

CENTRAL ASIAN WATERS

Social, economic, environmental and governance puzzle

Muhammad Mizanur Rahaman Olli Varis (eds.)



Central Asian Waters:
Social, economic, environmental and governance puzzle

Muhammad Mizanur Rahaman Olli Varis (eds.)

Helsinki University of Technology - TKK
Water Resources Laboratory
P.O. Box 5200
FIN-02015 TKK
www.water.tkk.fi/global

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FOREWORD

It was in 1986 that we took a train from Helsinki to Moscow. Our plan was to travel around Central Asia and get acquainted with water management in that part of the USSR. One of our particular interests was to get a view on what was going on with the Aral Sea – there were some rumors and even news about the environmental disaster but a clear picture was missing at the international arena.

In Moscow, we were privileged to have meetings with distinguished Soviet water specialists such as Professors V. Voropayev and M. Khublaryan who were modest in describing what was going on in with the Aral Sea but the solution was clearly outspoken; the region needed large-scale water transfers from the Northern rivers, most preferably from Ob-Irtysh through Volga. Otherwise, there would be a massive catastrophe with millions of migrants away from the area.

The solutions became very different than planned those days of Perestroika. In fact, it seems that the solutions have by and large not really been found yet; the catastrophe remains.

On our trip with a team that dominantly consisted of water engineering students – among them one of the two editors of this book, Olli Varis as a young postgraduate student – we had no way to the Aral Sea but saw and heard many things. The region was and is rich with ages-old wisdom and culture. It strived to modernize its economy with massive agricultural systems and other water-related means. Many things went well we heard but we also already knew that many went totally wrong too.

Looking back is easy of course but looking forward is far more difficult. Central Asia needs solutions and new insights to its development and for its water sector. We at the University tend to believe in an optimistic way that we must give all the means that we can for the young generation and they most probably will be able to make things better than what they are now. Such is the history of this book too.

In autumn 2007, we organized a course at Helsinki University of Technology on Global Water Issues, with a special topic on the Central Asian water problems. This course has, over the years, targeted various regions, from China to Middle East and North Africa. The course on Central Asia was quite productive and nice, and as one of the consequences, to our positive surprise, the Ministry of Foreign Affairs of Finland asked for our willingness to take over the Finnish component of their co-operation with Global Water Partnership and Interstate Commission for Water Coordination of Central Asia. We accepted this offer with great pleasure.

Along with the University's mandate, we thought to propose the distinguished partners to organize a seminar in the region with the scope to involve young water professionals from Finland and from the region to deliberate the water challenges of Central Asia. The partners were fond of this idea and consequently, the seminar will take place in Dushanbe, Tajikistan, in late November 2008 with a background document which is the book in hand.

I sincerely hope that this contribution is useful to the region's water colleagues and will bring the attention of the young water professionals to this highly attractive region and to the region's water challenges in a solution-seeking way.

Pertti Vakkilainen
Professor
Water Resources Management
Helsinki University of Technology

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PART I: Introduction



THE ARAL SEA KEEPS DRYING OUT BUT IS CENTRAL ASIA SHORT OF WATER?

Olli Varis and Muhammad Mizanur Rahaman

Water and Development Research Group, Helsinki University of Technology, Finland

The water-related challenges of the Central Asian republics including Kazakhstan, Kyrgyz Republic, Tajikistan, Turkmenistan and Uzbekistan, plus northern Afghanistan are indeed demanding. It is important to realize that, against the common perception, this region is not extremely water-scarce. The enormous environmental problems that have been created after 1960 are largely due to extremely uneconomic water use and due to policies that have not taken into consideration the sustainability of agricultural development, particularly in the basins of Syr Darya and Amu Darya Rivers. The per capita water use in the region is sky-high, being manifold in comparison to any other comparable part of the world. This waste of the valuable resource yields in very low economic gain, keeping the countries economically weak.

1 Introduction: water scarcity questioned

At the first glance it is easy to get an impression that the Central Asian countries are very short of water. All know the environmental disaster of the Aral Sea and the fact that the once-so-mighty Syr Darya and Amu Darya Rivers bring now only a fraction of the water to the Aral Sea in comparison to what the situation was only some decades ago.

But in fact the countries of the region are not so scarce on water. It has become almost paradigmatic

to consider the limit of 1000 m³ per capita of renewable freshwater per capita as a sort of rough indicator of water scarcity. Countries below that line are commonly considered of having shortage of water. Whereas such simple indicators have plenty of shortcomings, they are often useful in rough comparisons of different countries and regions.

For instance many of the countries in the Middle East and North Africa fall clearly below that line. Some of such countries include Algeria (457 m³/person/year), Tunisia (470), Israel (259), Jordan (135), Libya (110), Saudi Arabia (110), Yemen (220) and United Arab Emirates (62). Such examples can also be found from other parts of the world. Let us mention one; the economically booming North China which has very little water.

Corresponding author:

Olli Varis

Water and Development Research Group

Helsinki University of Technology- TKK

P.O. Box 5200

FIN-02015 TKK, Finland

Email: olli.varis@tkk.fi

Table 1. Water availability and use in the Central Asian countries (World Bank 2004).

	TOTAL RENEWABLE RESOURCES PER CAPITA M ³	% OF TOTAL RESOURCE	% FOR AGRICULTURE	% FOR INDUSTRY	% FOR DOMESTIC
Afganistan	2322	40.2	99	0	1
Kazakhstan	7368	30.7	81	17	2
Kyrgyz Republic	9293	21.7	94	3	3
Tajikistan	12706	14.9	92	4	3
Turkmenistan	12706	39.1	98	1	1
Uzbekistan	4527	50.8	94	2	4

The Hai and Luan River Basins, where for instance the economically booming Beijing and Tianjin are located, has only slightly over 200 m³ per capita of renewable freshwater to offer.

Now, the impression that the Central Asian countries have very little water is easily turned down by the figures in Table 1. In fact, some of the countries such as Tajikistan and Turkmenistan are relatively affluent with water, having more of this precious liquid than most European countries. None of the countries comes very close to the water scarcity limit of one thousand m³ per capita. Uzbekistan, for instance, has almost double the amount of water per capita in comparison to Spain, which is one of the major agricultural producers within Europe.

2 Focus on water demand and governance

So, why the Aral Sea has been drying out? Why Central Asia has become famous due to the environmental catastrophe of the shrinking Aral Sea? This large inland lake has lost a considerable part of its volume and has been split into two separate lakes. The smaller lake has sunk by 20 meters and the larger by 12 meters from the 1960 level (Glanz 1998, UNESCO 2000).

The reasons are generally attributed to the large-scale development of irrigated agriculture in the region in the Soviet era. Particularly cotton was seen as a strategic resource and in many years, the Syr Darya and Amu Darya rivers have not reached the Aral Sea. The region suffers from many other

serious environmental problems, many of which are related to the unsustainable agricultural development. Accumulation of salts and pesticides in soils is a particularly detrimental problem.

Rather than blaming the nature of not being generous enough in terms of water and other natural resources, we must approach the question from the other direction; from the water use which indeed is sky-high. The Central Asian countries are on the top of any global comparison of water use per capita (Figure 1). Their water use is many times higher than in countries such as Spain, Pakistan, Turkey, Mexico, North African countries and Middle Eastern countries.

This implies that the solutions to the environmental, social and economic disaster of the Aral Sea and, consecutively, for the whole region must be looked from the water demand direction.

We can continue along this line by looking how much wealth the economies of the Central Asian countries are able to generate from their production system. Figure 1 shows that the per capita Gross National Income (GNI) of those countries is very low in comparison to that of the other countries in the plot. Kazakhstan is an exception due to its notable oil earnings.

Although economic indicators such as GNP, GDP and PPP are powerful development indicators, they miss many crucial issues what comes to livelihoods, and possibilities for improving them. The most popular alternative concept is human development. It combines economic performance with social issues such as life expectancy and education.

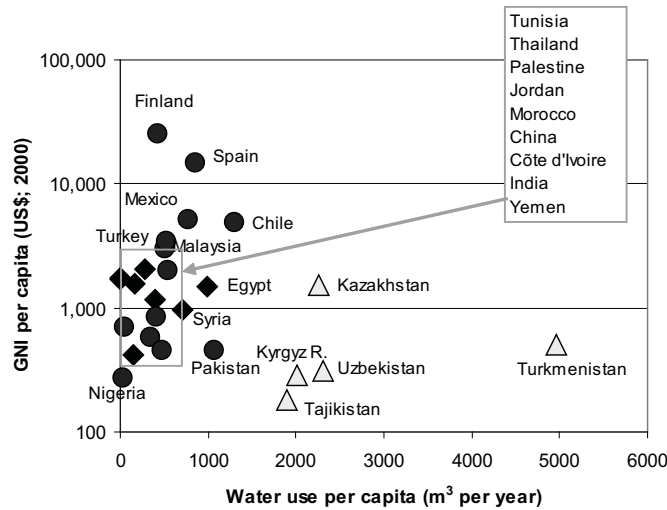


Figure 1. Water use does not grow with economic growth. GNP vs. water consumption in selected countries (World Bank 2004).

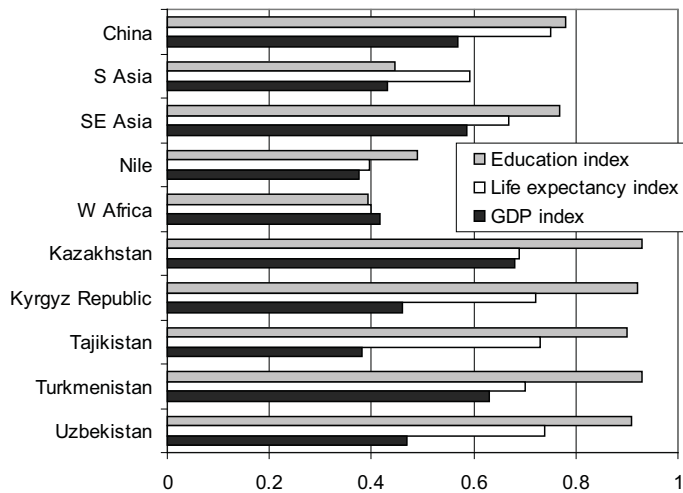


Figure 2. Components of the Human Development index (HDI) in selected regions and countries (source: World Bank 2004).

It is common to argue that people-centered development provides many solutions, which cannot be met with the contemporary resource-based approaches. Empowering the people to help themselves, raising public awareness and enhancing public participation are all important keys to overcome the limited financial capability vis-à-vis requirements.

The limits of the people-centered development are faced very rapidly if no systematic education of

the people is provided. Education has been shown many times to be the real booster to both economy and people-centered development.

According to official statistics, Central Asia has an exceptionally high education level (Figure 2). It is interesting to compare the region's countries to some other developing regions of the world. China and South Asia have witnessed a very rapid economic growth during the past decades. One obvious reason to their favorable development in

contrast to regions such as South Asia, West Africa or the Nile Basin countries is their high education level. Central Asia, however, has a still higher education level and therefore has a notable human potential for even rapid development once other conditions become favorable.

The Central Asian republics have witnessed very difficult times economically since the collapse of the USSR. The countries continue to have trouble in getting their economies on track, and notable poverty problems have followed (Figure 3). Despite of spending catastrophically high amounts of water for agricultural purposes, the level of malnourishment is high in Central Asia. It ranges from Tajikistan's and Uzbekistan's 31% to Kazakhstan's 10% as expressed in terms of malnourished children under the age of five years.

Central Asian republics show a very unfavorable grading in the global comparison on the level of corruption (Transparency International 2008). As for example, according to Transparency International Corruption Perception Index (CPI) rank, they all belong to the world's most corrupted 32 countries (Table 2).

The collapse of the USSR is already 17 years back in history. But it seems that the profound changes

Table 2: Transparency International's CPI index rank for Central Asian countries (TI 2008)¹

COUNTRY	CPI SCORE	COUNTRY RANK
Denmark	9.3	1
Sweden	9.3	1
Singapore	9.2	4
Finland	9	5
Australia	8.7	8
Kazakhstan	2.2	145
Tajikistan	2.0	151
Kyrgyz Republic	1.8	166
Turkmenistan	1.8	166
Uzbekistan	1.8	166
Afghanistan	1.5	176

of the economic and social systems have not really taken off in the region. The water-consuming production systems seem to predominate and the raw cotton is dumped to the world market without much added value that could in principle be generated by production of garments, fabrics, etc., from cotton, or attracting other, merely urban industries and services to the region. Important would be to urgently find alternatives and complimentary sources of income to cotton

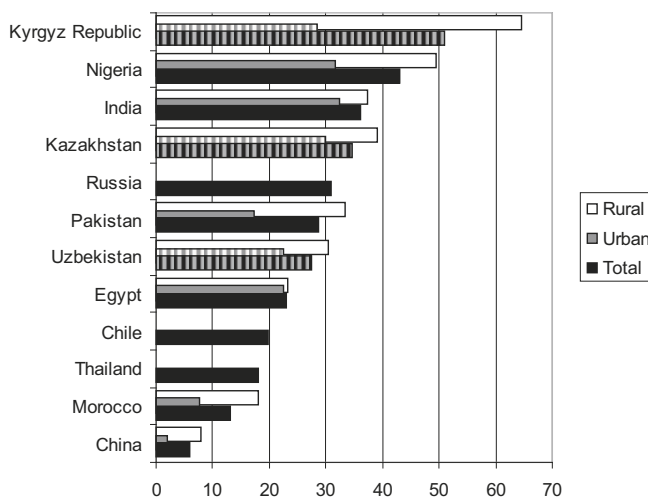


Figure 3. People in absolute poverty in selected countries (World Bank 2004).

farming. In fact, an indeed astonishing feature of the contemporary discourse on water problems of Central Asia exclude urban issues and industries almost entirely, although more than half of the region's population is living in urban areas. This relatively well educated urban population is now partly frustrating with limited possibilities to improve their living due to scarce economic opportunities.

3 Towards tapping the human resource

The biggest resource of the region is its human capital. The education level combined with culturally strong and tradition-rich population is a very valuable asset. The governance systems are challenged to tap this vast human resource to create wealth from the natural resources including water, instead of destroying ecosystems and causing massive problems to human health and well-being with wasteful resource use. Alternatives for economy, also urban ones, must be far more seriously considered than what seems to be done now.

The water sector should be more aware and conscious of the present state of and future expectations with regards to various development processes. The water sector could even on its own part make earnest attempts to foresee and reduce their gravity by rightly targeted policies. Seeing the water issues in the broad framework of other development issues such as the ones discussed here—and integrating the visions and policies of the sector—would be the way to go towards a better future through successful freshwater management. Management and development paradigms such as Integrated Water Resources Management may be very useful in drawing the attention to certain important aspects of water management. In the case of IWRM, this is the need to link social, environmental and economic aspects of water management with participation and good governance. The Central Asian Region definitely has plenty of challenges in all of these aspects and looking at those together, with the aim of balancing those aspects out is definitely important. However, for many of the challenges related to this puzzle, we must extend still our views and recognize that water is a subordinate to very many issues and

new paths should be detected and chosen at the entire macroeconomic level of the region and the politics—ignored in the IWRM concept—is a crucial part of the puzzle.

4 This book

This book includes 11 articles that scrutinize the economic, environmental, social and governance challenges of Central Asia; the region that is not limited to Aral Sea basin but encompasses Uzbekistan, Tajikistan, Kyrgyz Republic, Kazakhstan, Turkmenistan and northern Afghanistan. The book consists of two parts. The first one, consisting of three chapters, provides an introduction to the problemacy and institutions. Those chapters are being authored by the three partners of this book, Helsinki University of Technology, Global Water Partnership and The Interstate Commission for Water Coordination of Central Asia. Due to their role as setting up the context to the book, these chapters were not subjected to a peer-review process, unlike the ones that follow.

The second part of the book includes eight research articles. The first of them presents a regional institutional analysis of water management in Central Asia. Two subsequent chapters analyze the Central Asian Water challenges from the direction of Afghanistan. Then three articles centered on Uzbekistan follow. They are followed by two analyses of the Chu Talas Basin which is shared by Kyrgyz Republic and Kazakhstan.

