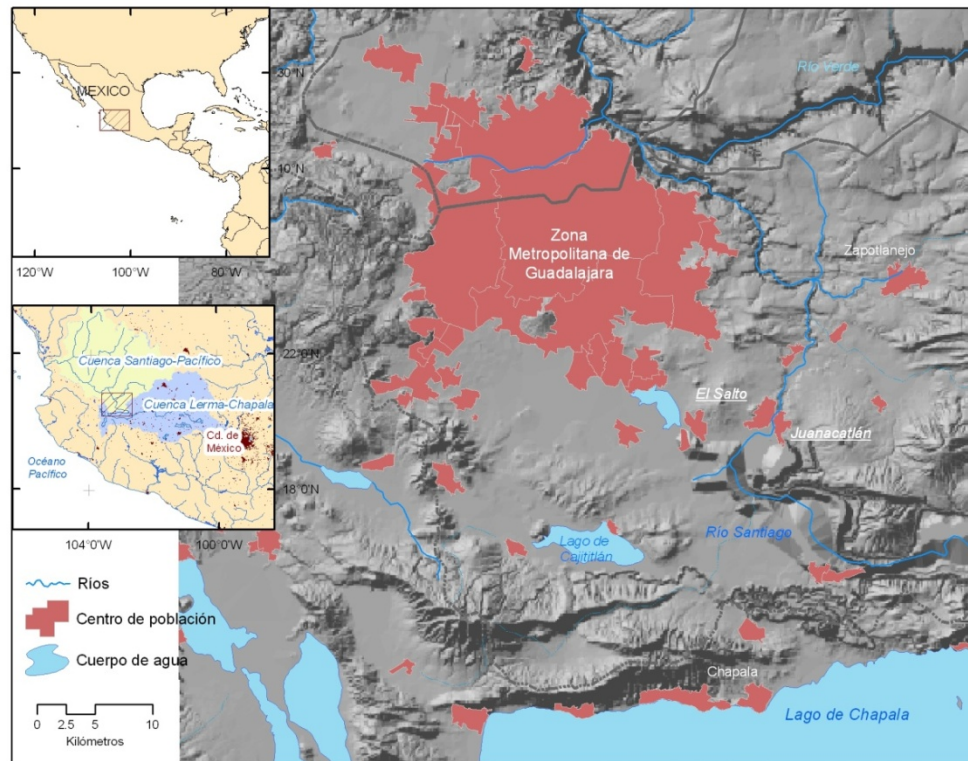


# Domestic Freshwater Usage Under the Final User Perception: Evaluation of the Metropolitan Zone of Guadalajara.

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Chair: Ecosystems and Environmental Informatics

- Context
- Goal of the survey
- Problems
- Sampling method
- Results
- Conclusions

- The city of Guadalajara is the second biggest city in Mexico and the third in economic importance; it is located in the west side of the country.



# The Metropolitan Zone of Guadalajara (MZG)



- Population: 4,095,853 inhabitants
- Surface: 544.7 Km<sup>2</sup>
- Total fresh water supply of 9,14 m<sup>3</sup>/sec

# Goal of the Survey



- To obtain a diagnosis of the population's perception about the water supply in the urban zone of Guadalajara, the conflicts that water management generates and the conscience level about water savings
- To have part of the bases in order to suggest new strategies to sensitize the people more about the water problematic in the MZG

# Problems



- The sustainability of freshwater resources is a key factor to preserve the freshwater sources to which human beings depend.
- The city of Guadalajara is far from being considered a sustainable city in its freshwater resources. According to SIAPA (the governmental water supply company in Guadalajara) the water consumption per capita is around 214 L/d.
- The water usage per capita in a sustainable city should be about 150 L/d.

# Problems



- The absence of conscience about the water problems, and the apathy or lack of will of the final users to save the water resources can be the causes that prevent achievement of the sustainability of the freshwater resources.
- In Guadalajara, 70% of the water is consumed by the households, therefore, to create a responsible and rational use of water can be the engine to reach a sustainable freshwater consumption.

# Sampling



- The sampling method performed was a simple random sampling of sets.
  - Each set has an area of 0.346 Km<sup>2</sup> of the MZG.
  - Inside each set, 5 houses were surveyed.



