

Workshop on Sustainable Water Use Efficiency for Afghanistan
Funded by the US Agency for International Development
October 2, 3, 2008
New Mexico State University
Las Cruces, NM, USA

On October 2 and 3 2008 New Mexico State University hosted a workshop on sustainable water use efficiency for irrigation in Afghanistan. The workshop addressed challenges faced in the search for improving the development and use of irrigation water to support food security and improved livelihoods in Afghanistan. These challenges are magnified by recurrent drought, damaged irrigation infrastructure, and limited water storage faced by the Afghan people. The workshop focused on ways to bring modern science to bear on Afghanistan's agriculture and water challenges through the use of integrated river basin analysis.

OBJECTIVE OF AWATT

The main objective of the AWATT project with funding provided by USAID is to increase the opportunity for Afghans to access information and knowledge for appropriate technology for water use and agricultural production, to provide the tools and mechanisms for policy and institutional changes that enhance the management of the supply and demand of water resources, and to provide information that can lead to the development of a legislative framework for tenure and rights over private and common land in the rural areas.

The workshop assembled a group of experts in water resources and agriculture from NMSU. It also included participants from the AWATT Afghanistan office and from the project's partner institutions, including Colorado State University, University of Illinois, and Southern Illinois University. Experts from the European Commission to Afghanistan and the U.S. Geological Survey also participated.

Among these experts in water resource analysis and allocations were Dr. Ximing Cai, of the Hydrosystems Laboratory, Department of Civil and Environmental Engineering, University of Illinois at Urbana-Champaign who has published on policy options of balancing agricultural and environmental water needs. Some of Dr. Cai's work focuses on the need of irrigation water to address national food production needs based on simulations using an integrated global water food projections model. A second participant in the workshop Dr. Chris Goemans, has developed a regional water resource model that is capable of modeling the impacts of future population growth and increased climatic variability on water users throughout the South Platte River Basin. He has developed the South Platte Regional Assessment Tool to address regional water supply vulnerabilities in a coordinated way.

SPRAT models the allocation of water throughout the South Platte basin with respect to current physical, institutional, and environmental constraints, as well as under future scenarios that include population change, climatic variability, and changes to infrastructure. In addition to assessing vulnerabilities, the model provides a mechanism for exploring the potential benefits of various management options designed to reduce vulnerability.

For example, SPRAT can be used to obtain a better understanding of how future droughts of various lengths may affect water supplies and demand throughout the system, and can then assess the value of various coping strategies for mitigating the expected impacts. This assessment is not done at the scale of individual water systems, but rather at the scale of four South Platte sub-regions (Northern, Central, Southern, and Downstream).

A third model presented and discussed was that presented by Wolfgang Schmid and Randall Hanson called the Farm Process for MODFLOW (MF-FMP). This model allows the simulation, analysis, and management of all components of human and water use. It represents a complete hydrological model that links the movement and use of ground water, surface water, and imported water for water use of irrigated agriculture, but also of urban use and consumption by natural vegetation. Supply and demand components of water use are analyzed under demand-driven and supply-constrained conditions.

Several issues were raised by meeting attendees. Some of the more important are described below:

§ Whatever integrated policy support model is built should meet several criteria:

- § should fit Afghan cultures and policies
- § should be a useful tool for Afghans
- § should include maps and geo-referenced data
- § be an action oriented and policy driven

§ Mirabs are important water managers in Afghanistan. The null hypothesis is that current water allocation under the mirabs fails to produce the economically optimum crop and livestock production and farm income. The alternative hypothesis : current Mirab system achieves these objectives. If not what are the constraints? Are they institutional, household risk minimization. Do we lack information on the aims of the Mirab? Are the Mirab=s goals consistent with those of the water users?

§ Question: How can water and farm management in Afghanistan best be represented as a general maximization subject to measurable constraints?

§ There was a general agreement that we should avoid a black box approach. Terry Crawford suggested tying spreadsheets to model data read and model

output produced. The mission of AWATT is capacity building through a train-the-trainer approach.

§ Saud Amer described about 3000 existing observations on streamflows, about 2000 of which came from a country-wide sample , and another 1000 from initial water basin (catchment area) over sampling in target catchment area. Saud agreed to send us data to help us select catchment areas for initial analysis. We need to follow up on this.

§ General Data Issues

§ Jim Libbin agreed to use his expertise in designing data collection and analysis for the project

§ Phile Eberle agreed to examine current data available in Afghanistan regarding most common crops grown.

§ Terry Crawford noted that Afghanistan is 85% illiterate. Our mission is to implement water and land tenure effectively and sensitively. Outputs likely to require a simplified framework. We are results-oriented not model-oriented. Still, we still need to solve difficult problems rigorously, so we need a powerful model, a view supported by Saud Amer. Saud favors a national model that lets different regions pick out parts important to them.

