Shared Groundwater Resources for Sustainable Development - SESSION FT 1.39

MANAGING TRANSBOUNDARY AQUIFERS AS A TOOL FOR ENVIRONMENT STRESS-REDUCTION AND POVERTY ALLEVIATION: TWO EXAMPLES FROM THE AMERICAS

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A regional initiative of UNESCO/IHP in collaboration with the General Secretariat of the OAS, launched during the IAH/ALHSUD Congress of Mar del Plata, Argentina, 2002.

Objectives:

i) Improve the scientific, environmental, legal and institutional understanding of the transboundary groundwater resources of the hemisphere.

ii) Produce an Inventory of Transboundary Aquifers of the Americas.

iii) Identify priority case studies for the implementation of pilot projects.
Results so far achieved:

• Active participation of 25 countries and creation of a network of National Coordinators

• Identification of 68 transboundary aquifers: 29 in South America; 18 in Central America; 4 in the Caribbean (Haiti-Dominican Rep.); 17 in North America (Ca-USA-MX)

• Agreement on Case-studies
Agreement was reached among the countries on the definition of the list of transboundary aquifers suitable for the possible implementation of pilot projects (Montevideo, April 2004). The OAS and UNESCO are now actively promoting the implementation of an initial set of pilot projects, including major transboundary aquifers.
Summary of Case Studies

- The Toba-Yrenda’-Tarijeno sub-project of the Plata Basin FP (Argentina, Bolivia, Paraguay) GEF-UNEP-OAS-UNESCO

- Rio Negro Aquifer (Honduras, Nicaragua)

- Ostua - Metapan Aquifer (Guatemala, El Salvador)

- Zarumilla - Machala Aquifer (Peru’, Ecuador)

Advanced preparation

Early preparation

Concepts
Groundwater of the Pantanal Aquifer interacts with surface water creating the conditions for the existence and survival of the Pantanal Wetland. Its high vulnerability to contamination, excess siltation and over-exploitation will require urgent joint actions by the countries sharing the aquifer, and the Pantanal.

**Actions**
- Create a joint committee - GDE Committee
- Reach a common understanding of the system and its interactions with surface waters
- Design and implement a monitoring network
- Identify threats and possible protection - remedial actions
- Establish policies and permanent management structures
The Rio Negro aquifer shared by Honduras and Nicaragua, is the only source of safe drinking water in this border region. It also sustains coastal ecosystems, and livelihoods.

This shallow unconfined aquifer is threatened by agricultural pollution, and domestic discharges.

ISARM Pilot Project
Ostua - Metapan Aquifer shared by El Salvador and Guatemala

Part of the Upper Rio Lempa basin, the aquifer flows from Guatemala to El Salvador, and provides water for agriculture and domestic uses (Guatemala) and industry (El Salvador). Highly vulnerable to contamination.

ISARM Pilot Project
The Zarumilla - Machala Aquifer shared by Peru’ and Ecuador

It is the major local water source during the dry season. Its hydrogeology is well known, but management systems, as well as protection measures, are lacking.
Sustainable Management of Transboundary Aquifers in the Americas

Reducing Environmental Stresses and Alleviating Poverty

In the Central Region of Hispaniola, along the border zone between Haiti and the Dominican Republic, accelerated erosion and runoff in the upper reaches of the Artibonito Basin are causing loss of lives, and environmental collapse.

In the semi-arid Chaco Plains, water scarcity and growing salinization of groundwater, combined with increased frequency of extreme climatic events, are hindering development and threatening the Chaco freshwater ecosystems.
Promoting the Sustainable and Strategic Utilization of the Transboundary Groundwaters of Hispaniola: the Artibonito Intermountain Aquifer

OBJECTIVES:
- Enhance recharge and reduce solid transport and runoff
- Expand resource base (deeper aquifers)
Geology of the Artibonito Aquifer System

- **Shallow aquifers under exploitation**
- **Possible deeper aquifers**

**Alluvial sediments,**
Upper Tertiary sediments
Impermeable cover, with isolated aquifers
Unknown thickness

Carbonatic sequence (Cretaceous - Oligocene) with high fracture permeability. Possible major water reserves.

**Igneous rocks?**

- **Recharge area**
- **Exploitation area**
- **Recharge area**
Pilot demonstrations: MAR

Activities:

Creation of joint management mechanisms and institutions

Facilitation of agreement on causes of degradation and possible solutions (TDA-SAP)

Pilot Demonstrations
Plata Basin: the Yrenda – Toba – Tarijeño Transboundary Aquifer System
Argentina, Bolivia, Paraguay - ISARM case-study

Objectives of the groundwater component:
Assist countries in the assessment, protection and sustainable management of the transboundary aquifers of the basin.

Regional/Global Benefits:
Protection of the transboundary groundwater resources and of groundwater dependent ecosystems.

Mitigation of and adaptation to the impacts of climatic fluctuations and change.

Local Benefits:
Integrated sustainable management of groundwater resources for multiple purposes (domestic, agriculture, environment).
In the Chaco plains, groundwater from the recharge areas in the Andes foothills intrudes the saline groundwater of the plain creating a complex aquifer system. It is the only, highly vulnerable source of freshwater for local populations, and sustains the Chaco humid zones.
The challenges:

Reach a common understanding of this shared resource

Introduce joint management mechanisms

Protect recharge areas

Enhance exploitation of deeper levels

Promote managed aquifer recharge as a mitigation measure of extreme climatic events

Establish the aquifer as a regional demonstration for replication in the whole Plata Basin
Thank you
Gracias

Programa UNESCO/OAS ISARM Americas:

http://www.oas.org/dsd
http://www.unesco.org/water/ihp