The book has been produced within the GWP-CACENA Project, with the funding of the Ministry of Foreign Affairs of Finland. We are more than happy to be able to present our warmest appreciation to the Ministry, particularly to Jyrki Nissilä for extremely nice and fluent co-operation. We are equally thankful to Global Water Partnership and the Interstate Commission for Water Coordination of Central Asia and in particular to Björn Guterstam, Vadim Sokolov and Victor Dukhovny for most pleasant and productive collaboration. We would like to thank also all the authors and the numerous reviewers that have

brought their valuable effort together for producing this book. Particular thanks to Suvi Sojamo for keeping the project running, to Matti Kummumatti and Katri Tikkanen for mastering the publication and layout procedure, to Mira Käkönen for her valuable

insights, to Pertti Vakkilainen for his continuous support for our water resources investigations at Helsinki University of Technology, and to Kai Wegerich for his important contribution to the scientific content of the project.

Endnote:

1. The 2008 CPI scores 180 countries on a scale from zero (highly corrupt) to ten (highly clean).

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TOWARDS SUSTAINABLE WATER RESOURCES MANAGEMENT IN CENTRAL ASIA

Björn Guterstam

Global Water Partnership Secretariat, Sweden

Global Water Partnership assists countries in the sustainable management of their water resources in 14 regions of the world. The first step of this commitment is that the countries themselves establish National Integrated Water Resources Management Plans. In this process the GWP network provides neutral platforms for stakeholders to participate, when new policies are shaped.

1 Introduction

Global Water Partnership (GWP) is a network of partners involved in water resources management, e.g. government agencies, public institutions, private companies, professional organizations, multilateral development agencies and others.

The mission of the Global Water Partnership is to “support countries in the sustainable management of their water resources.”

Corresponding author:
Björn Guterstam
Network Officer for the regions of Central Asia & Caucasus,
Central & Eastern Europe and China
Global Water Partnership Secretariat
Drottninggatan 33
SE-111 51 Stockholm, Sweden
Email: bjorn.guterstam@gwpforum.org

“Although it is widely understood that water should be holistically managed, it was not until the Dublin Conference on Water and the Environment in 1992 and the United Nations Conference on Environment and Development held in Rio de Janeiro in 1992 that a more comprehensive approach to water management was judged necessary for sustainable development. This awareness, together with the need for participatory institutional mechanisms related to water, called for a new coordinating organisation. In response to this demand, the World Bank, the United Nations Development Program (UNDP) and the Swedish International Development Agency (Sida) created the Global Water Partnership (GWP) in 1996” (www.gwpforum.org).

Today, 12 years later, GWP is constituted of around 2,000 partners worldwide who are mainly organised

in partnerships at regional and country levels. The global secretariat is based in Stockholm and serves 14 Regional Water Partnerships, e.g. Central Asia-Caucasus, Central and Eastern Europe, China, South Asia (Figure 1). At the national level about 70 Country Water Partnerships (CWPs) provide platforms for stakeholders, including governments and NGOs, to address key water issues in an IWRM context. New CWPs are continuously established.

Recently, in June 2008, the five Country Water Partnerships (CWPs) of the GWP CACENA region, Armenia, Georgia, Kazakhstan, Kyrgyzstan and Tajikistan, were formally accredited by the GWP Global Secretariat, i.e. a certification that partnerships abide with the GWP governance documents Conditions for Accreditation, Policy on Partners and the GWP statutes. These documents serve to assure that the main values of GWP are followed by the partnerships established mainly at regional and country levels, i.e. inclusiveness, openness, transparency, accountability, tolerance, equity and solidarity.

The GWP role is to assist by bringing actors together and act as a facilitator. The partnership mechanism

deals with the human side of IWRM. *“While a lot of work is being done on good science, the real difficult part is the good process side. It is here that GWP has made significant contribution through its partnership approach in facilitating integrated water resources management.”* (Mohtadullah, 2007).

2 GWP in Central Asia and Caucasus

Water is the most limiting natural resource for development in Central Asia and Caucasus. In its mission to help the countries GWP's added value is to act as a facilitator and to provide a neutral platform for the stakeholders to work together for ways forward. As a consequence a long-term GWP commitment is necessary, if any added value is to be expected.

In February 2002 partners in Central Asia and Caucasus decided to establish a water partnership at regional level. This cooperation involved the key water stakeholders in the region including the governments of the eight countries Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan. The legacy from earlier days' of cooperation within the Soviet Union could now develop in a modern context of IWRM and sustainable development.

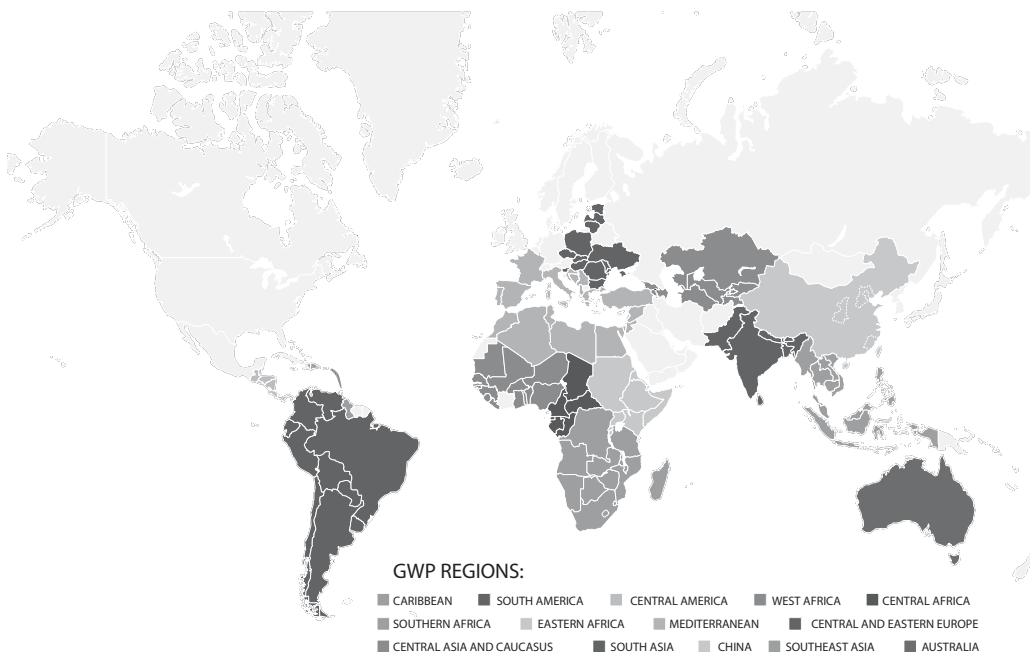


Figure 1. The Regions covered by Global Water Partnership

Today in Central Asia and Caucasus the management of water resources has both a regional and a national dimension. The founding partners of GWP CACENA in 2002 jointly presented the following list of Urgent themes of water security in the CACENA region:

- Transboundary watercourses
- Environmental protection
- Water quality and public monitoring
- Water supply and sanitation
- Public involvement in decision-making, including access to justice
- Access to information including modelling and GIS Technologies
- International Water Law
- Sustainable development of the energy industry
- Hydrographical aspects of IWRM
- Irrigation, including water saving aspects

Despite the urgency the Central Asia and Caucasus Water Partnership set out with a realistic long-term commitment towards water security.

The first six years, 2003-2008, the work GWP CACENA strategy focussed on advocating for an IWRM approach in order to convince political leaders, create public awareness and participation and to start helping with capacity building of water professionals.

Thanks to a solid foundation with the regional key stakeholders involved, achievements were seen early on. In fact the IWRM platform was one of very few meeting points where important matters between countries could be discussed.

Key achievements of GWP CACENA during its first six years:

- Stakeholders of different sectors came together to make a roadmap of water resources in the regional development beyond 2015
- Facilitated International Water for Life conferences 2003 and 2005 held in Dushanbe, Tajikistan
- Coordinated preparations of Central Asian documents for the 3th and 4th World Water

Forums (2003 and 2006), and for the Asia Pacific Water Forum 2007

- Initiated a the successful project proposal to the Government of Norway to develop a National IWRM and Water Efficiency Plan of Kazakhstan 2004-2007
- Assisted all eight countries to initiate national IWRM plans including status reports to UN Commission on Sustainable Development, 2003, 2005 and 2008
- Promoted political will and training of water professionals in the field of International Water Law in a cooperation with the University of Dundee, Scotland
- Initiated cooperation on water and environment between Central Asian and Finnish experts (in 2006 there was organized joint workshop with SYKE – Finnish Environment Institute in Helsinki)
- Since 2004 an agreement with the Ministry for Foreign Affairs of Finland secured a long-term additional funding to the regional work programme laid a solid foundation to establish Country Water Partnerships in all eight countries by actively recruiting key stakeholders as GWP CACENA partners

After an interim phase of four years, in late 2006, GWP CACENA partners established a Regional Water Partnership of GWP, i.e. an independent partnership within the GWP network with its own statutes, governing council and with responsibility to financially sustain its activities.

3 Continued IWRM Facilitation

Today GWP Central Asia and Caucasus has established itself as a key IWRM facilitator in the region and in most of the countries. Water resources are better secured in the political agendas of the respective governments and improvements of water governance as well as water resources management are visible, e.g. improved water legislation,

increased irrigation efficiency, environmental flow promotion, restoration of Small Aral Sea, and transboundary cooperation in Chu-Talas river basin. At the same time new threats appear such as climate change, but also increased demands on water resources for industrial development and remaining political disagreements between the Central Asian and Caucasian countries on how to share water resources.

A priority of CACENA governments is to exploit their energy and mineral resources for the global market, while at the same time people's livelihoods are mainly limited by poor governance of the water resources. This situation has left millions of rural people in poverty and ill-health mainly due to water logging, polluted waters, and lack of safe water supply and sanitation.

GWP CACENA works pro-actively to assist on those burning water issues. The time has come to use the IWRM concept when water resources policies and plans shall be implemented. This includes issues on financing of new water investments on irrigation,

water supply and sanitation with a need to find consensus among the stakeholders. Water policies and their financing shall be done in a sustainability context, i.e. to consider economic efficiency, environmental protection and social equity aspects.

In the 2008 work plan of GWP CACENA the certain activities build on the previous work supported by Finland and are as follows:

1. a) Policy dialogues in the form of inter-sector round tables to support/facilitate water policies/laws/IWRM plans
 - b) Public awareness campaign in the countries on IWRM planning and implementation/ drinking water and sanitation to meet principles of the International Year for Sanitation
2. a) Capacity development in the form of training seminars to support/facilitate improved IWRM understanding & delivery, including follow up activities Tbilisi on water financing



Figure 2. Kazakdarya in Karakalpakstan, a former coastal fishery village at the southern shore the Aral Sea that withdraw 150 km from the harbour.

- b) Knowledge dissemination on IWRM (publications, translations, etc)
3. a) Participation in the EUWI (EECCA) activities
- c) Helsinki University of Technology – TKK WDG activities for CA component to analyze IWRM goals
4. a) Support to CWP's - meetings to promote consolidation of governance structures
- b) Combine TKK WDG workshop with Regional Stakeholder meeting in Dushanbe
5. d) Regional administration (operations)
- transboundary, basin, local, community/grassroots, groundwater, coasts and land use.
3. *Water Governance, Institutions and Participation (GIP)*: Institutional responsibilities and reforms, legal systems at different levels and regulation, transparency, accountability and tackling corruption, gender issues, partnerships and stakeholder 'voice'.
4. *Financing of water resource public goods*: Financial sustainability, financing IWRM, flood management, pollution control and environmental protection, infrastructure for WRM, innovative mechanisms and instruments.
5. *Adapting to climate change and preparing for risk and disasters*: Disaster management, climate change and variability, coping strategies, risk management, scenario building and multi-disciplinary solutions.
6. *Addressing critical water challenges*: Strategies to address emerging problems including non-climate trends that impact on water: e.g. globalization, security and peace, conflict resolution, population and demographic change, energy-water nexus, industry and water, food-biofuels-water and trade.
7. *Promoting a clean and healthy world*: Reuse and recycling, waste as a resource, treating wastewater (towards zero discharge), beyond sanitation services, pollution abatement, re-introducing the public health paradigm for people and for the planet. It was stressed that the network needs to promote real support in these areas in terms of peer learning processes and direct advice within the network.

4 The new GWP Strategy 2009-2013

During 2008 GWP together with the Regional Water Partnerships is developing the following four strategic goals for the next five year strategy period, 2009-2013:

- Supporting countries to make the IWRM approach operational
- Promoting water resources management to address climate change and other critical challenges
- Establishing a global communication platform to share knowledge and develop capacity
- Reinforcing the network for effective delivery

Based on priorities of the regions seven thematic areas have been identified:

1. *The role of water in national and regional development*: IWRM planning and incorporating WRM into national development plans. Preparation of plans (for those countries lagging behind) and support to countries in implementing plans/policies that are in place Follow up to IWRM Roadmaps, harmonization across sectors, interface with non-water sectors.
2. *Spatial management of water resources*: The management and planning at different levels:

5 The significance of Finland's support

The support from the Government of Finland to the work of GWP CACENA on sustainable development from a water resources and environmental perspective is ongoing since late 2004. The support of Finland has helped to boost

the awareness and to build capacity among high-level policy makers and professionals with focus on environment and water resources (GWP CACENA 2006).

The Finnish support has helped the eight countries in the region to set up Country Water Partnerships of which the last two in Azerbaijan and Turkmenistan are planned to be launched in early 2008. This in turn has helped the Governments in their IWRM plan preparations.

5.1 How Finland can support in the coming years

In Central Asia and Southern Caucasus the general development is ruled by the global energy and mining business with little or no interest in the welfare of its people, its nature, or its ancient cultural water resources heritage. Sustainable development and MDGs are left to political systems with no legacy of democratic systems. In this situation the regional water resources provide an entry point for sustainable development. The challenge is to unlock political will and to promote regional water resources management agreements.

Today GWP CACENA is composed by partners from most sectors involved in water resources

management (144 accredited partners by GWP). The regional water partnership brings actors together on burning water issues such as water financing, water supply and sanitation, transboundary issues of the Aral Sea basin, etc. A momentum has been created towards sustainable management of the Central Asian and Caucasian water resources. In order to maintain and develop the neutral platform for water stakeholders in the Central Asian and Caucasus region international expert and financial support is crucial. A continuation of the long-standing relations between the Government of Finland and GWP would in the best scenario be of mutual benefit.

6 Conclusion

Global Water Partnership is a network of water stakeholders to assist countries in their IWRM plan preparations and implementation.

The added value of GWP is:

- Its convening capacity by bringing together local stakeholders
- In providing expertise for the local situation
- In helping achieve MDG targets with a focus on water and sanitation
- In assisting to bring solid proposals to decision-makers.

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IWRM IMPLEMENTATION: EXPERIENCES WITH WATER SECTOR REFORMS IN CENTRAL ASIA

Victor Dukhovny¹, Nazir Mirzaev¹ & Vadim Sokolov²

¹ Scientific-Information Center of the Interstate Commission for Water Coordination in Central Asia, Uzbekistan

² Global Water Partnership for Central Asia and Caucasus (GWP CACENA), Uzbekistan

1 Introduction

Water resources management is an art to supply the required water volume with acceptable quality at the proper place and in proper time. This is process which includes a few principal components: available water resources, engineering infrastructure, demands, allocation procedure, delivery service and finally – use of water. Each component addressed to certain task, implementation of which could be evaluated by proper indicators (see Table 1).