# Sample Size



- Universe: 914,024 Houses.
  - Upper Socio-economical Class (A/B) 8%
  - Middle Socio-economical Class (C) 34,7%
  - Lower Socio-economical Class (D) 50,6%
  - Marginal Socio-economical Class (E) 6.7%
- Sample size 300 houses (60 sets)

# Representative Proofing of the Sample Size



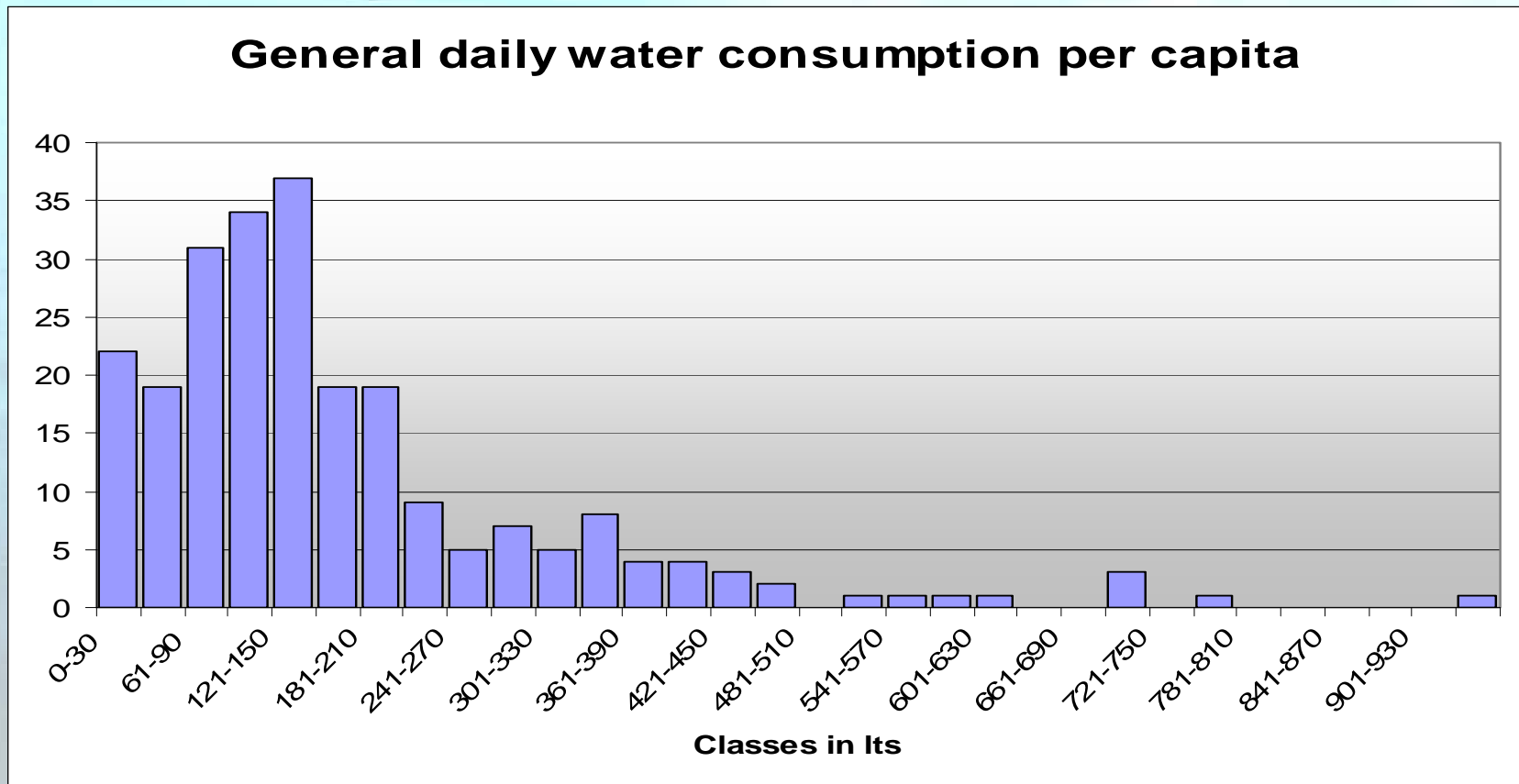
<i>Variable</i>	<i>Survey data</i>	<i>INEGI 2005 pop counting data</i>
Inhabitants P/House average	4,28	4,48
Rooms P/Inhabitant average	1,06	1
% of houses with wash machine	89%	84%
% of houses with WC	100%	98%
% of houses with water connexion	95%	94%

