Con el apoyo de la Alianza

WWF | Fundación Gonzalo Río Arronte, I.A.P. | CONAGUA Comisión Nacional del Agua

WATER RESERVES PROGRAM

A strategy for adaptation to climate change

The Alliance WWF–Gonzalo Río Arronte Foundation I.A.P. (FGRA), together with the National Water Commission (CONAGUA), identified 189 river basins in Mexico with water availability, biological wealth (high biological richness and conservation values), and low pressure from water users, which present favorable or potential conditions for establishing water reserves to ensure ecological protection in terms of the National Water Law.

A WATER RESERVE REPRESENTS THE VOLUME OF THE NATIONAL WATERS TO BE RESERVED FOR ENVIRONMENTAL PURPOSE, AND WHOSE OBJECTIVE IS TO GUARANTEE THE MINIMUM FLOWS FOR ECOLOGICAL PROTECTION, INCLUDING CONSERVATION OR RESTORATION OF VITAL ECOSYSTEMS (NATIONAL WATER LAW, ARTICLE 41)

The set of potential water reserves includes all hydrological regiones, terrestrial and freshwater epicontinetal eco-regions in the country in order to ensure the resilience of both ecosystems and society in the face of situations of scarcity.

With the help of a Geographic Information System (GIS) (Figure 1), 189 river basins with feasible conditions to establish water reserves were identified (Figure 2) in the context of a National Water Reserves Program, whose main goals are:

i) To establish a national system of water reserves

ii) To demonstrate the benefits of water reserves as instruments to ensure a healthy functioning of the water cycle, as well as the environmental services they provide

iii) To strengthen capacity for the implementation of Mexican Ecological Flow Standards, backed by official national guidelines (NMx) throughout the country

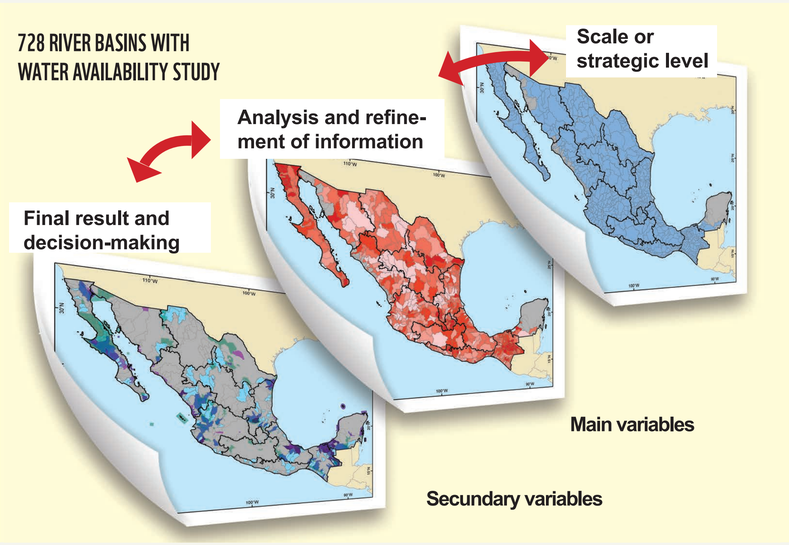

Figure 1. GIS conceptual model

Benefits of the water reserves:

- Definition of sustainable limits on water availability, which foster the principle of saving water and managing the demand placed on this resource, and thus reducing risk from water scarcity and conflicts
- Guarantee the connectivity of the entire basin and to conserve ecosystems and maintain environmental services such as storing, conducting and supplying water, improving water quality, and protection from extreme events
- Require integrated planning and management of both subterranean and surface water; especially relevant in regions with little surface water, such as in the north of the country
- Establish preservation or controlled release of peak flows which would improve the evacuation capacities of the basins, prevent the interruption of river channels, invasion of river beds, and thus decrease risks from extreme events
- Complement of the strategy for the conservation of the nation's most important ecosystems and their environmental benefits: 97 Natural Protected Areas, 55 Ramsar sites, and additional 78,500 km^2 of river basins

