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PROMOTING RAINWATER HARVESTING FOR WATER SUPPLY



**Coordinación de Hidráulica
Subcoordinación de Tecnología Apropriada e Industrial**

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SEMARNAT



PROMOTING RAINWATER HARVESTING FOR WATER SUPPLY

Needs / Motivation

In 2005 the rural population in Mexico was 24.3 million persons, about 8 million (31.8 %) were lacking service drinkable water. The degree of dispersion of the communities as well as economic factors are the principal reasons that impede to provide them with these services.

CONAGUA, 2006





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Unimproved drinking water sources



Unprotected dug well

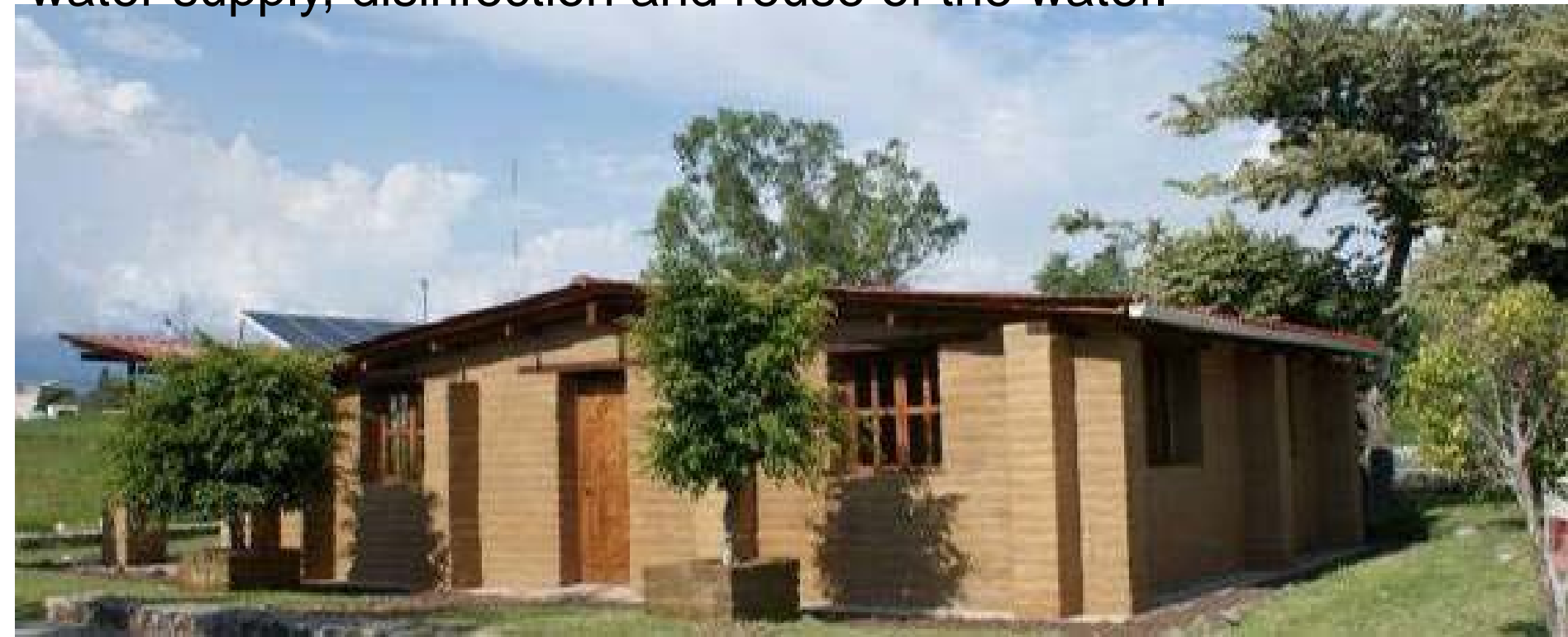


Surface water (river, dam, lake, pond, stream, irrigation channels)



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For several years, the Mexican Institute of Technology of the Water (IMTA) has investigated, developed, adapted and transferred a series of appropriate technologies forming a package that in an integral way there solve the problems of water supply, disinfection and reuse of the water.