In the reality water resources management process is not so simple. Try to imagine: is it easy to coordinate available water resources with demands within one hydrographic basin? At first glance, – yes, it is the proper engineering task. On the one hand, it is necessary to estimate available water resources such as precipitation, surface runoff, groundwater storage, return water, and on the other hand, water demands of different economic sectors such as municipal water supply, irrigation, industry, hydropower generation, recreation, navigation, fishery, and of ecosystems. However, each component of the water balance is related to both the social situation and economic and political conditions (see Figure 1). Diverse water sources, their interrelations, different sector interests, different impacts and consequences, various management tools and mechanisms,

Corresponding author:
Dr. Vadim Sokolov
GWP Central Asia and Caucasus
c/o Scientific Information Center of the Interstate Commission
for Water Coordination (SIC ICWC)
11, Karasu-4, Tashkent 700187, UZBEKISTAN
E-mail: vadim@icwc-aral.uz

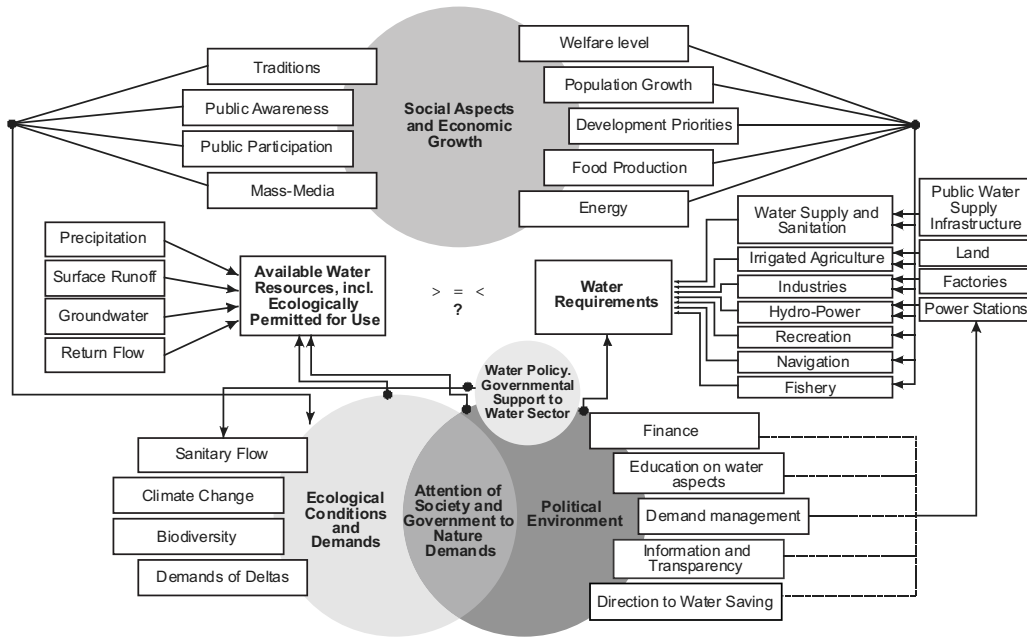


Figure 1. Interacting Factors within Water Resources Management Process

and complicated water infrastructure – all these components transform the proper engineering task into the very sophisticated co-ordination of huge number of links and providing the balance within this system. If we want to provide the balance of different interests, current and long-term goals, economic development and conservancy etc, then it is necessary to apply a holistic approach for solving this task.

Have a look to the Table 1, and you can see that monitoring, assessment, protection and development of available water resources (surface and ground water available for use) are key objectives of the first IWRM component. A key indicator to demonstrate the progress in achieving established objectives is a renewability of water resources in regard to their reserves or level in a source, water quality, and variability of these parameters over time. One of key objectives related to water infrastructure (reservoirs, irrigation and drainage canals, hydraulic structures, water supply network etc.) is proper operation and maintenance (O&M), including maintaining necessary operational regimes and design parameters of structures;

their repairing, up-grading, and, if necessary, reconstruction. At present, a quality of O&M is defined by such indicators as costs (financial and material), cost recovery, efficiency and operational life of infrastructure. Next component of water governance (water requirements) is aimed at assessing the needs of all stakeholders in water resources and managing these requirements based on available water resources. Major indicators of this component are a record-keeping of all points for water delivery, required amount and time of delivery (some water users may be interested in maintaining necessary water level or quality in their systems). After specifying available water resources and water requirements, the next component – water allocation – has to be implemented. In other words, this is the process of drawing up a balance taking into consideration available water resources and water demand. Here, major objectives are maximum possible involving all stakeholders in the process of negotiations (coordinating water allocation) and development of acceptable for all procedures (rules) for water allocation. A proposed indicator for this component is criteria of equity and rationality for establishing quotas or limits of water

Table 1. Components of the water resources management process and their indicators of implementation.

COMPONENTS	OBJECTIVES	INDICATORS
Available water resources	Monitoring Development Protection	Amount quality regime renewability variability
Infrastructure	O&M	Costs / efficiency/ cost recovery
Water requirement	Evaluation Demand management	Level/amount/quality/time/place
Water balance and allocation	Participation Plan (schedule) Regulations	Norm for flow rate Equitability & rationality criterion (share\quota\limit)
Water supply	Secured water supply	Sufficiency of water supply, uniformity, sustainability, minimum unproductive losses
Water use and productivity	Output and water saving	Productivity (more crop per a water drop)
Water use effects (MDGs)	Sustainable development	Sustainable use index
Management assets	Maintaining waterworks in operable conditions	Operability indicators
Water quality & ecological flows management	Meeting the environmental requirements	Quality indicators and ecological flow rates
Monitoring & Evaluation	Day-to-day management	Availability of on-line information from all key points of water delivery and distribution
Long-term planning	Adaptation to long-term changes	Water requirements over the planned period are met

use. A next component of the water governance process – water delivery from a source to water users (water supply) – is water delivery services. Proposed indicators for evaluating a quality of these services are a uniformity and sustainability of water supply under minimum non-productive water losses. Finally, a last key component is water use, including irrevocable water consumption. Here, a major objective is to produce output by using water or its maximum utilization. A proposed indicator is a specific water productivity i.e. an amount of water consumed per unit output. Producing output and using water, we should be guided by the

principles of sustainable development (providing opportunities for future generations to use water in the same extent as today); and a proposed indicator can be a sustainable use index, exceeding of which is inadmissible.

The IWRM is not already just an engineering task – we need to establish proper “water governance” system as a basis for proper water management process. The “governance” specifies rules of game and provides encouraging (regulative) mechanisms, when water managers are in charging for detailed elaboration and implementation clear

principles for water allocation, conservation, and monitoring while water users are responsible for rational water use in their practice. Interrelations related to water resources management and use between water management organizations and water users (other stakeholders of the process) are included into the IWRM system, and the political “superstructure” provides establishing the mechanism of “governance.”

The main goal of governance system is to provide equal democratic opportunities for all stakeholders involved into water resources management process. The main components of the governance system are the following:

- Political commitment
- Institutional arrangements
- Legislative framework
- Financing and Incentives
- Public participation
- Managerial tools and instruments
- Capacity development

2 Hierarchy of Water Governance

The governance system is not static in time – it should be permanently adapted to changes: natural, political, social, economic, technological. In the large extent, this can be referred to management rules that are the

most vulnerable part of the modern management system, and require paying the most attention of all specialists of the water sector because each basin, each sub-basin, and each water management or irrigation system, as each man, has its own features. This is predetermined not only by specific landscape, configuration and lithology of a watershed, but also by conditions of water withdrawal and distribution (surface water sources or groundwater; regulated or unregulated flow), parameters of water distribution system; the combination of hierarchical water management levels, composition of operational works and conditions at different levels of the water management hierarchy.

From the above mentioned view point, the governance system should cover the hierarchy levels of water resources management. The governance system covering the hierarchical levels should facilitate to achieve those indicators of water resources management process shown in Table 1. To put IWRM into practice it is necessary to develop specific mechanisms providing incentives for water users and water management organizations in increasing the water productivity, and at the same time to assist them in achieving this goal. These mechanisms should take into account specific factors causing unproductive water losses, instability in water supply, and unevenness of water

Table 2. Principal Indicators for Different Levels of Water Governance Hierarchy

INDICATORS	
TB	Minimum of Unproductive Losses
National	Contribution of Water Sector to GNP
Sub-Basin	Aggregated Basin Productivity
Irrigation System	Aggregated System Water Productivity
Water Users Association	Aggregated Water Productivity in WUA
End User / Farmer	Water Productivity in Field / Farm

distribution. As a whole, the ranking of causes of water productivity reduction that arise within the irrigation system promotes the development of practical measures for achieving the basic criterion of IWRM – provision of “potential productivity” of the water by all water users or, at least, approaching to it (see Table 2).

3 Improve Water Productivity

As shown in Table 3, the most approaches to improved water productivity are based on the engineering measures and IWRM tools in combination with organizational, legal, and financial measures. To implement these measures in the first place it is necessary to combine efforts of all stakeholders of water provision process starting from water management organizations, WUAs and ending by farmers themselves. Such joint efforts need agreed procedures and methods for stabilizing water provision, providing equitable water distribution, and establishing a proper public control by water users themselves. At the same time, the technical and financial assistance of the State and local governments is necessary. Finally, it is important to gain a general understanding of the importance for proper co-ordination of all water management hierarchy levels.

4 Sectors and Stakeholders Coordination

Important that governance system should provide horizontal integration among different stakeholders and sectors. A platform for effective participation in decision-making process of different stakeholders (government, NGOs, science, private sector, professional organizations) and sectors (agriculture, hydropower, nature, water supply and sanitation and etc.) should be created. The main criteria for evaluation success of this integrity are: inclusiveness (each stakeholder can show its interest); equity (opportunities – rights for equal access to water); transparency; effectiveness; accountability; coherency (to listen others); responsiveness; comprehensiveness; ethical considerations. Unfortunately, the listed criteria could not be assessed by numerical indicators.

The Government should those frames, within which water management agencies should operate for the interests of all economic sectors and stakeholders. The management system should provide conditions for achieving (or approaching to) the maximum water productivity and economic value by all water users (in irrigated farming, industry, and domestic water supply) and for successful livelihood. It means that the minimum water volume should be used to fulfill biological demands for production or technologically needed water consumption. At the same time minimizing water losses over all the technological cycle including water intake, water conveyance, water supply, and water use (so-called potential water productivity). Such an approach needs in the clear-cut co-ordination of all technological processes as well as the observance of other technological requirements (non-related with water resources).

For instance, in irrigated farming it means the need to follow all procedures of land reclamation, soil treatment, soil fertility conservation, selection of crop variety etc; correspondingly in the water supply sector - the rules and regulations of sanitation, combination of wastewater treatment and use etc; and in industry – introducing the advanced production technologies, regeneration (cyclical) water use, wastewater disposal and recycling etc. Thus, activity within IWRM often goes beyond “pure” water resources use and conservation, and includes all water-related spheres.

5 Water Policy and Legislation

It is obvious that the political environment using specific financial instruments (tariffs for water and the system of penalty sanctions and incentives) is encouraging all water users to reduce their water demand. At the same time, “governance” encourages to use social instruments – traditional methods of economically sound water use, and public participation in decision-making. All these and other factors should be taken into consideration for establishing strict rules of game. No doubt, that the effective water resources policy should be based on strong legislative framework, including:

Table 3. Causes for water productivity loss within irrigation systems and mitigation measures

HIERARCHICAL LEVEL	THE PROBLEM EXISTING	MITIGATION MEASURES	
	Instability of head intake and water disposal due to the following causes:	Type	Brief description
Basin	Political tensions	legal	Agreements
	Breach of the water supply schedule	organizational	Establishing a management body or developing the regulations
	Excessive water diversion at upstream intakes	legal	Agreements and fines
		technical	Distribution accuracy due to applying SCADA
	Underestimate of water losses at upstream river sections	technical	Monitoring and evaluation of flow rates and water losses
	Unstable flow modes in rivers	technical	Runoff control use of drainage water
Irrigation system	Lack of the system of water resources planning, distribution and dispatching	technical	Developing and putting operational rules into practice
			Drafting the plan and its adjustments
	Lack of water distribution discipline	technical	Regulations for water monitoring and records, Introduction of the GIS and water use plans
	Water over-diversion against schedule	organizational, economic	Applying of penalty provisions
	Lack of water keeping records	technical	Improving the water monitoring system
			Introduction of the SCADA
Lack of the proper water distribution procedures	technical	Establishing the management information system	
		Introduction of water rotation Use of all types of water resources	
Farm	Lack of the water use plan	technical	Water use planning and training
	Improper irrigation methods	technical	Recommendations on irrigation technique and methods
	Lack of adjustments in accordance with weather conditions	technical	Extension services

- Definition of roles and responsibilities of the Government, water governance institutions, stakeholders, users;
- Definition of social, economic and ecological value of water;
- Definition of strong position concerning institutional reforms, privatization, roles of local administrations and stakeholder participation;
- Definition of water rights, WUA roles, rules of game among sectors;
- Definition of interrelations between sectors – agriculture, energy, environment and others, and links with general socio-economic development.

It is important to note that in the process of IWRM implementation, there is not any need to seek universal and stereotyped approaches that are acceptable for different stakeholders (this principle is clearly stated in the GWP IWRM ToolBox, 2003) however, at the same time, more or less general rules regarding the institutional framework should be formulated. To put IWRM principles into practice indisputably should be based on the political will and appropriate social environment in the country. Its initiation cannot be an instantaneous action and has to develop gradually and quite systematically. Therefore, transition towards IWRM requires ensuring the thorough understanding and through developing an action plan.

6 IWRM Planning

A policy of water resources development should be built based on the strategic planning in order to predict and mitigate destabilizing factors such as the population growth, climate changes and their impacts on availability of water resources and water demand, changes in the set-up and development of water-consuming sectors, and especially dynamics of market relations (prices, global impacts etc.) in timely manner. It is necessary to keep in mind that owing to a complexity of water infrastructure and numerous actors in the water sector (water management organizations and water consumers)

practically covering the whole society it is impossible to obtain a fast result of water sector reforming. Therefore, the reforms require a certain time and funds that has to take into consideration also the use of transboundary water sources and forecasting the policy of riparian countries (the co-operation with other riparian countries should be built up on the basis of the interstate agreements, joint plans and actions in conformity with the international law and regulations).

Transforming the IWRM concept into a national action plan is based on the following fundamental activities:

- Developing the strategy for IWRM implementation;
- Establishing the training system for improving the understanding of IWRM principles at first among water professionals and then among communities' leaders (especially NGOs' leaders), and for disseminating knowledge at first among those people who involved in the pilot projects and then among proper stakeholders at all levels of water management hierarchy;
- Social mobilization of water users and other stakeholders; and
- Drafting the national IWRM plans and their approval by the governments.

7 IWRM Progress in Central Asia

A move of Central Asian countries towards IWRM principles (rather than towards new programs of technical rehabilitation since it was before) is based on the following regional "Road Map" (see Figure 2):

1. Mandatory preparation by each country the National IWRM and Water Efficiency Plans in co-ordination with Strategic Planning provisions. Under financial support of the Norway International Development Agency through the GWP and UNDP, Kazakhstan commences such activity, and by the end in

mid 2007 it will be a good example for other countries in the region. The principal goal of preparing the National IWRM Plan is to develop the efficient framework for putting IWRM into practice and to specify objectives, tasks, phases and scope of works, impacts, and mitigation measures combating destabilizing factors.

2. The sub-regional component for Central Asia has been developed by UNEP Collaborating Centre for Water and Environment (UCC-Water) and UNEP in close consultation with GWP CACENA (and coordinated with UNDP and UNECE). The programme intends to involve the IWRM National Councils established under the “IWRM Fergana Valley” Project supported by Swiss Development Cooperation. The development objective of the sub-regional work programme is: acceleration of the implementation of the IWRM 2005 target in three countries of Central Asia. The outputs foreseen are:

- Sub-regional report on progress on IWRM 2005 Target and IWRM Planning
 - Completed national road maps/work plans for implementation of the IWRM target (for three countries: Kyrgyz Republic, Tajikistan and Uzbekistan).
 - Needs assessment for support to implementation of IWRM reforms as identified in road maps and work plans.
 - Capacity built on IWRM planning for key water managers and decision makers
3. Providing the political will and commitments regarding IWRM and settling water-related problems. As a practical matter, the proposal of water professionals from Kazakhstan and Kyrgyz Republic regarding establishing the Coordination Water Committees at the level

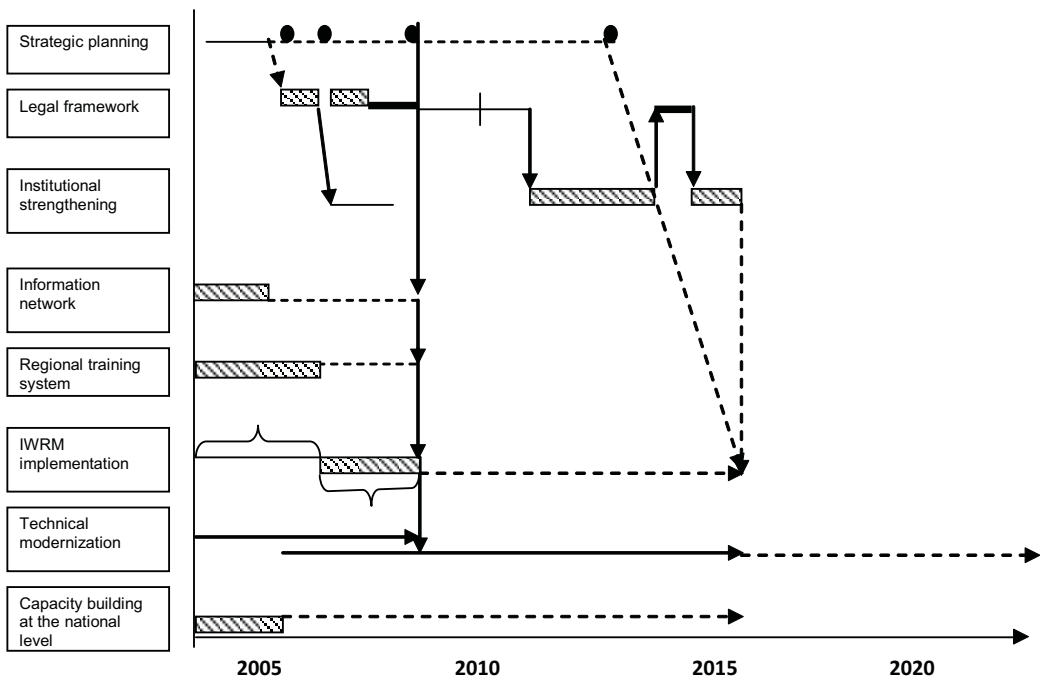


Figure 2. Regional Road Map to support IWRM implementation

of the Government/the Parliament under the direction of Vice-Premier with involving NGOs seems to be the sound decision.

