

UNESCO-OAS ISARM AMERICAS PROGRAMME

Questionnaire #3

Sustainable Socioeconomic and Environmental Aspects of Transboundary Aquifers

The ISARM Programme Framework document sets out five focal areas of concern when dealing with transboundary aquifers. In the course of the ISARM Americas programme information has so far been collected by the Countries of the region on three of these focal areas: scientific aspects of transboundary aquifers and the legal and the institutional frameworks in the course of the past few years. The last two focal areas have been combined, to address the socio-economic and environmental aspects. Assessment of the current trends in environmental actions suggests that this approach is more appropriate.

Responding to these trends the following survey collects basic socioeconomic and environmental information that will help to define a region assessment for the sustainable management of the transboundary aquifer systems of the hemisphere. This combined focal area of ISARM addresses the interactions and interdependencies between human communities, natural ecosystems, and the transboundary aquifer systems. A consideration of these interactions and interdependencies will simultaneously help to develop instruments and tools that will sustain human development and preserve ecosystem services.

The survey includes two parts. PART 1 including detailed information to complete the questionnaire and PART 2 is the actual questionnaire.

EXPLANATORY NOTE:

The questionnaire relates to each of the *transboundary aquifers and the areas they cover* that have been identified in the Inventory compiled by the ISARM Americas Programme. The ref no.(i.e. 1N; 15S...) as used in the Inventory should be entered in the reference box.

QUESTIONNAIRE ON SOCIO-ECONOMIC & ENVIRONMENTAL ISSUES

AQUIFER Ref		
Country responding		

INSTRUCTIONS

PART 1:

To process this questionnaire, please visit the OAS [ftp://207.237.157.65/](http://207.237.157.65/) virtual site and find the folder “**Mapas A.T. Americas**” with all the final maps included in Volume I of the UNESCO-OAS ISARM-Americas Series.

In order to fill out Questionnaire No. 3 please extract information from Questionnaire No. 1 (i.e. from the Hydrogeological Data form), if still valid.

Using the relevant aquifer map please identify the recharge and discharge areas to the extent possible and draw them with **black dots pattern and the initial capital R and D in black.**

From the socio-economic and environmental point of view the key “management” areas in aquifers are on their recharge and discharge areas, so they need to be identified, as far as possible, on the map. This will also help in a clearer understanding of some of the responses to the questions.

PART 2: PLEASE FILL OUT THE FOLLOWING QUESTIONNAIRE AND TRANSFER RELEVANT DATA TO MAP, IF POSSIBLE.

On the whole the questions that have been formulated below are based on the factors that contribute to the equitable and reasonable use of the transboundary aquifers. In responding to the questionnaire, some answers will be numerical and some narrative; if numerical, please enter the relevant numbers on the box on the right of the question. If narrative, please insert the response within the box with the question.

SOCIAL AND HUMAN ASPECTS

Human Populations

What is the size of the population dependent on the aquifer or aquifer system in your country and where is it located ? (How is it distributed?)	
What percentage is rural and what percentage is urban?	
Estimate population located in the recharge areas .	
Estimate population located in the discharge areas .	
What is the population annual growth rate?	
What are projected population increases/decreases over the next 30 years for urban communities?	
What are projected population increases/decreases over the next 30 years for rural communities?	
What percentage of the population is indigenous?	

Current water use from aquifers

Of the water currently withdrawn from the aquifer in your country, what proportion, in percentages, is used for : agribusiness, irrigation,	
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<p>domestic use, industry, and other uses? Specify: _____</p> <p>Please specify the percentage in recharge areas and the percentage in discharge areas, if known. (If proportions are not known, simply indicate priorities. If priorities are unknown then simply identify whether use exists or not.)</p>	
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PHYSICAL ISSUES AFFECTING TRANSBOUNDARY AQUIFERS

Current & expected climatic issues affecting the transboundary aquifer areas

<p>What have been the changes in the quantity, intensity and periodicity of rainfall over the aquifer in the last decade? Percentual changes can be used.</p> <p>Have they had any impact on the recharge patterns? If so, what impacts are expected?</p>	
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<p>What are the expected rainfall changes in the future two decades?</p> <p>Are there any expected changes in recharge patterns? If so, what are the expected changes?</p>	
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<p>What is the impact on the aquifer of extreme events (floods, droughts, earthquakes)? (is there any plan for the development of the aquifer, particularly during drought periods?)</p>	
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<p>What use is done of the aquifer during and/or after extreme events?</p>	
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The 'water' in the transboundary aquifers