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Project's aim

To provide water for families in rural, indigenous zones and periurban isolated areas to cover basic water needs.





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Materials and methods

- The house has been designed with the dimensions for a rural family of five inhabitants in average.
- The materials of construction more common in these zones as the "adobe" have been used.
- The technologies adapted for the captation, conduction, storage, disinfection and utilization of the water of rain have been implemented.



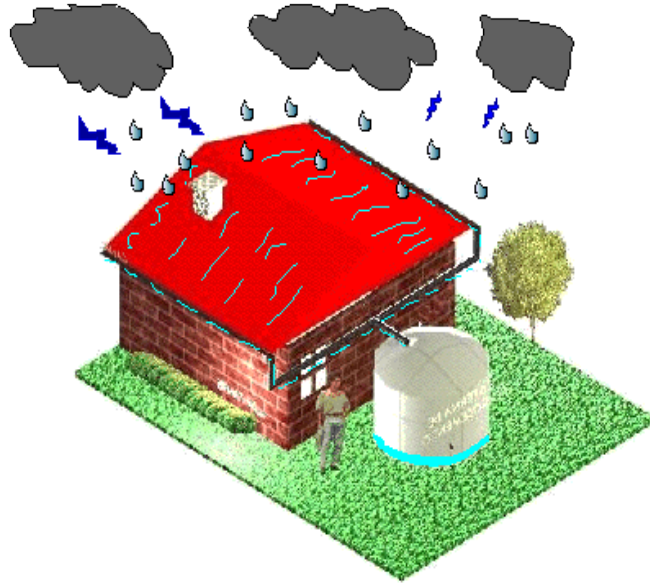
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Materials and methods

- To find the optimum catchment area and storage tank size which will help reaching a certain reliability of supply, the following should be considered: the mean annual rainfall, water requirement (about 45 liter/person/day), characteristics of the catchment area such as size and material type and number of benefited persons



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- Catchment area (house roof).
- Conveyance system (guttering, downspouts and piping) .
- Screening.
- Storage (cistern).
- Distribution



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Catchment area (house roof)





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Conveyance system (guttering, downspouts and piping)





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Screening

A leaf screen over the gutter and at the top of the downspout is helpful





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Storage (cistern)

The storage tank is localized above ground, has a capacity of 50 m³ and has a cover to prevent mosquito breeding and algae growth from contact with sunlight.





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Distribution





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Distribution





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Number of cisterns of different capacities

Estate	Transferred
Michoacán	358
Chiapas	10
San Luis Potosí	83
Guerrero	29
Zacatecas	10
Estado de México	15
Morelos	2

All communities have a population under 2,500 inhabitants



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Water supply. Pockchich, San Antonio, San Luis Potosí



Total capacity of the cistern: 50,000 liters



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Water supply. Santa Martha, San Antonio, San Luis Potosí



Total capacity of the cistern: 50,000 liters



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Water supply. El May, Tanlajás, San Luis Potosí



Total capacity of the cistern: 50,000 liters



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Water supply. Cacahuatepec, José Joaquín Herrera, Guerrero



Total capacity of the cistern: 50,000 liters



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Water supply. Arocutin, Erongarícuaro, Michoacán



Total capacity of the cistern: 100,000 liters



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Water supply. Napizaro, Erongarícuaro, Michoacán



Total capacity of the cistern: 100,000 liters



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Designing a New Irrigation System



Total capacity of the storage tank: 200 liters



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Designing a New Irrigation System



Total capacity of the storage tank: 10,000 – 20,000 liters



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Designing a new irrigation system



Area of irrigation: 90 ha
Approximate efficiency of 75%.



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Conclusions

- Water supply all the year round (depending on the use), diminishing the need to transport or buy the water.
- The water consumption of superficial or underground sources is diminished.
- The technologies are of low cost, for example a commercial cistern of plastic of 10,000 liters costs more than US\$830, the cost of the cistern “capuchina” is minor to US\$347 (considering only the cost of materials).



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