4. Wide public participation in water management at all hierarchic levels. To this end, it is necessary to ensure the legal registration of the Public Water Bodies and WUAs, to develop the financial mechanisms for their involvement, and to provide training and wide popularization of IWRM principles and achievements with water users' participation.
5. Establishing the network of training centers and managing the coordinated training process over the region.
6. Legal and financial justification of IWRM and establishing its legislative basis, improving water charging mechanisms, legal and financial coordination of efficient water use aspects at all hierarchic levels; specifying the role of the Government in the case of WUAs, etc.; establishing water-saving funds; elaborating the environmental water requirements and ensuring nature priority under water allocation procedures.
7. Technical measures:
 - a. Introduction of water record keeping;
 - b. Participation of hydro-meteorological services in IWRM;
 - c. Establishing the extension service for improving the water productivity;
 - d. Computerization of managing the irrigation systems; and
 - e. Water-saving interventions.

At the same time, the mechanism of interstate consultations to coordinate water sharing, a regime of water use at transboundary rivers, and further economic development keeping in mind the regional interests was established. An analysis of the water management situation in the region has revealed the following destabilizing factors:

- Applying the water-sharing principles developed by former centralized water management agencies of the USSR that were included into the Basin Master Plans of Complex Water Resource Use and Conservation – they neglected the needs of ecosystems;
 - Disputes among the countries regarding water and energy resources and lack of mechanisms to tackle this issue;
 - Uncertainties related to global climate changes;
 - Lack of conflict resolution mechanisms and procedures to recover losses due to breaching the existing agreements on water sharing;
 - Insufficient information interchange among riparian countries, first of all, exchange of hydro-meteorological data to ensure the more accurate forecast of water availability and to improve transboundary water management;
 - Lack of policies and programs for regional economic integration, and insufficient co-operation to improve the irrigated farming productivity on the basis of a model that enables optimizing the rural labor in the region; and
 - Vagueness of information sharing and consultation about prospects of water use by Afghanistan etc.
- Also interstate consultations and exchange of experience regarding the following internal (national) water challenges are extremely useful:
- water scarcity and pollution at the national level;
 - supplying the population with safe drinking water;
 - low water and land productivity or low output of an irrigated hectare;
 - insufficient developing of the national legislative regulations;
 - Demographic growth and stability of rural population (the poorest part);

- high-accumulated depreciation of assets owned by water organizations;
- an insufficient material and technical basis of water organizations;
- inability of water users to pay for water delivery services;
- institutional issues (organizational and governing shortcomings);
- the poor cross-sectoral integration (between main water users);
- shortcomings of the personnel policy in the water sector;
- return flow management issues; and
- transboundary ground water use.

8 Indicators on IWRM Implementation at the Level of Irrigation System

In the frame of the IWRM-Fergana Project, the information management system (IMS) that includes the model of water allocation planning, software and database (DB) and allows calculating, in particular, indicators of water services quality (water delivery and distribution) [Dukhovny, Sokolov, 2005] was developed. In particular, the following indicators:

$$\text{Water supply factor (WSF)} = \frac{\text{Actual water supply}}{\text{Planned water supply}} \quad (1)$$

The situation is considered optimal (from the biological point of view) when a water supply factor equal to 1. In practice, a water supply factor not always reflects the extent of water sufficiency for crops. Depending on different purposes of the analysis, a water supply factor¹ is calculated for different levels of water management hierarchy top-down, including the end users.

A diurnal stability factor (DSF) can be estimated for each off-take as follows:

$$\text{DSF} = \frac{\text{a standard deviation of diurnal flow rates from an average daily flow rate}}{\text{an average daily flow rate}} \quad (2)$$

A maximum value of the diurnal stability factor equals to 1.

A ten-day stability factor (TDSF) is calculated in the same manner for each intake structure (water diversion into an irrigation canal)

$$\text{TDSF} = 1 - \frac{\text{A standard deviation of an average daily flow rates from an average ten-day period flow rate}}{\text{an average ten-day period flow rate}} \quad (3)$$

Water supply uniformity factor (WSUF) for one off-take or a group of off-takes (a farm, WUA, district, province etc.)

$$\text{WSUF} = 1 - \frac{\text{An absolute value of the difference between a WSF of an off-take (or a group of off-takes) and a WSF of an irrigation canal}}{\text{WSF of an irrigation canal}} \quad (4)$$

At present, a fundamental principle of water allocation coming from the principle of social equity is a proportionality principle. A criterion of assessing social equity of actual water allocation among water users is a water supply uniformity factor. A maximum value of water supply uniformity factor equals to 1. The higher a value of water supply uniformity factor the more equitable water allocation process.

$$\text{A coefficient of water supply uniformity from a canal} = \frac{\text{an arithmetical mean value of coefficients of water supply uniformity to water users in the canal's command area}}{\text{an arithmetical mean value of coefficients of water supply uniformity to water users in the canal's command area}} \quad (5)$$

A “from head to tail” uniformity factor - in the practice of water allocation, as a rule, there is

the so-called “from head to tail” problem, when upstream water users are supplied by irrigation water better than downstream water users. A “from head to tail” uniformity factor reflects the equity of water distribution along all length of an irrigation canal.

A “from head to tail” uniformity factor =
 $1 - (\text{An absolute value of the difference between a WSF of 25\% of downstream water users and 25\% of upstream water users}) / (\text{a WSF of 25\% of downstream water users})$ (6)

Technical efficiency factor (TEF)

$$\text{TEF} = \frac{\text{Water supply} + \text{transit flow} + \text{outflow}}{\text{Head water diversion} + \text{side inflow}} \quad (7)$$

In principle, a maximum value of the TEF cannot be more than 1. However, sometimes there are cases in the practice of water distribution, when the TEF is more than 1 due to the fact that it is very difficult to estimate dispersed water inflow into the irrigation canal.

Indicators of water allocation should be used for assessing a quality of water management. In the frame of the IWRM-Fergana Project, such an assessment is conducted on the regular base. A fragment of such assessment is given below. This assessment is made by means of comparing key indicators over the period of 2003 to 2007 (Table 4).

However, all these indicators reflect water management at the level of irrigation canal, and even the irrigation system rather than the IWRM

Table 4. Water distribution indicators for pilot canals (IWRM - Fergana Project)

PILOT CANAL	YEAR	ACTUAL	WSF	WSUF	DSF	TEF	SPECIFIC
		WATER SUPPLY					WATER SUPPLY
		mln. m ³	%	%	%	%	000' m ³ /ha
South Fergana Canal	2003	1053	112	60	85	81	12.6
	2004	925	93	89	87	88	11.0
	2005	871	85	94	85	87	10.3
	2006	816	77	94	84	89	9.2
	2007	643	68	92	84	86	7.2
Aravan-Akbura Canal	2003	83	74	45	70	54	13.1
	2004	66	88	63	91	53	9.8
	2005	57	77	69	84	54	8.5
	2006	54	75	74	81	59	8.0
	2007	64	83	82	90	59	8.3
Khodjabakirgan Canal	2003	116	82	36	41	80	14.4
	2004	113	85	82	58	78	15.8
	2005	115	86	73	64	78	16.5
	2006	90	69	80	54	80	12.1
	2007	88	67	77	62	81	11.8

as a general system. It is although necessary to carry out a comprehensive assessment of IWRM (its effectiveness, economic effects and impacts on achieving MDGs).

9 The Way Forward

The practical progress in reforming water management in Central Asia countries can be obtained by applying IWRM principles described in this paper and by resting on appropriate institutional, engineering, and other measures under sufficient funding that needs to be allocated. The main measures include the following:

- Providing sustainable water provision, equitable and regular water sharing between sub-basins and irrigation systems along with significant reduction in unproductive water losses on the way to water users;
- Introduction of the democratic principles into the water management practice by using a participatory approach and involving all stakeholders in the process of step-by-step transferring the governing functions to lower levels of the water management hierarchy as well as allowing active participation on an equal footing with the Government in supporting and developing of water supply systems;
- Solving of some social problems related to equitable water supply of the population, especially ensuring safe drinking water;
- Settling environmental problems related to water sector's activities; and
- As a final goal, increase in the efficiency of water and land use.

Endnote

1. All factors are unitless, and to express them in percents (%) it is necessary to multiply their values by 100.

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PART II: Research Papers



WATER MANAGEMENT IN CENTRAL ASIA AND THE ACTIVITIES OF UNECE

Bo Libert

United Nations Economic Commission for Europe, Switzerland

The water situation in Central Asia is difficult in particular after the cold winter in 2007/2008. UNECE work on water in Central Asia builds on: the United Nations Special Programme for the Economies of Central Asia (SPECA) and the application of the UNECE regional environmental conventions. The UNECE promotes the existing international legal framework and develops capacity for its application in the region. Its activities include support to the Chu-Talas Commission, the development of the Central Asian Regional Water Information Base, the effective implementation of the EIA Convention, work on dam safety, regional cooperation on water quality and integrated water resources management.

1 The critical water situation in Central Asia

The water situation in Central Asia is dire – the Aral Sea is still shrinking, upstream and downstream countries are not agreeing on water release regimes and water distribution, energy and irrigation sectors are competing, water ecosystems are deteriorating further and climate change may irreversibly decrease water availability. It is likely that Afghanistan will use more water from the Amu Darya River in the near future.

Contrasting the overall situation, the stabilization of the Northern Aral Sea is a positive development, leading locally to a more stable ecosystem and possibilities for the population to develop fisheries as a source of income. This is the result of Kazakh efforts to build a dam to seal off this part of the Aral Sea, so the inflow from Syr Darya can be accumulated.

After a very cold winter in Central Asia in 2007/2008, the water situation is even more acute and political relations are strained. The extensive use of hydropower for heating from winter releases in Kyrgyzstan has resulted in a very low level of water in the major Toktogul Reservoir on the Naryn, a principal tributary of the Syr Darya. As a consequence, the downstream countries

Corresponding author:
Bo Libert
Regional Adviser on Environment,
United Nations Economic Commission for Europe
Palais des Nations
CH-1211 Geneva 10, Switzerland
Email: bo.libert@unece.org

Uzbekistan and Kazakhstan cannot get as much water for irrigation in the spring and summer from the Syr Darya in 2008 as in average years.

The past winter also had severe consequences for energy-poor Tajikistan, with significant losses of human lives and livestock. Basic services such as electricity and water supply were not available for weeks, even in the capital Dushanbe. The last winter, the coldest in several decades, demonstrated the urgent need for Tajikistan to develop reliable energy supplies.

Since it became a sovereign country, Tajikistan has placed development of hydropower in the Amu Darya basin high on its national agenda. This objective has become even more important after the experiences of the cold winter. The Sangtuda I and II hydropower stations on the Vakhsh River, a major tributary of the Amu Darya, are being constructed with the support of Russian and Iranian capital, but the major Rogun hydropower station, also on the Vakhsh, is still without proper financing. Political support from the downstream countries Turkmenistan and Uzbekistan would make it easier to attract capital.

Several regional organizations are involved in efforts to resolve these conflicts. The Interstate Commission for Water Coordination (ICWC) and the International Fund for the Saving of the Aral Sea (IFAS) were established directly after the dissolution of the former Soviet Union, but lately the Eurasian Economic Community (EurAsEC, includes Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan but not Turkmenistan) has also supplied a forum for negotiations. In particular ICWC is an important forum for the resolution of operational water management problems since the beginning of the 1990s. However, the serious situation in 2008 prompted a series of bilateral and multilateral meetings bypassing the regular regional structures.

United Nations agencies and other international organizations are left outside the negotiations, but make efforts to join forces to assess the situation in advance of the coming winter. The EU role has not been very incisive in the region, however, with the

adoption of its strategy for Central Asia it may play an more important role in the future. Tentative investors from the Russian Federation are also active in discussions on financing for the Rogun reservoir and hydropower station.

It is a general problem in the development of integrated water resources management in Central Asia that authorities for water management and environmental protection are separate. Water management but not environmental authorities are involved in regional water cooperation reflecting that water use in the short term for irrigation is more important than the protection and sustainable use of water.

2 SPECA and the UNECE conventions

UNECE work to improve water management and cooperation in Central Asia build on two pillars/mandates: the United Nations Special Programme for the Economies of Central Asia (SPECA)¹ with the SPECA water and energy programme of work, and the application of the UNECE regional environmental conventions.

SPECA was launched in 1998 on the request from the region to strengthen cooperation in Central Asia and its integration into the world economy. UNECE and the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) provide support for the SPECA programme.

In 2004, experts from Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan produced a regional water and energy strategy (UNECE, UNESCAP, 2004) within the framework of the SPECA working group on energy and water resources. The strategy was one of the first documents to clearly make links between water and energy issues. The strategy, endorsed at different levels by four of the five Central Asian countries, outlines needs for action in the water and energy sectors in the shorter and longer terms for the benefit of the whole region. For instance, the strategy stresses the importance to develop a legal framework



Figure 1: Map of Central Asia. Source: United Nations, Department of Public Information (1998)

for water and energy cooperation, to strengthen national and regional institutions, to improve monitoring of and information on water resources, and to protect water and energy resources. Due to unresolved political issues and the lack of finances, only restricted components of this strategy are so far being implemented by the SPECA programme of work on water and energy. Examples are the Chu-Talas and dam safety activities described below.

The UNECE environmental Conventions establish rules for cooperation between neighbouring countries both on the environment and on shared natural resources. Three of these conventions are highly relevant for water cooperation in Central Asia:

- The Convention on the Protection and Use of Transboundary Waters and International Lakes (Water Convention) and its Protocol on Water and Health

- The Convention on Environmental Impact Assessment in a Transboundary Context (EIA or Espoo Convention) and its Protocol on Strategic Environmental Assessment (SEA Protocol)
- The Convention on the Transboundary Effects of Industrial Accidents (Industrial Accidents Convention).

The UNECE Water Convention is of particular importance, as it provides a basic international legal framework for transboundary water cooperation. Uzbekistan recently ratified this Convention, but was only the second Central Asian country to do so, after Kazakhstan. However the relevance and authority of the Convention is recognized by all Central Asian countries and also those which have not ratified the Convention are actively participating in the activities in its programme of work.

The Water Convention prescribes national measures for the protection and environmentally sound management of shared, transboundary water resources. It obliges Parties to prevent, control and reduce water pollution from point and non-point sources. Riparian countries are required to conclude agreements and to create joint bodies for the management of transboundary waters. The Convention further includes provisions for monitoring, research and development, consultations, warning and alarm systems, mutual assistance and the exchange and protection of information, as well as for public access to information. A key provision of the Convention is that “transboundary waters are used in reasonable and equitable way”.

The Water Convention does not deal explicitly with water quantity issues and the allocation of water, a key issue of dispute in Central Asia, but it does set up a framework for the resolution of these and other problems.