<p>What widespread (not localized) changes have been noticed in the availability and quality of water in the aquifer?</p>	
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<ul style="list-style-type: none"> -Increasing/Declining water table? -Nutrient contamination? -Microbiological contamination? -Chemical contamination? -Color, odors and/or taste? -Change in Salinity? -Disease? -Other? 	
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<p>In the case of present or future (possible) high extraction or contamination of aquifers, what other alternative water sources are available?</p>	
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Are they transboundary or purely national in nature?	
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LAND USE & LAND MANAGEMENT ISSUES

If possible, define what 'landscape' units are found in the area of the transboundary aquifer (ie, productive, natural lands, urban, aquatic, etc)	
What was the original (pre-development) natural land cover above the aquifer?	
What is the current land cover/use above the aquifer? (including industrial use)	
<p>What is the cover/actual use above the aquifer (including industrial use)? If possible, please indicate on the map with circles or ellipses, and put a small-letter initial for use in red (such as agricultural: a; forest: f; industrial: i...)</p> <p>Specify <u>and provide the percentages</u> of: crops and cropping systems -industrial animal densities for industries and management systems (feedlots, pasture and dairy) -natural land cover/ecosystems (forests, grasslands, etc.)</p>	

WATER & LAND USE PLANNING & REGULATIONS

<p>Is (are) there any "plan/planes de ordenamiento territorial" for the area of the aquifer? (Attach or reference)</p> <p>If so, describe the plan or the predominant common features of the plans for the area of the aquifer.</p> <p>Is (are) any plan(s) being implemented?</p> <p>Will any components of the plan have an impact on recharge to the aquifers?</p>	
<p>Is there any "plan de manejo de recursos hidricos" for the area of the aquifer?</p> <p>If so, describe (attach/reference website) the plan for the area of the aquifer.</p>	

<p>Is this plan being implemented? If so, describe (attach/reference website) the plan for the area of the aquifer.</p> <p>Does this plan also include any measures that ensure that ‘infiltration’; of annual recharge is unaffected?</p>	
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<p>Do the “plan de ordenamiento territorial” and/or water management plan recognize ground water and/or include measures to maintain and enhance the recharge of the aquifer and sustainability?</p> <p>If so, describe.</p>	
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PROTECTED / CONSERVATION AREAS

<p>Indicate what protected areas are located on the aquifer (on the map, please use squares with the perimeter in green). Indicate areas with forest or soil conservation and/or restoration programs (big green dot).</p>	
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<p>Describe any important groundwater-dependent ecosystems fed by the aquifer. If possible, indicate them in the map with perimeter-in-blue squares and the ecosystems in blue capital initials):</p> <p>Lakes (L). Streams (S) Rivers (Ri) Wetlands (W) Ponds (P) Cyprus forests (CF) Wildlife watering zones (WZ) Bird flyways (BF)</p>	
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<p>Are there any streams / rivers / lakes (mentioned above) that receive important natural groundwater discharge from the transboundary aquifer, especially during dry periods?</p>	
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PLEASE ATTACH THE LEGEND USED

ECONOMIC BENEFITS DERIVED FROM THE USE OF TRANSBOUNDARY AQUIFERS

Taking into account the land use and production from activities in the area of the transboundary aquifer, what is the economic benefit drawn from the use of the water? Please quantify by converting to U.S. dollars.	
How is the local economy (agriculture / industry /natural resources - biodiversity) dependent on the access to the resource water?	
What is a percentual estimate of the poverty level of the populations that use the water resources of the aquifers? (Please also provide the average incomes in U.S. dollars.)	
Taking into account the groundwater-dependent ecosystems that use the discharge of the water from the aquifer, what livelihoods (economic losses) would be at threat, if the aquifer system were impacted negatively?	

COMPETITION FOR WATER RESOURCES IN THE TRANSBOUNDARY AQUIFERS

<p>How many interactions (official or non official discussions, treaty, etc.) related to transboundary aquifers has taken place in the last 20 years? How many of them are based on mutual collaboration?</p> <p>How many of them are based on competition?</p>	
<p>Is there competition with your neighboring countries for the use of the aquifer?</p> <p>What triggered the competition?</p> <p>When did the competition start?</p> <p>If there is competition, what efforts are being done to address it?</p>	
Is there cooperation with your neighboring countries in the aquifer usage?	
What is being done:	
a) To <u>anticipate</u> possible escalation of the competition?	

b) To <u>prevent</u> the development of competition?	
c) To <u>improve</u> existing cooperation?	

THANK YOU FOR YOUR TIME AND EFFORT!!