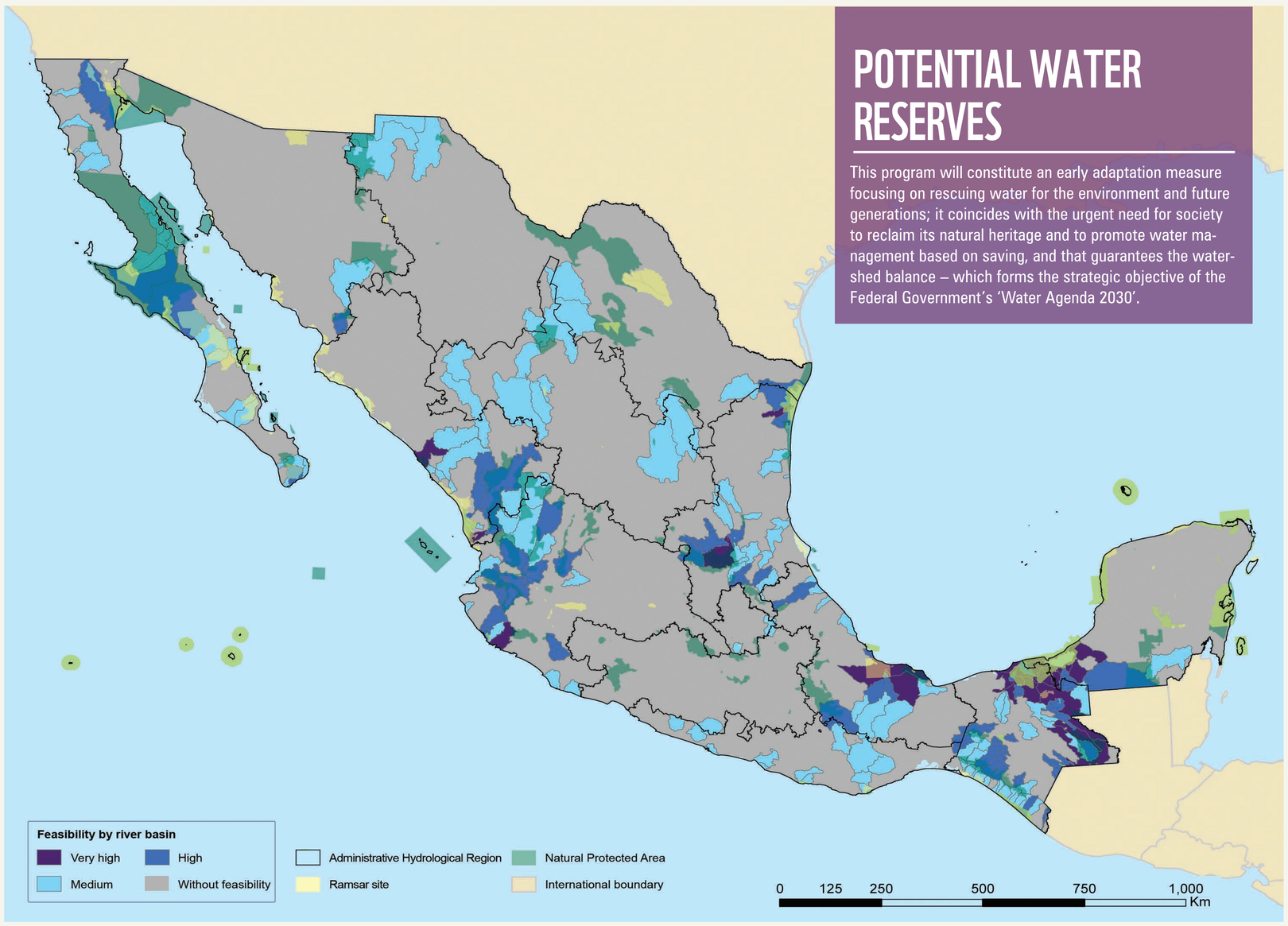

Figure 2. River basins with high probability for becoming designated water reserves

POTENTIAL WATER RESERVES

This program will constitute an early adaptation measure focusing on rescuing water for the environment and future generations; it coincides with the urgent need for society to reclaim its natural heritage and to promote water management based on saving, and that guarantees the watershed balance – which forms the strategic objective of the Federal Government's 'Water Agenda 2030'.

i. Background:

In recent years, the WWF–FGRA Alliance, in collaboration with the CONAGUA, has worked in the development of watershed environmental flow (e-flow) models and their feasibility of implementation in Mexico. The results show that it is feasible to estimate and establish a sustainable balance of water through an ecological flow that considers the different objectives of environmental conservation, social functions and degrees of demand for this resource.

ii. A GIS for potential water reserves identification:

The GIS constructed brings together the following key variables for watersheds:

- Availability of surface water
- Ecological importance or environmental merit
- Administrative restrictions for water extractions
- Water infrastructure
- Agricultural activities
- Groundwater
- Population density

Each variable has its own information that all together constitutes a data base with more than 45 sub-variables (Figure 3).

