Water scarcity in Jordan River Basin

Project Rationale

Water scarcity imposes a serious constraint on the socio-economic development of the countries of the Jordan river basin, causing fierce competition between the agricultural and fast-growing urban sectors as well as exacerbating tension in a region already rife with political conflict. This tension is likely to mount in the near future under persistent demographic pressure and worsening rainfall conditions due to climate change. Political conflicts in the region prevent effective inter-basin transfer, and desalination technology is not yet viable. Consequently, vast data collection and monitoring exercises have been initiated in the last decade by natural resource centres, as a basis for further research activities towards solving this problem.

However, effective policy cannot be formulated solely by expanding socio-economic and biophysical databases. In particular, two major problems have impeded an effective sharing of the region's water resources. The first problem can be attributed to a lack of awareness of the cross-border impacts of water use, and the lack of mechanisms for resolving the ensuing conflicts. Particularly crucial here are the negative impacts of upstream (or above ground) land and water use in one country on the downstream (or ground) water resources of another. The second problem is the limited research capacity available in the region's water resource centres. Taken together with the lack of coordination, these problems hinder the pursuit of joint initiatives for promoting economically efficient and ecologically sustainable water allocation.

This project attempts to address the above problems by developing a framework for the ***concerted sharing*** of water resources in the Jordan river basin.

Objective

The project's main objective is to enhance the coordinated research capacity of the region's water resource centres. In particular it aims to improve regional water specialists' understanding of the political and physical processes that influence water resource management in their neighbouring countries. The regional water model described below lays down the foundation for this collaboration. It has been designed by a multidisciplinary team of water specialists, natural resource experts and economists from Jordan, the Palestinian territories and Lebanon, as well as a regional research centre. Research institutions of partner countries will be able to use this mathematical water economy model for making projections of water use and needs, environmental forecasts, socio-economic impacts and other policy issues.

A Regional Water Model

The spatially explicit regional water model has a link-node structure consisting of links between source nodes (upstream areas, reservoirs and aquifers) and sink nodes or demand sites in the agricultural, industrial, hydropower, municipal and domestic sectors. Administrative districts or sub-districts are the

analysis units of the map, which is composed of three layers, representing surface, root zone and ground water resources respectively. The hydrological flow model is supplemented with data on water-related economic activities occurring per district. These include all activities that generate revenue or economic welfare, for example agricultural production, tourism, domestic use and municipal activities like park maintenance.

The model can thus quantify the welfare gains of cooperation between countries, a special feature that distinguishes it from other policy tools in the region. It equips decision makers and negotiators with the knowhow for evaluating the implications of various scenarios for concerted water management in physical as well as economic terms. Another innovative aspect of the model is that it simultaneously tracks the flow of pollutants dissolved in the water, and can thereby incorporate the costs of deploying desalination and wastewater treatment techniques for meeting quality standards.

A wide and exhaustive database is being constructed in conjunction with model development. This includes data on climatic factors, watersheds and aquifers, spatial data on land and water use and resources, as well as socio-economic data in order to differentiate between income groups according to their water demand and response to water prices. Zonal maps of water consumption versus available water resources are also being developed.

The completed water model will serve a variety of functions, including the identification and assessment of (i) 'hot spots' in the region that are highly dependent on water transfer from other areas, (ii) economic consequences of intra-national, cross-border and inter-basin transfers, (iii) economic implications of local groundwater depletion, (iv) economic feasibility of new desalinization and wastewater treatment plants and technologies, (v) impact of trends and policies on local ecosystems, (vi) impact of water policies on the poor and on gender-related issues, (vii) welfare effects under changing climatic conditions, and (viii) impact of climate change on the efficacy of current coping mechanisms that are the outcome of thousands of years of adaptation.

The Consortium

The consortium of this ambitious project consists of the following motivated and highly qualified project partners:

- Al-Quds University, Palestinian Territory
- American University of Beirut, Lebanon
- Centre for World Food Studies, The Netherlands (Lead Agency)
- Jordan University of Science and Technology, Jordan
- The Arab Center for the Studies of Arid Zones and Dry Lands, Regional Partner.

Project partners will focus their research activities on specific themes and jointly identify research topics that address cross-border water problems.

Project Phases

1. Getting started / data collection (5 months).
2. First version of model (6 months).
3. Data analysis / development of second version of model (8 months).
4. Policy scenarios.
5. Dissemination and outreach.

Chronogram

Activity / Months	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Kick-off workshop																										
Data collection/data harmonization																										
Training (Amsterdam)																										
Data collection/studies																										
Training in Region																										
Training (Amsterdam)																										
Website																										
Policy reports/thematic workshops																										
Reports writing/publications/presentations																										
Dissemination and outreach																										
Final workshop/Regional conference																										

Deliverables	a				b			c				d,e			f	g					h			i		j k,m
Benchmarks	A											B														C

Dissemination

A wide and well-targeted dissemination of the project's findings will be essential for building consensus on water resource management in the region. To this end the project will stay in regular contact with policy makers and stakeholders in the JRB via activities that solicit suggestions and feedback, and later on also to discuss outcomes and define practical policy options.

Contact information: info@concertedsharing.org

The project 'Towards Concerted Sharing' is sponsored by the Swedish International Development Cooperation Agency (Sida).

Sida

Co-sponsors and participants:

جامعة القدس
Al-Quds University

1866 AUB
American University of Beirut
الجامعة الأميركية في بيروت

Jordan University of Science and Technology

ACSAD

SOW-VU
Centre for World Food Studies
Stichting Onderzoek Wereldvoedselvoorziening