<i>Variable</i>	<i>Survey data</i>	<i>AMAI 2005 Data</i>
%Class A/B	7%	8%
%Class C	37%	34,70%
%Class D	52,7%	50,60%
%Class E	3,30%	6,70%

The variables inhabitants per house and rooms per inhabitant presented a confidence interval of 97,5% and 90% respectively, and the socio-economical distribution from the survey showed it belonged to the AMAI's socio-economic distribution with a significance level of 5% ( $\alpha=0,05$ ) and degree of freedom of 3. 10

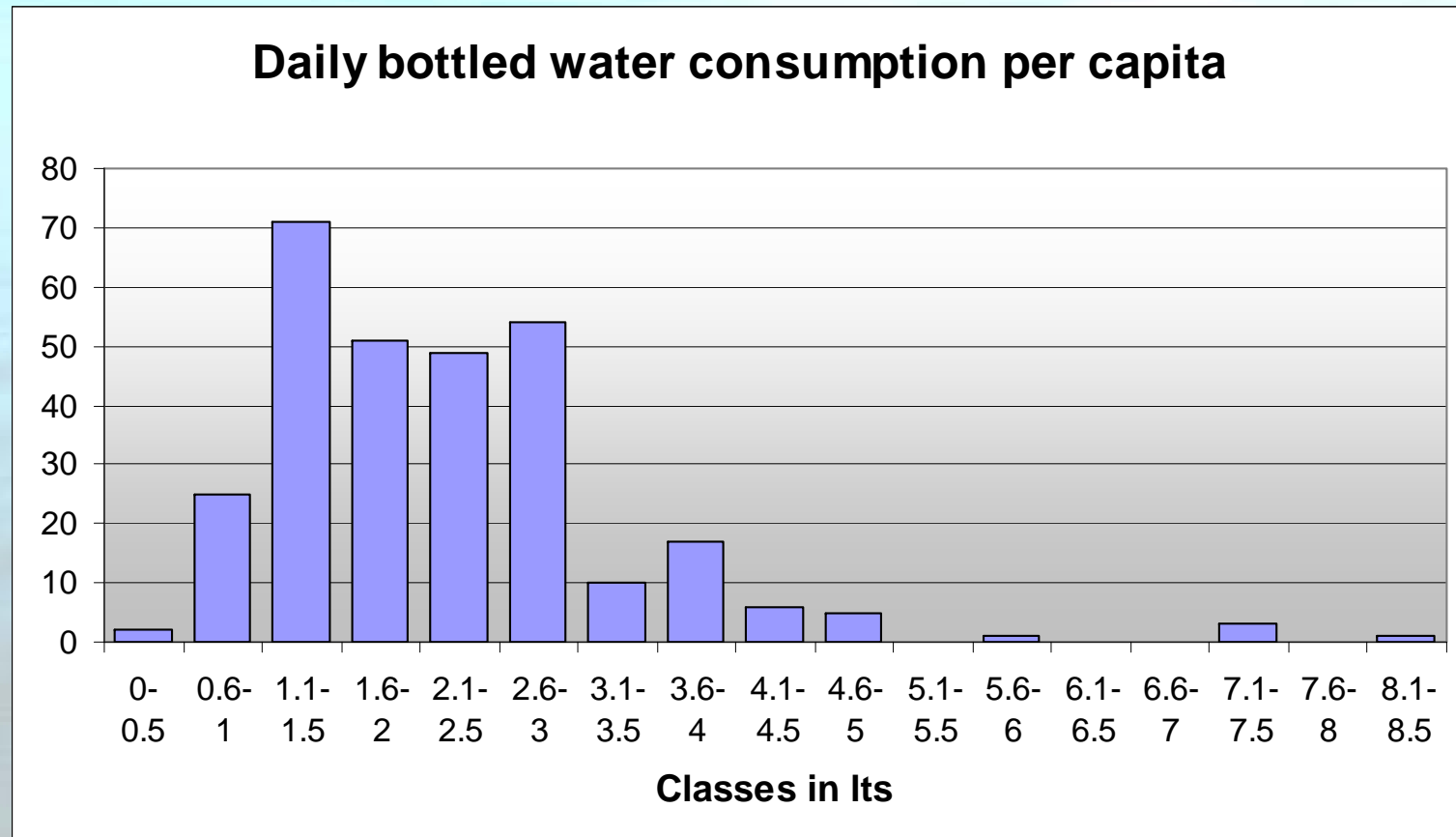
# Daily Water Consumption per Capita



- Avg = 169.23 lts
- Skewness = 2,04

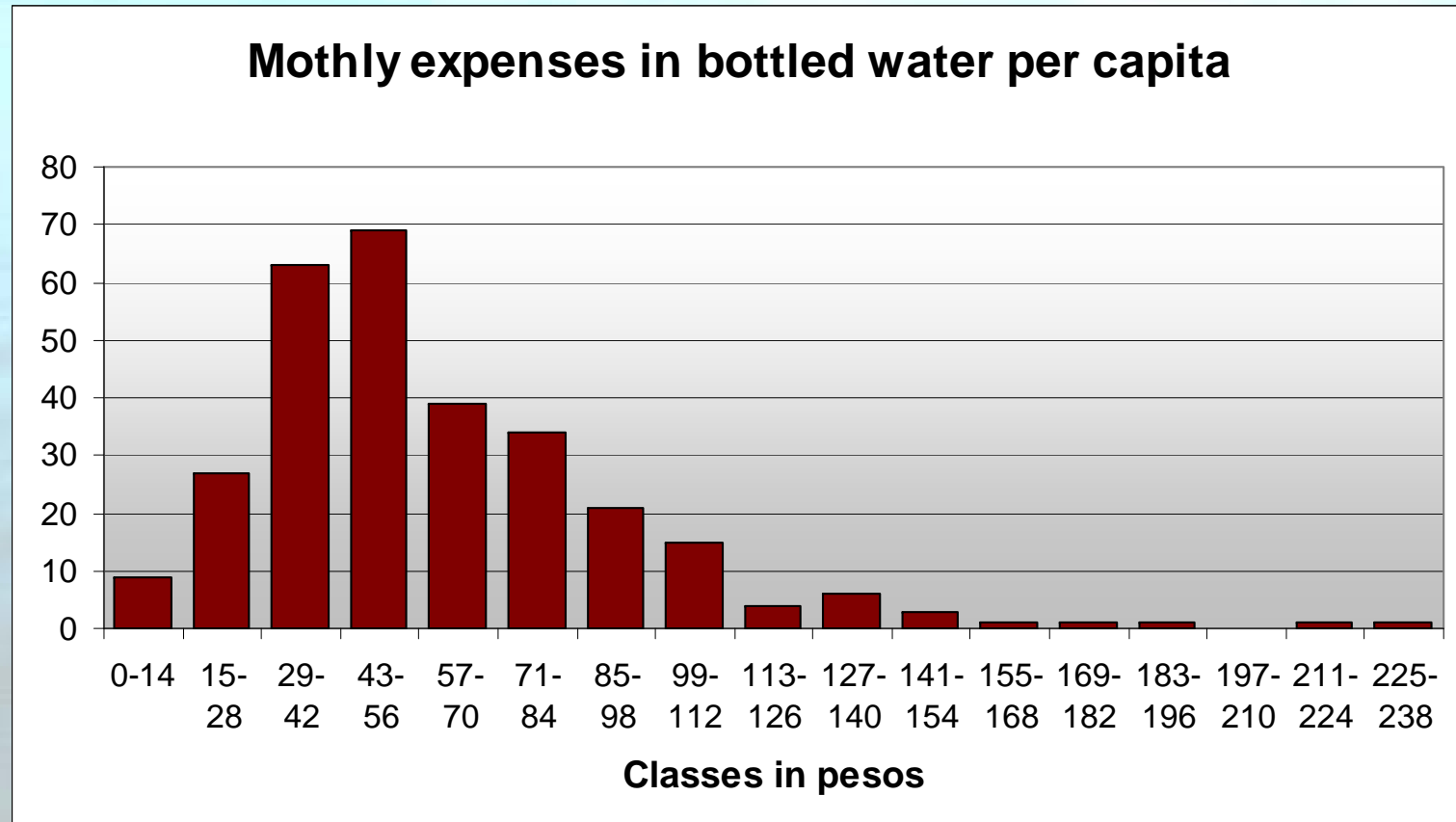
\* Average daily domestic water consumption per capita in Berlin: 115 lts. 11

# Daily Bottled Water Consumption per Capita



- Avg = 2.23 Its
- Skewness = 1,76

# Monthly Expenses in Bottled Water per Capita



- Avg = 59.3 pesos (3.7% of minimum wage)/ 3.14 € • Skewness: 1,65

\*Monthly minimum wage in Guadalajara: 1597.8 pesos

# Results: Survey Overview

Only Cistern	Only Water tank	Both	None
98	26	151	25
32,67%	8,67%	50,33%	8,33%

WC with tank	WC without tank
280	20
93%	7%

- There are on average 2.03 WCs per house, giving a total 568 complete WCs. From these 568 WCs, 339 (59.7%) have a 6 liter tank or less; 211 (37.2%) have a tank with more capacity than 6 liters, and 18, without information.