§ Robert Foster noted that Balkh province is probably the safest place now. Afghanistan-Pakistan border less secure. Model work can be useful. Questions on rebuilding irrigation and how to manage water are big issues.

§ Randy Hanson: Suggests picking out a small area as a case study, a view supported by Steve Davies. Also suggests learning about cultural constraints and figuring out ways to quantify them.

§ Octavio Ramirez: suggests describing the questions that the model is supposed to answer. Also suggests examining alternatives to existing water law. We should learn the important policy debates to know how people think the law should change.

§ Saud: Suggests asking farmers if they're aware of a water law or policy. Then see if it's practiced. Ask farmers >are you happy with the policy or law=? What's an acceptable alternative to the status quo.

§ Randy: Steve Davies: suggests starting with a small sub-basin, get it working, then expand it.

- \$ Roger Beck: Our contact professor Aziz suggests trying to identifying different possible ways of allocating water, including a pricing mechanism.
- \$ Jim Libbin: Cost and return budgets: Suggests not asking farmers direct questions about prices of inputs or outputs. Cost and profit are hard to measure. Should limit questions to physical quantities.
- \$ Question: How can we assemble data on costs and returns for crops not currently being grown in Afghanistan, but which would be grown if more water storage were made available?
- \$ Saud: Main crops: winter wheat, spring wheat, beans, and potatoes. A question he suggests posing to farmers: >if you had more water, would you grow other crops. If so which crops?=
=>
- \$ Ximing Cai: Water resource system. Can use a model as a communication tool both for extension people and for ministers. Inputs and outputs should be clear to all.
- \$ Bob Foster: 60% of Afghan agriculture is in the Mazaur Sharif area
- \$ Steve Davies: Look at what big dams are currently being built. Need a baseline, namely current actual conditions.
- \$ Chris Goemans: Suggest finding out what institutions and rules determine the allocation of water.
- \$ Jeele: Afghan people have a poor system of water rights. Suggests the idea of auctioning the right to grow rice.
- \$ Steve Davies: Suggests using the model to explain where we need better data.
- \$ Phil Eberle: Notes there are many crops other than wheat being grown in Afghanistan. He thinks we can find crop data from many sources. Lots of secondary data are available.
- \$ Steve Davies: Pakistan has good enterprise budgets, especially in the Punjab area. He believes we need a way to ensure uniformity of cost and return budgets.
- \$ Phil agreed to coordinate the development of enterprise budgets. He says he needs a half time graduate student to help him. Q: Could Phil organize

the budget data development with Jerry Hawkes carrying out the details with his existing NMSU template.

- § Chris Goemans and Steve Davies: Water Data and Model Framework.
 - § Physical inputs
 - § Demands
 - § Institutions. e.g.: what are the rules that govern water allocation?
 - § What is the potential for water reallocation
 - § Objectives: income, profit, sales, food security, equity.

- § General request: we need a map of Afghanistan=s 18 basins.

Meeting Attendees			
No	Team Member	Email	Affiliation
1.	Saud Amer	samer@usgs.gov	United States Geological
2.	Chris Goemans	Chris.goemans@colostate.edu	Colorado State University
3.	Ximing Cai	xmcai@uiuc.edu	University of Illinois Urbana-
4.	Robert Foster	rfoster@nmsu.edu	New Mexico State University DCOP, AWATT, KABUL
5.	Stephen Davies	Stephen.davies@colostate.edu	Colorado State University Member, AWATT advisory
6.	Octavio Ramirez	oramirez@uga.edu	University of Georgia Athens. AWATT consultant
7.	Randy Hanson	rthanson@usgs.gov	United States Geological
8.	Robert	rgrassberger@comcast.net	New Mexico State University
9.	Jelle Beekma	kunduzriver@yahoo.co.nz	European Commission to Afghanistan
10.	Wolfgang Schmid	W_schmid@hwr.arizona.edu	United States Geological Survey
11.	Phil Eberle	eberlep@siu.edu	Southern Illinois University Carbondale, ag economist
12.	Frank Ward	fward@nmsu.edu	New Mexico State University Coordinator , AWATT water
13.	Greg Torell	gtorell@nmsu.edu	New Mexico State University. Graduate research assistant,

14.	Roger Beck	rogerb@nmsu.edu	New Mexico State University, AWATT C0-PI
15.	Terry Crawford	Crawford@nmsu.edu	New Mexico State University, AWATT, PI
16.	Anil Rupasingha	anil@nmsu.edu	New Mexico State University AWATT land and water policy
17.	Hamdy Oushy	hamdy@nmsu.edu	New Mexico State University AWATT forage and rangeland
18.	Paul O=Connell		NMSU (former World Bank)