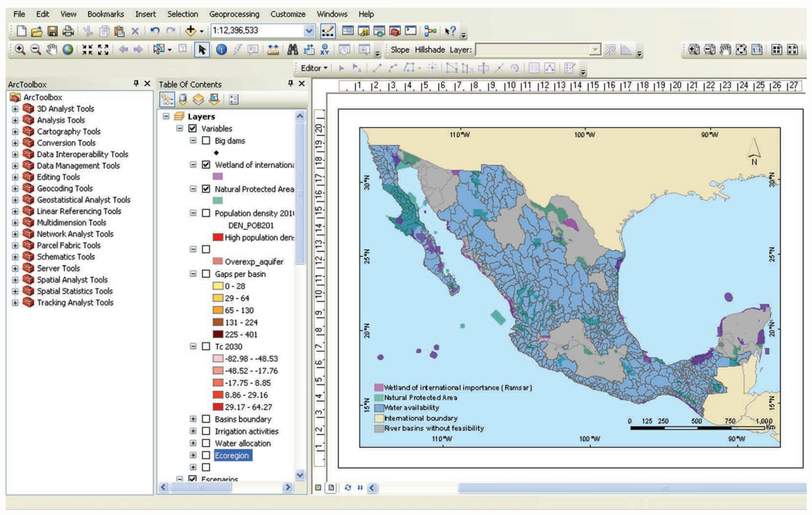

Figure 3. GIS layers display

iii. Instrumentation of the National Water Reserves Program

In the first year of activities, the strategy is focused on the creation of work groups to conduct justifying technical studies (e-flow and cost-effectiveness analysis) in pilot basins of the Program. The knowledge generated will feedback regarding experiences in the water reserves studies, at the same time, give technical-scientific support to the NMx (Figure 4).

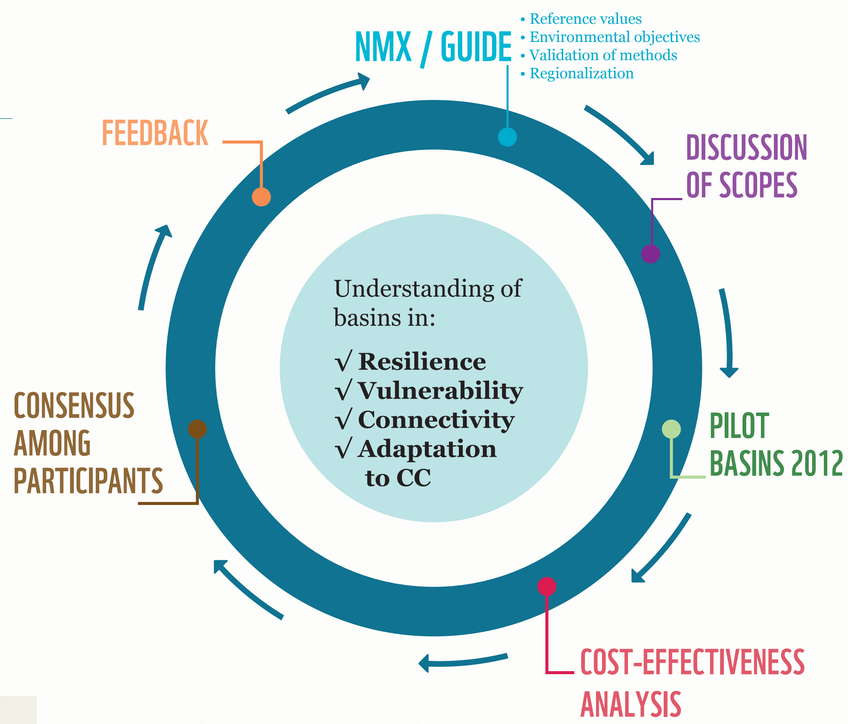

Figure 4. Conceptual model of 2012 Program activities

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Feasibility study and GIS available at:
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- www.wwf.org.mx