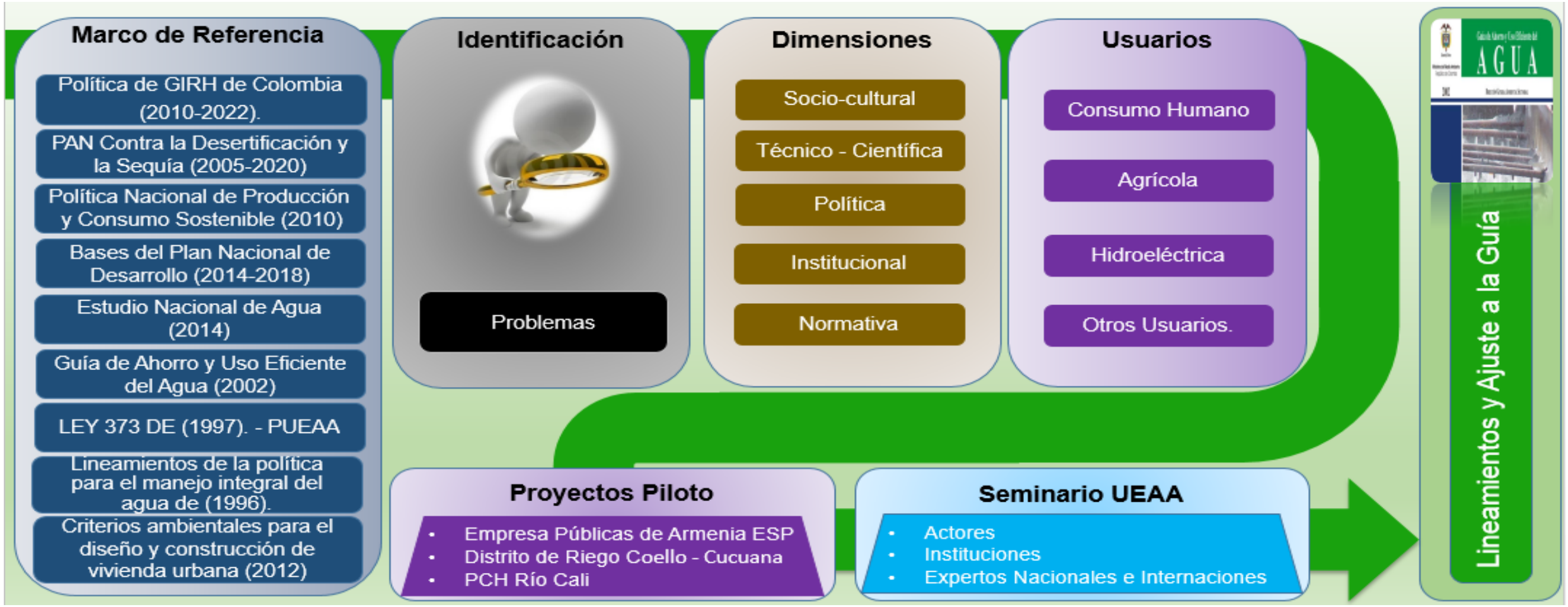


✓Exchange knowledge and experiencies.

In 2015, was hosted a national seminar to bring together 200 water leaders, it includes participation of other countries to address issues of drought response and integrated resource planning.

Source: MADS (2016)

6. Developments and Challenges



Pilot projects

Seminar

Source: MADS (2016)

Challenges

Millennium development goals (United Nations)

Goal 7. To guarantee the environment support

"Lack of water is one of the leading causes of hunger and malnutrition . The way to increase food production using less water is one of the major challenges for the coming decades. This represents an increase of production per unit of water or efficiency in water use . Techniques for achieving this are often the same as those used for sustainable intensification of agricultural production ... A 50% reduction in losses and food waste worldwide could save 1,350 km3 per year, Recycling and ... reuse of wastewater , both in agriculture and in urban and rural uses , can help fill the increasing scarcity of water" (FAO, 2012c y 2012 d) .

Conference RÍO+ 20

"Improve methods of conservation and management of our water sources to promote development and prevent desertification ".

Opportunities

- Progress of water conservation opportunities and challenges in Colombia:

✓ Update existing national guideline “saving and water use efficiency, 2002” and regulations.

✓ National Lines to promote WUE.

✓ Creation of WUA Information System[1,2] in National Environment System[3].

✓ Pilot projects of WUE.

✓ Inclusion and articulation of efficient use and saving of water with the technical and regulatory instruments for planning and management of water resources.

[1] Programas para el Uso Eficiente y Ahorro del Agua (PUEAA)
[2] Sistema de Información del Recurso Hídrico (SIRH)
[3] Sistema de Información Ambiental de Colombia (SIAC)

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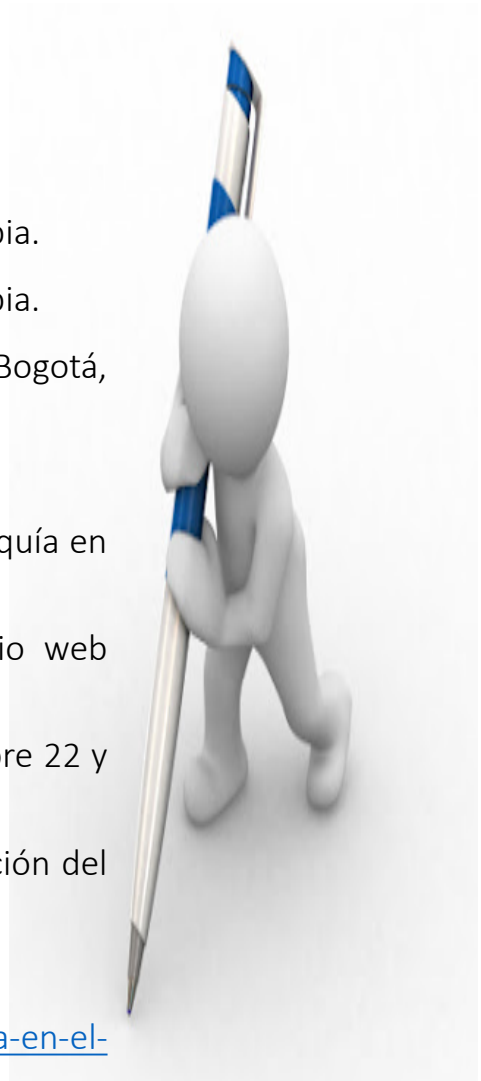

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