The Water Convention’s Protocol on Water and Health aims to protect human health and well-being through improving water management and through preventing, controlling and reducing water-related diseases. To meet these goals, Parties are required to establish national and local targets, tailored to their national conditions and capacities, in the areas of health, water management and infrastructure development and management.

The Protocol is therefore very relevant for all Central Asian countries which pay a very high social cost because of lack of access to safe water and sanitation and water-related diseases - among the most common causes of child mortality. No Central Asian country has ratified it to date but Kazakhstan, Kyrgyzstan and Tajikistan are taking steps towards it.

The assessment of the environmental impact of objects and activities at an early stage of planning, including their cross-border impact, is a well-recognized procedure in modern environmental policy and an important condition for good neighbourly relations between countries. The UNECE EIA Convention obliges States to notify

and consult each other on all major projects under consideration that are likely to have a significant adverse environmental impact across borders. The public and non-governmental organizations (NGOs) play a key role in the implementation of the EIA Convention.

Application of the EIA Convention is highly important if water and environmental cooperation are to be improved in Central Asia. It is essential that new projects such as production facilities or water infrastructure with a possible impact on ecosystems be communicated to and discussed with neighbouring countries. For example, a new dam or canal will most likely have significant effects on water flow downstream, and consequently on the ecosystem.

The SEA Protocol has a great potential to enhance water management as it ensures that environmental assessments are integrated into the development of official plans and programmes at the earliest stages.

Kyrgyzstan and Kazakhstan are Parties to the EIA Convention, and Tajikistan and Uzbekistan are preparing to ratify. None of the states are Party to the SEA Protocol.

The UNECE Industrial Accidents Convention was negotiated to protect human beings and the environment from industrial accidents by preventing these as far as possible, by reducing their frequency and severity and by mitigating their effects. The key words are: preparedness, prevention and response. The Convention encourages its Parties to help each other in the event of an accident, to cooperate on research and development, and to share information and technology.

In Central Asia, Kazakhstan is the only Party to the Convention but Uzbekistan and Kyrgyzstan are preparing to become Parties.

The Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention) is a fourth UNECE Convention of relevance. It has been ratified by all countries

in the region with the exception of Uzbekistan. Access to information and public participation are important conditions for integrated water resources management, and there are a number of activities, run by different organizations, which support the Aarhus Convention's implementation in Central Asia.

3 UNECE water management activities in Central Asia

The efforts of international organizations to address regional water relations in Central Asia declined around 2000. One reason is that projects aiming to resolve the major issues, such as the water release regime on the Syr Darya, have not been very successful. And even though there are attempts to involve, for example, the UN to play a role in the regional organizations, it is difficult for the Central Asian States to agree on a procedure involving outside mediators.

In recent years, however, UNECE has intensified its engagement with Central Asian water issues. Its approach has been to identify windows of opportunity for the implementation of the UNECE Conventions as well as components of the SPECA regional strategy, to fund-raise and to initiate projects. All projects are implemented on the direct request of participating countries.

These activities, all with extrabudgetary funding, are being developed in close cooperation with the authorities in the region and with regional and international organizations: The Organization for Security and Cooperation in Europe (OSCE), the United Nations Development Programme (UNDP) and the United Nations Environment Programme (UNEP), though the Environment and Security Initiative, as well as UNESCAP. In collaboration with the European Union Water Initiative and the European Commission, UNECE is engaged in developing integrated water resources management in the Central Asian States. In cooperation with Germany and other EU countries, UNECE might also play a role in the implementation of the EU Strategy for Central Asia in the water and energy sectors. Among organizations in the region, UNECE works closely with IFAS, ICWC and EurAsEC.

3.1 Development of new water relations – the Chu and Talas Rivers

Water relations in Central Asia took a significant step forward on 26 July 2006 when the Commission of the Republic of Kazakhstan and the Kyrgyz Republic on the Use of Water Management Facilities of Intergovernmental Status on the Rivers Chu and Talas was inaugurated. The Chu-Talas Commission offers a mutually beneficial way for Kyrgyzstan and Kazakhstan to share responsibility for the water infrastructure used by both countries. Following a bilateral agreement from 2000, Kazakhstan has agreed to contribute to the operating and maintenance expenses of a number of Kyrgyz dams and reservoirs that supply water to both countries. This addresses a contentious issue and constitutes a breakthrough in Central Asian water relations, as the sharing of water resources between upstream and downstream countries has often been characterized by tension and insecurity.

The establishment of the Chu-Talas Commission was supported by an OSCE/UNECE/UNESCAP project ("Chu-Talas I") financed by Sweden and the United Kingdom. The project facilitated the development and approval of the Statute of the Commission as well as guidelines for financing costs of repair, operations and other activities related to water infrastructure. The project demonstrated a coordinated action of international organizations, as the Chu-Talas I project was complemented by activities funded by the Asian Development Bank (ADB). The best practices on transboundary water management between Kazakhstan and Kyrgyzstan are being promoted on the river basin website (www.talaschu.org).

The importance of the bilateral Chu-Talas Commission is demonstrated by the fact it has met five times within less than two years after its inauguration.

A follow-up project started in 2007 ("Chu-Talas II") supports a further broadening of the cooperative efforts to improve the water resources management of the Chu and the Talas. The Commission is

challenged with certain tasks in its practical work that will be addressed by the new project, for instance:

- Updating the methodology of the co-funding of maintenance, operation and reconstruction costs for each water facility
- Developing a unified methodology for volumetric water measurement
- Defining the impact of groundwater flow in the Chu and the Talas and its effect on water allocation

Kyrgyzstan and Kazakhstan have further agreed that opportunities exist for a step-by-step broadening of the functions and mandate of the Commission as well as to revise the bilateral agreement. Cooperation on eco-system protection and water quality issues are examples of possible new functions. Public participation in the decision-making process should also be further developed. In addition to the work by OSCE and UNECE in Chu-Talas II, funded by Finland, ADB will continue its coordinated support for activities of the Commission Secretariat.

3.2 Better information for better water management decisions

The Central Asian Regional Water Information Base Project (CAREWIB), funded by Switzerland, is improving the availability and exchange of information in water and environmental sectors in Central Asia. The project is implemented by the Scientific Information Centre of the Interstate Commission for Water Coordination (SIC-ICWC) in Tashkent in cooperation with UNEP and UNECE. A regional Internet portal (www.cawater-info.net) provides access to up-to-date information on water and related issues in the region. The portal is based on existing information maintained by SIC-ICWC as well as other organizations. Publications in paper format are regularly produced and distributed to increase outreach to policymakers, NGOs and the general public.

An information system for water management in the Aral Sea basin is another component of the project. This system is a practical tool for integrated water assessment that takes into consideration available water resources and their allocation among river reaches, provinces and water-management systems. It includes GIS maps for each of the Central Asian countries. The information system is currently a tool for management and cooperation within the framework of ICWC. However, part of the information will be provided openly through the Internet portal.

What started as an effort to improve information exchange and also coordination between donors is now a much more ambitious project, one aiming to make the information flow on water issues more efficient and transparent in Central Asia. A second phase of the project began in autumn 2007. An important task in the new project phase is to develop national information systems on water issues.

3.3 Environmental impact assessment in a transboundary context

Kazakhstan and Kyrgyzstan, both Parties to the EIA Convention, share the Syr Darya, the Chu and the Talas rivers. Planned activities upstream in Kyrgyzstan with a possible significant impact on the Kazakh environment should be communicated at an early stage to Kazakhstan if the EIA Convention is to be adhered to. Kazakhstan should, according to the Convention, have the opportunity to present its point of view on such planned activities. Projects in Kazakhstan with a possible impact in Kyrgyzstan should similarly be communicated to Kyrgyzstan.

A project funded by Norway and implemented by OSCE and UNECE in cooperation with environmental authorities in Kyrgyzstan and Kazakhstan demonstrates the effective implementation of the EIA Convention. A pilot EIA has been performed according to the provisions of the Convention. The site that has been assessed is a planned gold and copper mine ("Andash") situated close to a tributary of the Talas and to the border with Kazakhstan. Pollution from mining operations is generally a serious problem in

Central Asia, and the issue here is to minimize the risks for future pollution.

A pilot EIA (www.unece.org/env/eia/central_asia.htm) has been successfully completed with the involvement of the public on both sides. In autumn 2008 the EIA procedure will be assessed by international experts. On the basis of the assessment and the work of national experts in Kazakhstan as well as Kyrgyzstan, national procedures and legal texts contributing to an improved implementation of the EIA Convention will be developed. Overall, the project has been very successful and has facilitated the development of a substantial dialogue between the two countries.

3.4 Cooperation to improve water quality

Downstream on the Syr Darya and Amu Darya, two of the major rivers in Central Asia, the poor water quality is having serious negative health effects. Management of water quality is highly inefficient and insufficient both at the national as well as regional levels: national policies and regional cooperation urgently need to be improved, with the ultimate aim of achieving good water quality. In spite of the gravity of the problems, there is currently no systematic cooperation on water quality between the Central Asian countries.

The UN is making funding available to UNECE to improve cooperation and policies on water quality, and a new project will start in autumn 2008. A first step is to establish common principles for the measurement of water quality, joint assessments and the exchange of information between the countries. The development of more efficient national policies, including standards and principles for permitting of environmentally harmful activities, is another key aspect. As the monitoring of water quality has seriously deteriorated since the beginning of 1990s, establishing an efficient monitoring network presents a substantial challenge.

3.5 Dam safety to protect the population

Central Asia has more than 100 major dams and other water control facilities, mostly on rivers shared by different countries. The dams are aging and in some cases not adequately maintained. Meanwhile, the number of people living downstream from these dams is growing. For example, the Fergana Valley, shared by Kyrgyzstan, Tajikistan and Uzbekistan, has 9 million inhabitants. If a dam upstream from this valley were to break, the consequences could be disastrous.

The first phase of a UNECE-UNESCAP project on dam safety was implemented in 2006 which resulted in a publication analysing the present situation (UNECE, 2007a). With the exception of Uzbekistan there is no legislation in the Central Asian states to ensure dam safety monitoring and control.

The first phase of the project resulted also in (a) a model national law on safety of large hydraulic facilities, including dams, intended to be a basis for national harmonized legal frameworks for dam safety, and (b) a draft regional agreement on cooperation on dam safety, which stipulates, inter alia, exchange of information and notification of other countries in case of accidents with dams (UNECE, 2007a).

The Central Asian countries are actively seeking to improve or revise the existing legal provisions and institutional modalities for dam safety. Tajikistan and Turkmenistan have decided to develop laws on safety of hydraulic structures, including dams, by adapting the model law; in Kyrgyzstan, the creation of a national commission on safety of dams is under way; and in Kazakhstan, changes in the Water Code have been proposed to incorporate provisions for regulating dam safety. In Uzbekistan, work is under way to enforce the Law on safety of hydraulic structures, adopted in 1999. All the countries are willing to pursue regional cooperation on dam safety by setting up a legal and institutional framework along the lines of the proposed regional agreement.

A funding agreement was recently signed with Finland to continue the project in 2008–2010. The

objective in the new project phase is to support the countries to improve legal and institutional frameworks on the national level as well as to develop regional cooperation mechanisms.

3.6 Preparedness, prevention and response to industrial accidents

The Industrial Accidents Convention has assessed the situation with regard to preparedness, prevention and response to industrial accidents in Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan through its Assistance Programme for the Countries of Eastern Europe, Caucasus and Central Asia (EECCA) and South-Eastern Europe (SEE). The conclusion was that the countries need assistance to develop policies on industrial safety: adequate legislation as well as proper institutions are needed.

A so far unfunded project in the above-mentioned Assistance Programme in its first phase aims to analyse in more detail deficiencies in the legal and institutional frameworks of the four countries mentioned above. In the second phase of the project, steps will be taken to eliminate these deficiencies. Development of cross-border cooperation aimed at exchanging information on hazardous activities, assessing risks and drawing up compatible emergency plans in border areas is a particularly important direction of work.

3.7 Integrated water resources management at the national level

The National Policy Dialogues are the main mechanism for implementing the work programme of the EU Water Initiative EECCA Component. National Policy Dialogues bring major stakeholders, including government authorities and NGOs, together to improve the management of water resources. The National Policy Dialogues take a long-term and holistic perspective and aim at step-by-step development by contributing to new legislation and improved institutional arrangements, water management instruments, financing strategies, etc. UNECE is the strategic partner of the EU for the EECCA countries on the policy dialogue process related to integrated water

resources management, whereas the Organisation for Economic Co-operation and Development (OECD) is the strategic partner on water supply and sanitation. In 2008, UNECE is initiating National Policy Dialogues in Central Asia, with Kyrgyzstan as the first country. The selected directions of work in the first phase in Kyrgyzstan will be the establishment of a River Basin Council for the Chu basin and the development of a plan of measures on sustainable water management, safe drinking water supply and adequate sanitation based on the provisions of the Protocol on Water and Health.

As there are many organisations involved in IWRM work in the region, measures are taken to achieve synergies and coordination. During autumn 2008 a joint platform for coordination is being set up by UNECE, UNDP, OECD, the EU Commission and other organisations.

3.8 Other activities in the programmes of work of UNECE Conventions

The effectiveness of UNECE Conventions stems not only from the fact that they are a solid legal framework, based on modern, internationally recognized principles and good practices, but also from their programmes of work supporting countries in implementation and in tackling emerging challenges.

In addition to the above-mentioned projects, activities under the programme of work of the UNECE Conventions include (i) development of technical and strategic guidelines to support implementation of the different provisions, (ii) capacity building and (iii) specific activities supporting implementation, compliance and assessment. Central Asian countries, Parties as well as non-Parties, regularly participate and benefit from such activities and products.

Guidelines on monitoring and assessment of transboundary waters (eg. UNECE, 2006) or on sustainable flood management developed under the Water Convention are two examples that are useful tool for Central Asian countries.

Currently the Water Convention is addressing climate change and adaptation of the water and water-related sectors, especially in the transboundary context. Central Asian countries are among the most vulnerable to the adverse effects of climate change in the UNECE region and limited financial resources reduce their adaptive capacity. The Guidance on water and climate under development will become an important instrument for Central Asia as a whole since many of the challenges posed by climate change require regional cooperation and effective regional action.

Another important product of the Water Convention was the first Assessment of Transboundary Rivers, Lakes and Groundwaters in the UNECE region (UNECE, 2007b). It is the first ever in-depth report produced on transboundary waters in the region and has contributions from four of the five Central Asian countries. The second assessment, to be prepared for the next Ministerial Conference Environment for Europe, will have a regional focus on Central Asia.

Similar activities are also developed in the work programmes of the other Conventions. The EIA Convention has developed material guiding the practical implementation of the Convention and also contributed to the development of specific implementation guidelines for Central Asia. In addition to the above mentioned Assistance Programme of the Industrial Accidents Convention, this Convention has contributed to the development of important Safety Guidelines and Good Practices applicable in Central Asia: on pipelines as well as on the management of tailing dams.

4 Challenges

Over the past few years, achievements in the resolution of the main water issues in Central Asia have not been very significant. The basic issues of conflict remain and have even been exacerbated during difficult years such as 2008.

The UNECE approach is to promote the existing international legal framework and to help develop an understanding and capacity for its application in

the region. The UNECE Conventions represents an authoritative interpretation of fairness and reciprocity in the relations between countries thus being a counterweight to the political and economic agendas that are the starting point for the difficult negotiations in the region. Although the UNECE conventions cannot resolve all of the difficult and sometimes unique problems that are found in Central Asia, they can contribute to the development of mutual understanding and establishment of shared principles.

UNECE activities are all implemented in close cooperation between partners in the region and international partners. A key objective is to develop the capacity in Central Asia – planting the seeds for the future. Cooperation and coordination are vital to ensure that decision makers have time to take part in important activities; experts in the region are frequently overloaded with activities organized by international and donor organizations.

The challenge for UNECE and its Conventions is to take a long-term perspective in their work in the region, assess their impact and to develop further the understanding of how to apply the various conventions in the Central Asian environment. In this context it is worth mentioning that the Water Convention has started developing a guide for ratification of the Convention that potentially would help Central Asian countries to develop their water cooperation.

The UNECE strategy for the future is to continue, while building on its achievements, the implementation and further development of projects and activities supported by Central Asian countries that contribute to moving the political agenda forward and to the resolution of the problems in the region.