# Results:

## Water Saving Conscience

- 53% (160) of the users surveyed mentioned they use at least one method to save water.
- 47% (140) do not use any method to save water.

<i>Method</i>	
To reuse the water of the wash machine	79
To reuse the moping water	20
To reuse the water in general	20

# Results:

## Water Saving Devices

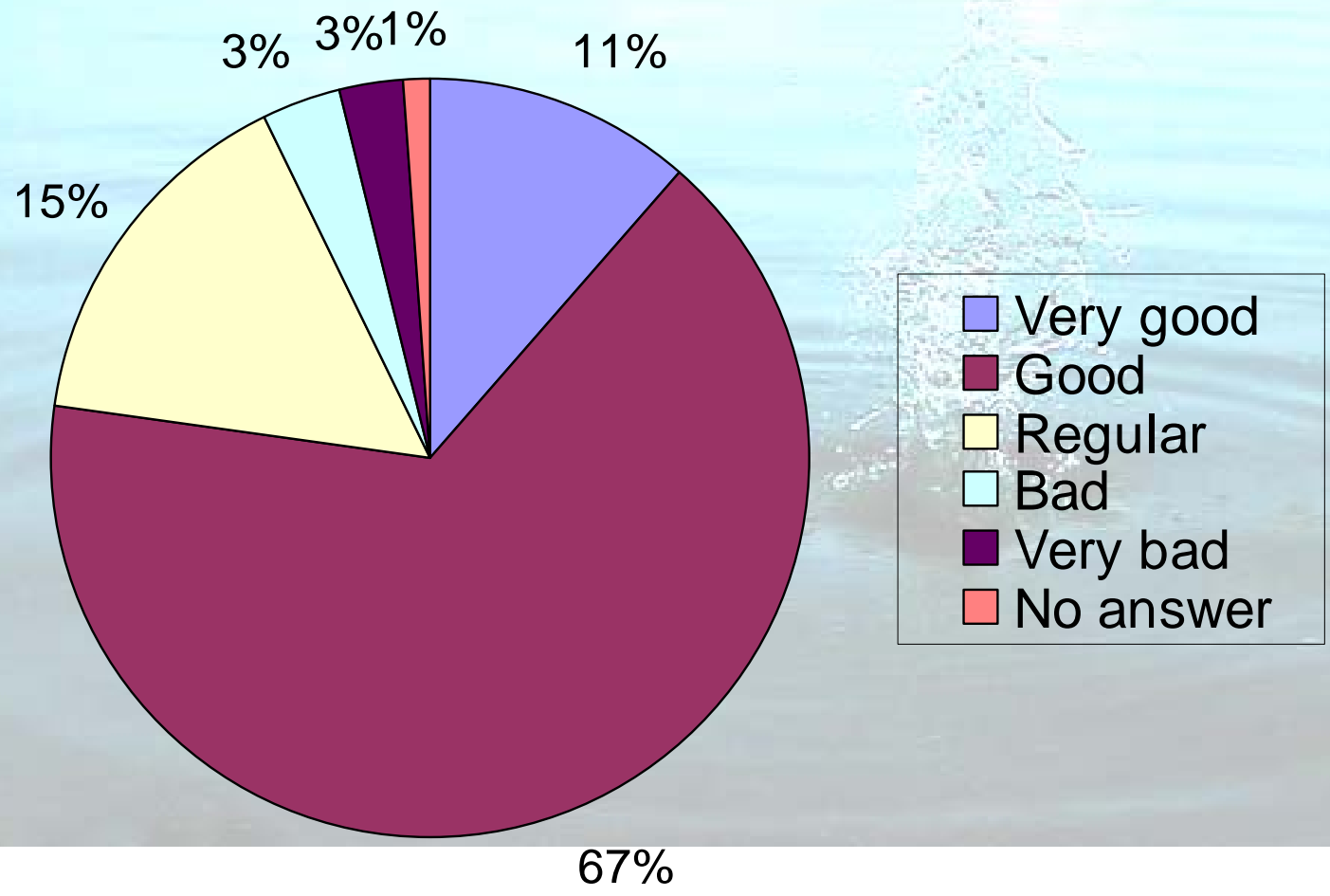
- 72% (216) of the users surveyed do not possess any water saving device.
- 18% (84) possess at least one water saving device.