A final key aspect requiring more attention in Central Asia, as well as from international organizations and bilateral donors, is that of energy efficiency. Access to energy is at the root of the problems facing Kyrgyzstan and Tajikistan, and seriously impacts water relations in the region. It is always more cost-efficient and quicker to save energy

than to build new power-generating facilities, and efforts to develop energy efficiency in Kyrgyzstan and Tajikistan are thus of great importance for all of Central Asia. UNECE is also active in this area, but a lot more needs to be done.

Acknowledgment

The views expressed in this chapter are those of the author and not necessarily reflect the views of the United Nations Economic Commission for Europe.

Endnote

1. For more information about SPECA, see <http://www.unece.org/speca/>.

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MUCH ADO ABOUT NOTHING – SUB-BASIN WORKING GROUPS IN KUNDUZ RIVER BASIN, AFGHANISTAN

Manijeh Mahmoudzadeh Varzi & Kai Wegerich

Irrigation and Water Engineering Group, Wageningen University, The Netherlands

This chapter critically evaluates ongoing processes within preliminary sub-basin working groups in the Kunduz river basin. These working groups were set up in the context of Afghan water management reforms. The reforms aim to promote integrated water resource management and user participation in decision making. It is shown that the working groups are very far from their official aim of introducing a decision-making role for participants in the Kunduz sub-basins. To date, three years after formation of the working groups, meetings are more influenced by outside agendas. Even the invited stakeholders do not represent all the stakeholders of the basin but rather the stakeholders within local-level project sites.

1 Introduction

In Afghanistan, the water sector is in process of reform. In May 2004, the Supreme Council for Water Affairs and Management developed the Strategic Policy Framework for the Water Sector, providing principle directions for the water sector in Afghanistan (Government Islamic Republic of Afghanistan, 2008a). These policies are based on the principles of integrated water resources management (IWRM), the application of the

river basin approach, the splitting of functions from central management to a decentralized management and operation of water resources, and the participation of stakeholders in planning, decision making and management at basin and sub-basin level.

To start the implementation of this new policy, the European Commission as donor and the Government of Afghanistan as implementer initiated the Kunduz River Basin Program (KRBP). KRBP is a pilot project for the Kunduz river basin in Northern Afghanistan. One of the components of the program is integrated river basin management with stakeholder participation at basin level, but also at sub-basin level. In July 2005, KRBP started to form sub-basin working groups with pre-identified and selected stakeholders from the sub-basins. The

Corresponding author:
Manijeh Mahmoudzadeh Varzi
Irrigation and Water Engineering Group,
Wageningen University
Droevendaalsesteeg 3a,
6708 PB Wageningen, The Netherlands
Email: m.mahmoudzadeh@gmail.com;
manijeh.mahmoudzadeh@wur.nl

official aim of the sub-basin working groups is to start coordinating and to take a decision-making role in the sub-basins of the Kunduz river. Later on, these groups are supposed to be divided into two organizations: sub-basin councils and sub-basin agencies. The sub-basin councils are supposed to represent the users and to make decisions on water management, and the sub-basin agencies are supposed to represent the ministries which have a stake in some aspects of water management to supply the necessary information and to execute the decisions of the councils. Therefore, at the moment, the sub-basin working groups integrate different stakeholder groups, government agencies, users and different sectors (energy and agriculture). Hence, it is possible to compare them with multi-stakeholder platforms (MSPs).

This research aims to investigate the structure, function, and results of the sub-basin working groups in order to determine their role in the local water management system and therefore their relevance to the current water management issues in Kunduz basin. The research was conducted in the Kunduz river basin from 1 March to 22 May 2008. During this time period, it was possible to participate in two sub-basin working group meetings, one in Taloqan and one in Baghlan sub-basin; three others were cancelled during the period. Four other meetings, held among the members of sub-basin working groups, were also attended. Structured and semi-structured interviews were conducted with KRBP staff members at different organizational levels, key staff members of different governmental departments, non-governmental organizations as well as different representatives of canal communities. In addition, different KRBP reports and sub-basin working group minutes of meetings were studied.

2 Conceptual framework

Many governments have adopted, or are attempting to adopt, IWRM to govern their water sector. IWRM is defined by the Global Water Partnership (2000: 24) as “a process which promotes the coordinated development of water, land and related resources in order to maximize the resultant economic

and social welfare in an equitable manner without compromising the sustainability of vital ecosystems”. The IWRM approach promotes giving some or all decision-making power to stakeholders. New forms of institutions (councils, committees, boards) are established at river-basin level to gather different stakeholders around one table to implement IWRM. It is believed that these institutions, often referred to as multi-stakeholder platforms, “reflect the same variety of interconnected social uses and users that IWRM tries to deal with” (Grigg, 1996, quoted in Warner, 2007: 3). Steins and Edwards (1998: 1) define an MSP as a “decision-making body (voluntary or statutory) comprising different stakeholders who perceive the same resource management problem, realize their interdependence for solving it, and come together to agree on action strategies for solving the problem”. Alaerts (2003: 37) describes the ideal situation in which “stakeholders are represented and empowered to play a major role in the planning and coordination of basin activities”.

Stakeholder identification and analysis addresses the question of who, how and to what degree individuals or groups may affect or be affected by the problem and its possible solutions. “Stakeholders are individuals, groups or institutions that are concerned with, or have an interest in the water resources and their management” (World Bank 2003, quoted in Warner 2007: 11). Mitchell highlights the problem by pointing out the importance of including “different priorities” due to “different spatial interests” in addition to “different sectoral interest” (2007: 60). Moreyra and Wegerich (2005: 9) highlight the fact that representatives may not represent the whole but only parts of the community, and that the top-down selection of representatives may exclude other voices within the community. If MSPs are not merely a place to talk about water problems and issues, but rather, as Oré (2007) defines them, a venue to negotiate water resource management problems, it is important to give different stakeholders a real voice/stake. Therefore, Warner (2007: 8) suggests that with giving “allocated seats to different groups [...] the idea is to give voice to weaker or smaller interests that would otherwise be

outvoted.” Barham (2001) questions whether these stakeholder platforms are broadly democratic, since there are no social and political institutions in place that could assure this.

Still the assumption is that the topics discussed in an MSP are relevant to all the stakeholders. Moreyra and Wegerich (2005) show that both easy and contested issues may arise as topics in the MSP. They (2005: 10) show for their study that when easy issues are addressed rather than the real, contested issues, participants lose interest.

Last but not least, to identify the relevant stakeholders, one has to know the boundaries of the affecting or affected groups. Wester and Warner (2002) argue that the determination of boundaries is influenced through political processes. Not only political processes, but also practical considerations, determine the boundaries.

3 Background: Afghanistan, Kunduz and Afghanistan water law

With the invasion of 2002 and the subsequent attention of the international community, concepts of IWRM and user participation at basin level came onto Afghanistan’s water management agenda. The

new policy framework of Afghanistan’s Ministry of Energy and Water calls for the basin approach and suggests the natural boundaries of rivers for the planning, development and management of the water resources. In the water sector strategy, five river basins have been identified in Afghanistan (Government Islamic Republic of Afghanistan, 2007) as shown in Figure 1. All of these river basins are transboundary basins and only their upstream parts are located within the territory of Afghanistan.

As a result of donor activity in relation to water resources, a new water law was first drafted in 2005 by the Ministry of Energy and Water and gained approval of the cabinet in April 2008, but still has to be passed by the parliament of Afghanistan. The German Gesellschaft fuer Technische Zusammenarbeit (GTZ) water sector reform project provided consultants’ services to the Ministry of Energy and Water to assist in writing the new water law. In addition the Kunduz River Basin Program (KRBP) has been launched as a pilot water management project. The Landell Mills development consultancy company contracted by the EC is implementing KRBP. Some of the components of KRBP are river basin water management, irrigation asset development

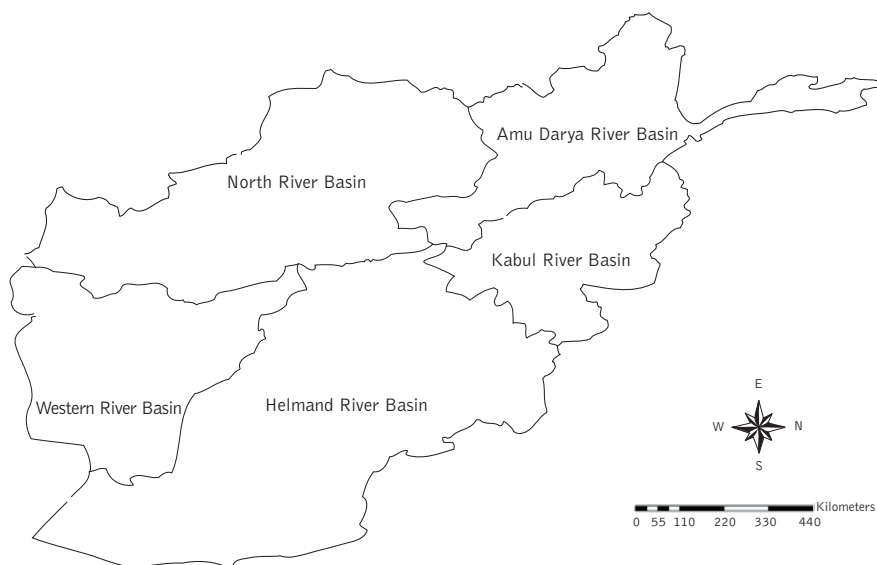


Figure 1: Afghanistan divided into five river basins. Source: Favre and Kamal (2004)

and community based water management (KRBP, 2005a). KRBP was able to contribute to the drafting of the water law by bringing in field-level experience (GTZ team leader, 21/04/2008), mainly the experience of the Aga Khan Foundation (AKF) participatory management of irrigation systems (PMIS) (PMIS coordinator, 16/04/2008).

The Kunduz river, a southern tributary to the Amu Darya river, is located in the north of Afghanistan. The Amu Darya is a border river between Afghanistan and its northern neighbours. To the present day, the amount of water that Afghanistan contributes to the Amu Darya basin is contested (Wegerich 2008), although in 1977 an Afghan delegation claimed the right to 9 km³ of the Amu Darya in Tashkent. At that time, the Soviet Union suggested 6 km³ (personal communication Dukhovny 02/09/2008). One decade later in 1987, the Soviet Central Asian republics (Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan) divided the water among them, assuming that Afghanistan would utilize only 2.1 km³, which was lower than what was already being used in 1965, namely 3.85 km³ (Qaseem Naimi, 2005). To date, the cooperation between the former Soviet Republics and Afghanistan on water resources is limited (Horsman, 2008).

The Kunduz river has two main tributaries, the Baghlan and the Taloqan. These two rivers join the Kunduz river downstream of Kunduz city. After the confluence of the two rivers, the river is called Kunduz river. Including the two tributaries, the Kunduz river basin has an area of 35,000 km² (KRBP, 2005b). Within the Kunduz basin there are different administrative boundaries (provinces and districts); within the basin fall parts of Baghlan, Takhar, Bamyan, Samangan and Kunduz provinces. In addition, the Kunduz basin is divided into three sub-basins, the Taloqan, Baghlan and Doushi-Bamyan sub-basins (see Figure 2). In the Kunduz basin there are 213 canals. Rout (2008) distinguishes between formal and informal canal management systems. Informal systems account for 90 percent of the country's irrigated area. He (2008: 13) describes the infrastructure of these systems: "Canals are generally built with unlined

earth wherever site and soil conditions are suitable and, when necessary, stone slab or stone masonry. Simple earth structures and bunds are constructed for water diversion from rivers and streams". These earthen structures are very vulnerable to flood damage.

In order to implement a high degree of stakeholder participation, the new water law gives the mandate for water management to river basin councils. According to the draft water law (Government Islamic Republic of Afghanistan, 2008a) the planned councils will consist of "water users representatives, involved central and provincial departments and other involved groups in the basin" (Article 13, Paragraph 1). The Ministry of Energy and Water is supposed to establish the river basin councils. The ministry "may, after conduction capacity building with necessary technical training, gradually delegate some of its powers to river basin councils [...], when appropriate" (Article 13, Paragraph 2). Therefore, even after the ratification of the water law, it is undetermined when the councils will gain their mandate. As long as the river basin councils do not have a mandate, different governmental departments, including the Ministry of Energy and Water, will retain their power (Article 12). In the law, a similar approach is taken for sub-basin councils.

The planned water management reform can be summarized as shown in Figure 3.

The establishment of the planned basin organizations in Kunduz is part of KRBP's river basin water management component. As the water law is not passed yet, KRBP started establishing sub-basin working groups as "precursors of organizations that will be formed once the water law is enacted" (KRBP team leader, 10/02/2008).

The Draft Water Sector Strategy and the Draft Water Law emphasize a high degree of stakeholder participation in water governance in rural areas. However, although the Afghan Draft Water Sector Strategy (Government Islamic Republic of Afghanistan, 2007: 11) emphasizes the importance of law, it also highlights the difficulties of

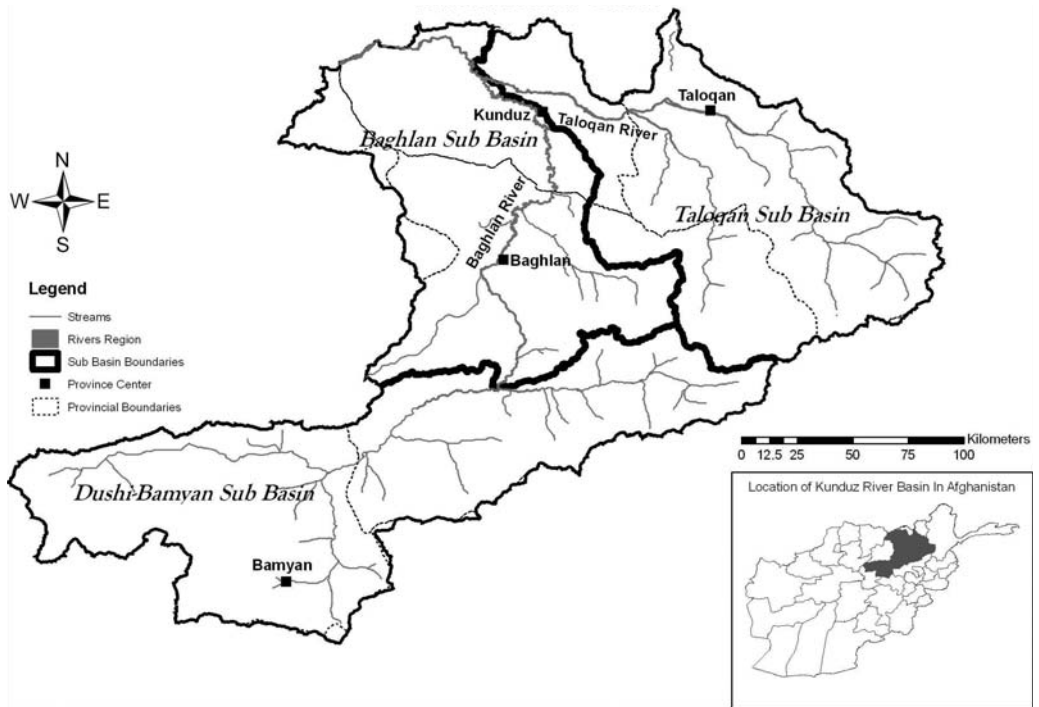


Figure 2: Kunduz River basin and its three sub-basins. Source: KRBP map archive

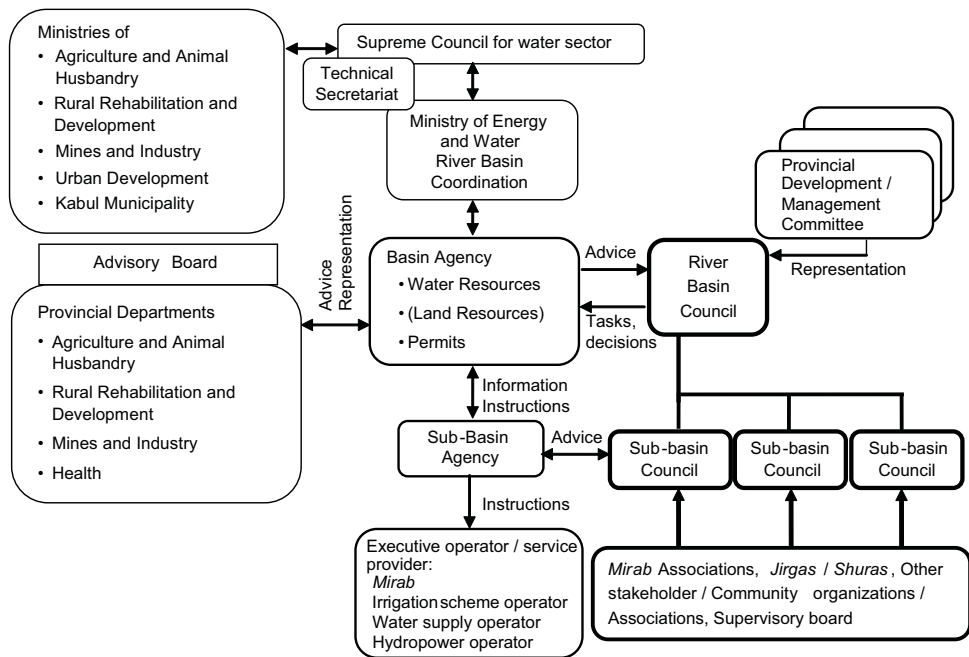


Figure 3: River basin institutional arrangements. (Source: KRBP, updated from Draft WSS October 2007: 20, but this figure is missing in the Draft WSS February 2008)

implementing the law: “Unlike the social-political situation that existed in the past, strict enforcement of any enacted water law may present an immediate problem in the rural areas of the country. Not until an effective governance system is re-established in outlying provinces can any law become effective. These enforcement constraints are expected to influence and diminish the development of desired achievements: Their resolutions are extremely time dependent as the Ministry of the Interior re-establishes a national policing capacity”. In a later draft of the Water Sector Strategy (Government Islamic Republic of Afghanistan, 2008b) a clear distinction is made between urban and rural water management. Whereas for the urban areas the emphasis is on rule enforcement, for the rural areas reference is made only to governance. Thomas and Wegerich (forthcoming a) reveal that, for one canal in the Kunduz basin, even the locally accepted canal-level governing body is in need of higher level support for rule enforcement. Hence, focusing on governance alone is inadequate in the Afghan context. The context is determined by various ethnic minorities, different power brokers and the disintegrated management of water resources at canal level from the time of the Russian invasion (1979) up to Taliban rule.