# Perception About the Potable Water Supply Service



## Water supply service perception



# Perception About the Potable Water Supply Service



## Very good

The water is never missing	25
Good water quality	3

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## Good

The water is never missing	127
Almost the water is never missing & occasional cuttings	34

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# Perception About the Potable Water Supply Service



## Regular

Cuttings & Occasional lack of water	27
Regular or bad water quality	8

## Bad

Lack of water & Water cuttings	6
Lack of service	1

## Very bad

Lack of water & Water cuttings	9
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# Results:

## Water Problem in the MZG



Do you believe there exists a water problem in the city of Guadalajara? Why?

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<b>Yes</b>	<b>No</b>	<b>Don't Know</b>
74,33%	22,00%	3,67%

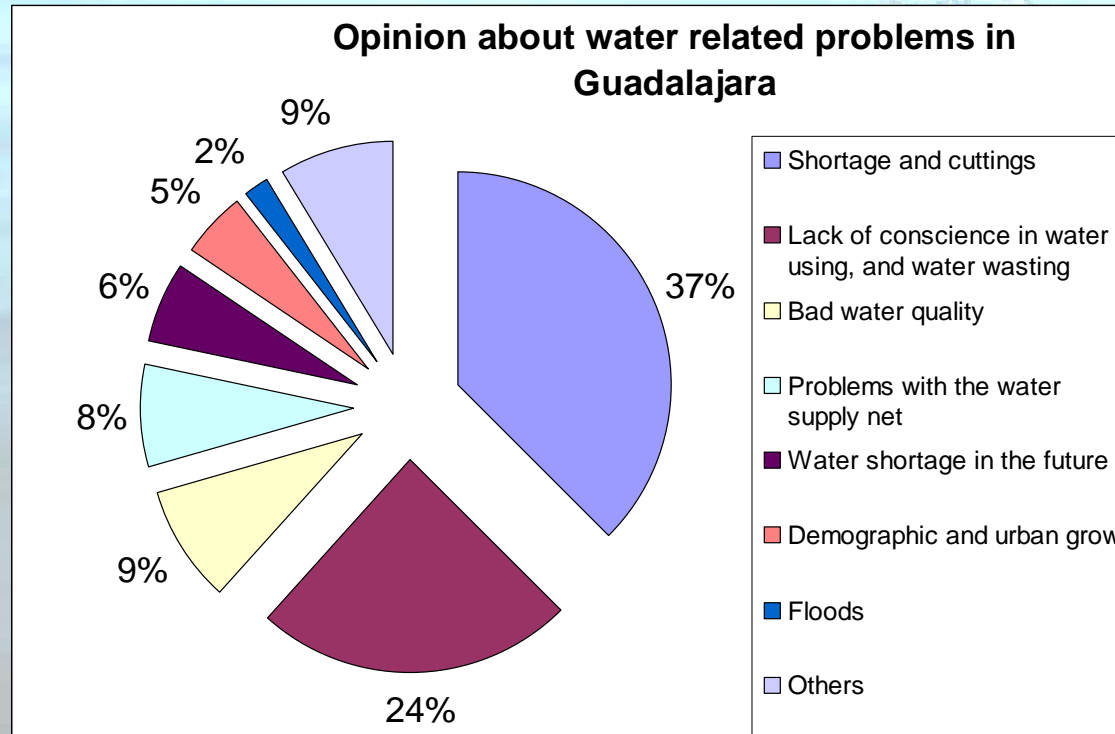
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# Results:

## Water Problem in the MZG



- For the people that consider a general problem with the water in the MZG exists, the most mentioned causes were:



# Citizen Associations in Support of water ?



- The users were asked about their knowledge of citizen associations in support of water improvement. 94% (282) of the surveyed users do not know any group or association, and the 6% (18) gave an affirmative answer.

## Associations

Settler associations	7
Religious, scholar or other groups	4
Directive board or commissions in the neighborhood	4
Neighbors	3
Others	3

- A drastic modification in water use behaviour is necessary.
- To improve water quality, particularly if the water is used for drinking purposes.
- It is crucial that the citizens are well informed about the factors and problems related to the governmental water supply system.
- It is necessary that the mission and agenda of civic organizations are promoted in a more efficient way.

Thanks