4 Case study: the Kunduz river sub-basin working groups

On 19-20 April 2005 in Kunduz, a workshop was held on river basin management. At that time, the river basin organizational set-up was discussed. The meeting was attended by different governmental organizations and a few *mirabs* (the canal service providers in Afghanistan’s traditional irrigation systems). It was reasoned that one organization at basin level would be too large to be effective; therefore it was decided that the basin should be split into sub-basins and that in each sub-basin a working group would be established. However, the Kunduz river basin consists of seven rivers and about 50 smaller watercourses. It would have been uneconomical to have a sub-basin authority for each sub-basin. It was decided to establish only three sub-basins: Dushi-Bamyān, Baghlan and Taloqan (KRBP, 2005a). The boundaries of the new sub-basins do not coincide with those of the administrative units.

4.1 Setting the boundaries of the sub-basin working groups

The area within the Taloqan catchment forms the Taloqan sub-basin (12,919km²). The Baghlan river catchment covers a vast area of 28,441km². It was decided to split the Baghlan sub-basin into two sub-basins; the downstream sub-basin was named Baghlan and the upstream sub-basin, Dushi-Bamyān. During an interview (04/03/2008) with the GTZ team leader, different reasons were mentioned for splitting up the Baghlan sub-basin. Some of these reasons are logistical and some relate to water management activities. According to him, the Dushi-Bamyān sub-basin has clear characteristics of an upper catchment with steep slopes and agricultural lands concentrated in narrow valleys. The downstream Baghlan sub-basin has flatter lands. It is believed that different land characteristics will need different water management activities. The implication is that it is not water boundaries that are considered, but the different engineering activities required to tame the water. Logistical considerations mentioned include the cost of transport to attend meetings, the number of council seats and the anticipated income through fee collection. The explanations given suggest that setting boundaries is not as straightforward as the literature on IWRM suggests.

Ironically, as it is defined in the EC contract, KRBP is only active in three provinces: Kunduz, Baghlan and Taloqan. Part of the Dushi-Bamyān sub-basin is located in Bamyān Province and therefore it is outside the scope of the EC contract (KRBP team leader, 31/03/2008). The implication is that even the EC did not consider hydrological boundaries for IWRM in the Kunduz river basin but, rather, focused on administrative boundaries.

4.2 Who participates and why

Line provincial governmental bodies are represented in the sub-basin working groups. *Mirabs* are also invited as representatives of agricultural water users. KRBP suggested the relevant governmental participants of these groups on the basis of discussions with line departments at the April workshop (KRBP team leader, 20/05/08).

Table 1: Sub-basins of the Kunduz river basin

SUB-BASIN	PROVINCES SHARING THE SUB-BASIN	TOTAL AREA (km ²)	IRRIGATED AREA UNDER KRBP		NUMBER OF CANALS UNDER KRBP
			(ha)	(ha)	
Taloqan	Takhar, Kunduz, Baghlan	12,919	99,649	23,664	14
Baghlan	Baghlan, Kunduz, Samangan	11,971	109,483	46,468	19
Dushi-Bamyan	Baghlan, Bamyan	16,470	23,316	0	0
Total in Kunduz basin	Five provinces	41,360	232,448	70,132	33*

* Out of 213 canals

It was also decided to give the role of chairman to the directors of water management departments.

The members of sub-basin working groups are suggested in the terms of reference for the sub-basin working groups (KRBP, 2005a). The fact that out of nine members, only one user representative is anticipated in this membership list highlights the strong emphasis on governmental departments and an under-representation of the users, whether industrial, urban or agricultural. Furthermore, the list suggests that there are clear representatives identified to represent the users and that these representatives represent all the different sectors. However, this trend was partly revised later. In the second meeting it was decided to invite *mirabs* as farmers' representatives, but their invitation arrangements were only prepared from the eighth meeting onwards. Initially, KRBP asked the individual provincial water management departments to invite *mirabs* from their respective provinces. The reason for this is that the water management departments register *mirabs* after their annual elections. Hence, they know all *mirabs* in their respective provinces. However, the water management departments were not able to invite the *mirabs*, so KRBP took the initiative and invited the *mirabs* from its project area (KRBP team leader, 31/03/2008).

The reason for approaching the *mirabs* relates to the program itself. When the sub-basin working

group meetings started, water users' associations or committees were not yet formed and the program did not have access to the water users (PMIS coordinator, 24/04/08). According to the KRBP team leader, *mirabs* are believed to be good representatives of their canals. They are perceived as being skilful and knowledgeable water service providers in their canals (31/03/2008). However, recent research shows that *mirabs* may not represent the whole canal unit; they are selected by the most powerful land users, and therefore do not represent the spectrum of water users within the canal (Thomas & Wegerich, forthcoming b). Furthermore, Thomas and Wegerich (forthcoming c) show that *mirabs* do not provide an organized service; rather, water allocation to different farmers within one canal is ad hoc.

At the time of the research, *mirabs* participated in the meetings as water users' representatives. In the whole Kunduz basin, there are 213 canals, but only 33 canals (30 percent of irrigated land) are covered by KRBP and therefore within the scope of NGO activities in relation to social water management (German Agro Action and AKF PMIS). Many *mirabs* are invited through the NGOs (KRBP counterpart from the Ministry of Energy and Water, 26/04/2008). *Mirabs* of canals that are not covered by NGOs are not invited. However, they can attend if they find out about the meetings.

Figure 4 shows the participants and their role in the groups.

In the fifteenth working group meeting, the composition of the future sub-basin councils was discussed. The decision was made based on the previous meetings in which the different categories (sectors) of water use in the sub-basins were classified. Moreover, the water use of different sectors, determined by KRBP, was also taken into account. Table 2 shows the result of this meeting.

There are some ambiguities in Table 2 when it comes to the allocation of seats. For example, it is not evident why 93 percent of water use is represented by 17 seats, forestry which uses nearly 7 percent receives one seat, and all other sectors using less than 1 percent receive seven seats. In addition, the distinction made within the agricultural sector is unclear. The different areas identified are either districts, parts of districts or even only canals; hence there is no clear distinction about their water utilization. The most striking example is the Asqalan canal which has two seats. This canal has an irrigated area of only 3,000 ha. However, for example the Baharak and Khoje-ghar districts have in total an irrigated area of 13,000 ha and have also two seats.

Moreover it is not known why fishing and herding water use is only considered for one district since they are practiced in most parts of the basin. In addition, even the environmental water uses are just considered for one district. Given the security situation in Afghanistan, it is questionable why a seat is allocated to the tourism sector.

Overall, it seems that it is unclear who should represent these different identified stakeholders, given that some classifications, such as Mining, Transport and Trading, or Environment and Tourism, represent different interest groups that might even have conflicting interests and concerns. In addition, currently, a *mirab* represents only one canal, hence it is questionable how these different canals would select one representative for a whole area, including different canals.

Given that at this meeting not all the different users were represented and that, in the future sub-basin councils, governmental organizations will not be present, the decisions about seat allocation seem arbitrary. At a different presentation, the randomness of the seats became more obvious. The director of the Takhar water management department realized that the Khost and Fering districts were not represented in the table. So he decided to take one seat away from Asqalan canal and give it to these two districts.

4.3 Meetings and attendance at the sub-basin working groups meetings

Since July 2005, KRBP has been organizing the sub-basin working group meetings, sometimes with the assistance of the GTZ water sector reform project. From the eighth meeting onwards, a membership list was prepared. Originally, the introduction of a membership list was intended to make the meetings more official and to let the organizations know which member of staff should be sent to the meetings. Usually the highest official in each government department is a member of a working group. The KRBP counterpart from the Ministry of Energy and Water explained (09/03/2008) that the key persons or directors can play a more effective role in the meetings than other staff members of the government departments. However, the selected members often assign other staff members to participate in the meetings.

The minutes show that the persons representing the government departments change frequently. The reason for this is that invitation letters for the group meetings are sent out to the government members very late. By the time the government members are informed, they often have other meetings to attend. Besides, within the government departments staff members are often moved from one position to another.

In addition to these frequent changes, it was explained in the Takhar Rural Development Department that the participants either do not report back at all, or report only orally to their director. Consequently, there are no internal

Table 2: Composition of future Taloqan sub-basin council. Source: SBWG Taloqan minutes of fifteenth meeting

WATER USER	NAME OF IDENTIFIED PLACE	SEAT REPRESENTS A ...	WATER USE (%)	NO. OF SEATS
Fishing and Herding	Farkhar district	sector	0.3	1
Environment and Tourism	Worsaj district	sector		1
Drinking Water and Health Centres	-	sector		1
Mining, Transport and Trading	-	sector		1
Municipality and Education Centres	-	sector		1
Forestry	-	sector	6.95	1
Electricity	-	sector	non-consumptive	1
Women	-	gender	-	1
Large-scale agriculture	Taloqan river's left bank	area	92.75	1
	Taloqan river's right bank	area		1
	Kunduz	area		1
	Eshkamesh, Chal, Namakab	districts		1
Small-scale agriculture	Bangi, Siab Bangi	district, village		1
	Khatayan, Ahandare	parts of districts		1
	Saraysang	part of district		1
	Qara Parchaw, Abdal, Takhte Kabarak	villages		1
	Baharak	district		1
	Khoje-ghar	district		1
	Taloqan river's left bank	area		2
	Khanabad	district		2
	Asqalan	canal		2
Aq tapa	canal	1		
Total		-	100	25

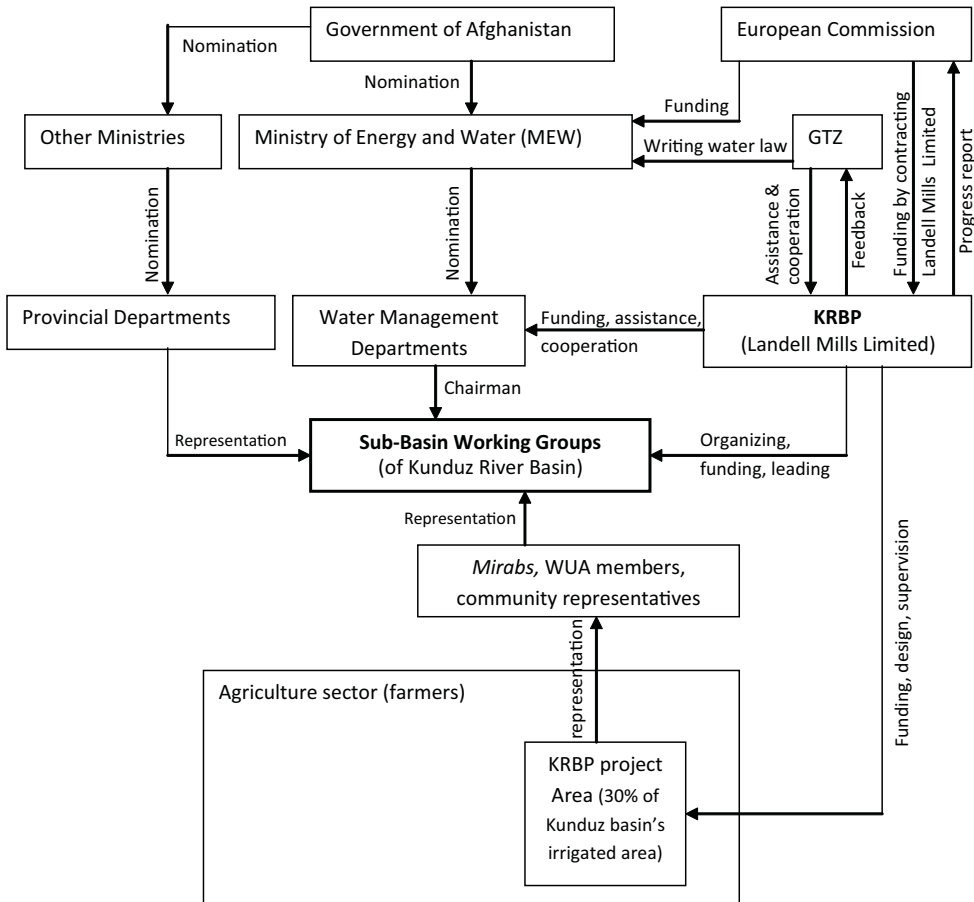


Figure 4: Roles and driving forces for river basin management in the sub-basins

documents within the department describing the development of the meetings. In addition, even though the minutes of meetings are given to the attendees at the following meetings, within the governmental organizations it was difficult to trace what happened to these documents. Hence, there are also no external documents available for the different participants to show them how the meetings progressed. More or less the same situation exists in other government departments.

Similar to the governmental organizations, the *mirabs* do not attend that often either. After attending a few meetings, *mirabs* lost interest in the meetings saying: “it is just a lot of talking” (KRBP counterpart from Ministry of Energy and Water, 26/04/2008), but, when KRBP construction

works started in different canals, *mirabs* started to participate again because they saw the meetings as a place to ask for help from KRBP and also to complain about the work of contractors (KRBP counterpart from Ministry of Energy and Water, 26/04/2008; PMIS coordinator, 24/04/2008). In addition, PMIS informs water user association members and *mirabs* about the meetings, and then brings the interested people to the meetings. Therefore, from one canal or area it is not the same persons who attend the different meetings.

Many government participants do not even know that they are members of a particular working group. Only the directors of the water management departments could name the sub-basin working groups correctly. Other governmental participants

did not even know the name of the sub-basins, and only mentioned the cities in which meetings were held, or confused the meetings with other KRBP meetings. Similarly, the *mirabs* did not know which meetings were being referred to if only the name of a certain sub-basin working group was given. Even with more explanation, they confused them with other meetings, such as meetings in the water management departments.

4.4 Sub-basin working group's agenda and its relevance for the members

According to the terms of reference for the Kunduz river basin working group, the focus of the groups should be on finalization of a river basin profile, developing a strategic plan, developing an annual plan, carrying out river system modelling, and suggesting proposals for the development of river basin management organizations.

However, according to the GTZ team leader (04/03/2008): “the meetings are supposed to transfer the idea of reform to lower levels and to create ownership”. This statement can be put into question as the KRBP team leader always sets the meeting's agenda. Therefore the agendas for the three sub-basins are identical. The headings of the different meeting agenda points suggest that the meetings are participatory in nature. However, when minutes of the meetings are analysed, it becomes evident that the meetings are dominated by KRBP staff presentations, with only a few group discussions.

Even though one could interpret the group discussions as a kind of future planning for the sub-basin councils, the GTZ team leader referred to group works as “exercises” which should be repeated once the water law is enacted and the councils are formed (04/03/2008). The EC delegation task manager stated: “the groups are not legally formal so if they make a decision they cannot implement it, which will frustrate the members” (17/03/2008). Hence, the working groups are perceived as a training venue by the international parities involved rather than a decision-making body, although it is claimed otherwise.

However, already within the province it seems that the decisions of the working groups are not considered. An example is the drought situation of spring 2008. Even though before the drought occurred, one working group session in Taloqan (01/04/2008) had water sharing in drought situations on the agenda, and it was decided where to prioritize and how to share water, when the drought actually came the director of the Takhar water management department decided ad hoc on a rotational plan for the different canals, ignoring what had been debated in the working groups and the information provided by KRBP. However, his decision was accepted and signed by canal *mirabs*. Thomas and Wegerich (forthcoming a) show that the water management department as well as the governor of Takhar had some problems enforcing the rule. Nevertheless, the example highlights the fact that basin problems are in practice still dealt with in the traditional way and by the main power player, the water management department. The example puts into question whether there is an actual need for the new organisations (councils) to be set up.

Even though KRBP does not ask the participants to bring their own points to the agenda, the *mirabs* introduce their own issues. For example, in the eighteenth Baghlan meeting, the *mirab* of Jangaroq complained about the quality of construction works in his canal supervised by KRBP and asked KRBP engineers to come and stop the contractor. But *mirabs* from outside the KRBP project sites also bring their agendas to the meetings. An example is the *mirab* of Gorgorak canal who is not a member of any sub-basin working group. Although he is never invited, he always attends the meetings to bring attention to his canal (KRBP counterpart from the Ministry of Energy and Water, 26/04/2008). In the eighteenth Baghlan meeting he took any opportunity to shout “but what about the 14,000 *jeribs* (2,800 ha) under Gorgorak canal which are left without water?” (sub-basin working group Baghlan minutes of the eighteenth meeting). These examples show that the *mirabs* who are within the KRBP project see the sub-basin working group meetings as a place to raise the problems experienced in their canals. They ask for help from

KRBP and complain about contractors' slow work. *Mirabs* who are not members use these meetings to get their canals rehabilitated. This shows that, for the *mirabs*, the meetings are not about basin issues, but about problems at the canal level.

The working groups are supposed to integrate different sectors. The underlying assumption is that there are conflicts of interests. Therefore, the different participants were asked about the conflict-raising issues for individual parties and among parties. No government participant was able to mention any water-related conflict or issue. Only one *mirab* from the Taloqan sub-basin mentioned a problem between different sectors, a salt mine which makes the water in one of his canals (the Shurab) salty and unsuitable for agriculture (*mirab* Nazar Mohammad, 11/05/2008). On the other hand, NGO staff members seem to have a clear understanding of the topics of concern. KRBP engineers (12/04/2008) mentioned water sharing between different canals within one river. The PMIS coordinator (24/04/2008) mentioned conflicts between farmers and mill owners (see also Thomas & Wegerich, forthcoming a). In addition, the PMIS coordinator mentioned the consequences of new construction work, such as the joining of two canals with one headwork in Baghlan province. However, with the exception of the topic mentioned by the PMIS coordinator, the other topics were not raised in the meetings.

The members have different opinions about the purpose of sub-basin working groups. Of the 56 members interviewed, 25 thought that the meetings were about KRBP rehabilitation and construction works (stated by all *mirabs*). Twenty considered that the sub-basin working groups had a managing role, and four thought that its role was mainly to inform participants about KRBP activities. Six interviewees could not identify a definite purpose for the meetings, the reason being that the meetings have not yet produced any tangible results that they can relate to a certain purpose.

Overall, it appeared that the official agenda of the meetings did not address issues that were relevant for the representatives of the canal communities.

Some *mirabs* directly stated their dissatisfaction. For example, Qayoum (04/05/2008), the former *mirab* of Ajmir canal, summarized the meetings as follows: "they would talk, we would eat the lunch and then we would leave". *Mirab* Abdullhadi of the Chaman canal complained (16/04/2008) that the meetings did not have practical results. Likewise, Shah Mohammad, a member of Saeed canal WUA, stated (16/04/2008): "talking should be followed by acting". Similarly, nine of 28 government participants also mentioned the lack of practical results from the meetings and questioned the necessity of holding them. Even two high staff members of water management departments (Baghlan director and Bamyán deputy director) stated that the sub-basin working groups' work is "just on paper" and they want to see practical outcomes.

5 Conclusion

The brief description of the water law and the water policy shows that the future of the multi-stakeholder groups and their role in decision making is undetermined. It is up to the Ministry of Energy and Water to decide when the time is right to accept the role of the councils as decision-making organs. In this respect, it may not even be in the ministry's interest to make the current sub-basin working groups more functional, since this would imply that the ministry would lose power in the long run.

Given that the Kunduz basin consists of seven rivers and about 50 smaller watercourses, it seems arbitrary to establish three sub-basins – even more so since the Baghlan river is divided into two sub-basins (upstream and downstream), because of different planned engineering interventions and logistical considerations. This implies that, even though hydrological boundaries are natural, certain pre-defined categories determine whether a tributary is worthy to become a sub-basin or is within a sub-basin of a larger river. In addition, as was the case here, logistical considerations were taken into account in setting the sub-basin boundaries. Overall, given that the Kunduz river is itself a tributary of the Amu Darya, the question

arises as to whether downstream users and uses will be considered.

The presented data have shown that the identified stakeholders do not represent all the different users within the basin; in terms of invited *mirabs* they only represent the canals on which there are KRBP projects and affiliated programs (30 percent of the irrigated area in the Kunduz basin). However, it is questionable whether these *mirabs* are really representative of all the different users along their respective canals. Furthermore, the fact that only *mirabs* from KRBP project areas are invited highlights the inability of KRBP and water management departments to mobilize all users. It also puts generally into question the legitimacy of the sub-basin working groups as decision makers for the basin. In any case, if any decisions were made, it is doubtful whether they would be capable of being implemented.

Currently, KRBP determines when meetings are held, and even the agenda for these meetings, and mainly presents topics in a top-down manner. The implication is that the topics relevant to the participants are not addressed. Consequently, the participants, and specifically the canal representatives, are not interested in the set topics. However, as shown, they manage to bring up their own individual topics in the meetings (construction works). Because the topics of discussion are determined from the top down, the canal representatives may in fact continue in their own ways and address their concerns (other than construction works) directly with the relevant stakeholders, and therefore further undermine the relevance of the sub-basin working groups. The future outlook for the to-be-established sub-basin councils may therefore be negative, in that the current participants will have lost any interest in

participating in these councils, because they have learned that these meetings are not relevant for them, just time consuming.

Overall, it appears that the idea of basin management is being forced onto water organisations and water users in the Kunduz basin. The idea of water management reform is the result of donor-driven activities in Afghanistan inspired by modern discourses on basin closure and the call for IWRM. However, the Kunduz river is only a tributary of the Amu Darya. Within the sub-basin working groups, the interests of the downstream riparian states are not reflected, hence the Kunduz basin is not closed. Canal communities in the Kunduz basin experience scarcity only during drought periods. Therefore, there is very little incentive for them to attend the meetings other than to ask for, or complain about, rehabilitation work to KRBP. Furthermore, giving decision-making power to stakeholders to allocate water (scarce or not scarce) assumes knowledge about the overall amount and how much water is used. The absence of metering stations in the Kunduz basin or in the current intake infrastructure puts this assumption into question. Finally, it is continuously argued that the water law has to be accepted to give real power to the sub-basin working groups and to establish the councils, but, even if the parliament ratifies the current Draft Water Law, the instability of the security situation in the Kunduz basin casts doubt on whether it will have any influence on the ground.

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AFGHANISTAN AND TRANSBOUNDARY WATER MANAGEMENT ON THE AMU DARYA: A POLITICAL HISTORY

Stuart Horsman

Foreign and Commonwealth Office, United Kingdom

Afghanistan is a key Amu Darya riparian state. Its fellow riparians have established water management structures, which have not included Afghanistan or recognised its interests however. This paper explores why this is the case. Regional power politics and antipathy towards cooperation, institutional inertia and self-interest, Afghanistan's slow emergence from conflict, and its present limited water demands probably explain Kabul's isolation. Its participation in these structures could help it and the region's economic and environmental development and encourage cooperative processes. Afghanistan's exclusion is not at present a major political, security or environmental problem however.

1 Introduction

Two major events transformed the political geography of the Aral Sea Basin (ASB) region a decade apart. The year 1991 saw five new independent states established following the collapse of the USSR. These post-Soviet republics created their own inter-state management of the Aral Sea Basin (ASB) including its rivers. Afghanistan was not party to the process. The transition did not herald a period of greater inter-state cooperation and was not entirely positive for water management. 2002 saw the removal of the Taliban government

in Afghanistan. This was the obvious opportunity for the other riparians to recognise Afghanistan's transboundary water rights and responsibilities. The literature on both Afghanistan and regional water issues of the time reflected this expectation (Fuchinoue, Tsukatani & Toderich, 2002; Rubin & Armstrong, 2003). This did not happen however. The situation has remained relatively static since then. Consequently, in terms of regional water cooperation, both seismic shifts in regional politics have been opportunities missed.

This paper examines how and why Afghanistan has remained essentially excluded from the Amu Darya management structures despite these political changes. It will first briefly outline water supply and demand on the Amu Darya. It will then analyse the historical and contemporary ASB/Amu

Corresponding author:
Stuart Horsman
Research Analyst
Foreign and Commonwealth Office
SW1A 2 AH, London, United Kingdom
Email: stuart.horsman@fco.gov.uk

Darya regional water agreements and Afghanistan status in these. It will conclude by examining the possible reasons why Afghanistan has to a large extent been excluded and ignored.

2 The Amu Darya: Hydrological Background

The Amu Darya river is regionally important. It is the largest river in Central Asia (i.e. the five post-Soviet republics) and the second largest in terms of flow in Afghanistan. It is shared by six states, Afghanistan, Kazakhstan, the Kyrgyz Republic, Tajikistan, Turkmenistan and Uzbekistan, (seven if Iran and the terminal river, Tedjen, it shares with Afghanistan and Turkmenistan is included). It rises in Afghanistan, the Kyrgyz Republic and Tajikistan. The river then flows for 2,400 km through these states, Turkmenistan and Uzbekistan before terminating in the Aral Sea. For a detailed analysis of the ASB and Amu Darya's hydrology, the Aral Sea problem and water use patterns by state and sector see Micklin (1991a, 2000 & 2006).

Table 1: Flow and withdrawals from the Amu Darya¹

	AVERAGE ANNUAL FLOW (KM ³)	WITHDRAWALS (KM ³)
Afghanistan	17.0	5 est.
Iran	< 3	NA
Kyrgyz Republic	1.6	0.15
Tajikistan	49.6	7.9
Turkmenistan	1.5	22
Uzbekistan	5.1	22
Aral Sea	-	9.3
Total	79	66.35

Sources: Glantz, 2005; Micklin, 2000; Ahmad & Wasiq, 2003.

The Amu Darya river is an important source of water for all the riparians (See Table 1 and Table 2). Agriculture, a key economic sector in all of the states, is the main user. More than 90% of the ASB's crops are produced on irrigated land for example (Micklin, 1991b, p 217). Uzbekistan has the largest

area under irrigation, followed by Turkmenistan and Afghanistan (See Table 2). All of the Amu Darya states have plans to increase the amount of land under irrigation (Micklin, 2006, p 560). Cotton remains a key irrigated crop for Tajikistan, Turkmenistan and Uzbekistan, although its GDP share is declining in all of these states (EIU, 2007; 2008b). Their reliance on cotton agriculture has "profound political, economic and social consequences" with mutually reinforcing links to these states' "lack of political openness, failure to reform economies, large-scale poverty and social deprivation" (International Crisis Group, 2005, p 1).

Table 2: Irrigated Land in the Amu Darya Basin

	IRRIGATED LAND IN AMU DARYA BASIN (MILLION HA)
Northern Afghanistan	1.16
Iran	-
Kyrgyz Republic	0.1
Tajikistan	0.5
Turkmenistan	1.7
Uzbekistan	2.3
Total	5.76

Source: USAID, 2002 quoted in Ahmad & Wasiq, 2004, p 26.

Traditionally most of the policy and academic interest on the river has focused on the Central Asian riparians. Afghanistan has generally been ignored although there have been notable exceptions such as the "Water, Climate, and Development Issues in the Amu Darya Basin" workshop in Philadelphia 1992. This is however understandable given that collectively these states are the majority of the riparians and the largest water users. However Afghanistan cannot be ignored. It is the second largest contributor to the river after Tajikistan, contributing nearly a quarter of the river's 79 km³ flow (Ahmad & Wasiq, 2003). Northern Afghanistan accounts for 15% of Amu Darya basin area and 17 % of its population (Micklin, 2000, p 4). Afghanistan is also the source of other ASB rivers, the Atrek, Murghab and Tedjen. All three

terminate in Turkmenistan, although the Tedjen also travels across Iran.

The Amu Darya is an equally important asset for Afghanistan. For half of its length, it flows either inside Afghanistan or along its border (Ahmad & Wasiq, 2003, p 10). Between 13-40% of Afghanistan's area and more than 25% of its population are within the river basin (Glantz, 2005, p 26; Micklin, 2000, p 4, Ahmad & Wasiq, 2003). The Amu Darya area is the most agriculturally productive in Afghanistan, containing 1.16 million ha of irrigated land (a third of country's total). Only 385,000 ha of this are in sub-basins with permanent flow to the Amu Darya however (Ahmad & Wasiq, 2003, pp. 2-17).

It is worth noting at this point there are considerable variations in the hydro-data on Afghanistan. Caution must be exercised when using these statistics and the conclusions based on them. Contemporary information on Afghanistan's water flows and withdrawals does not exist. Estimates are based on 1960-1970's information. In the intervening period, war has caused population movement and a collapse in agriculture including the destruction and lack of maintenance of its irrigation systems. Afghanistan's hydrological data acquisition has also been effected reductively. In addition various studies define the Amu Darya catchment differently. Some include the terminal rivers for example.

An additionally important use of the Amu Darya for Tajikistan and potentially Afghanistan is Hydro-Electric Power (HEP). At present more than 90% of Tajikistan's energy generation comes from HEP. (EIU, 2008b) Before 1979, Afghanistan may have only developed approximately 10% its HEP capacity. These schemes fell victim to the country's thirty years of conflict however (Ahmad & Wasiq, 2003). Tajikistan's use of the Amu Darya for HEP generation (and Kyrgyz Republic on the Syr Darya) has led to disputes with Uzbekistan (and Kazakhstan) who prioritise irrigation withdrawals (Horsman 2001, p 75; Wegerich 2004, p 341).

3 Afghanistan and the Region's Water Management Structures

For more than a century Afghanistan and its northern neighbours, Russia, the USSR and Central Asian states, have concluded agreements relating to the Amu Darya. Afghanistan's right to an equitable allocation of the river has not been fully recognised by any of these however. Before 1991, Afghanistan and Russia/the USSR reached a number of relevant agreements, some of which are still in force. There was also a series of internal Soviet decrees with implications for Afghanistan. Since then the five post-Soviet states have established new institutions. However recognition of Afghanistan's legitimate water rights and responsibilities by its fellow riparians has not improved since 1987 and possibly not since 1958. Neither the Central Asian states' independence nor the establishment of the Karzai government in Kabul were seized as an opportunity to recast regional water structures.

Given the subsequent failure to include Afghanistan in post-1991 management structures it is worth noting the Amu Darya featured significantly in Russian/Soviet agreements with Afghanistan. The key agreements were:

- *Frontier Agreement Between Afghanistan and Russia, 1873.*
- *Frontier Agreement between Afghanistan and the Union of Soviet Socialist Republics, 1946, and*
- *Treaty between the government of the Union of the Soviet Socialist Republics and the Royal Government of Afghanistan concerning the regime of the Soviet-Afghan state frontier, 1958. (DGIA, 2001).*

All of these agreements primarily focused on the river as an international boundary. They also dealt with navigation, and water quality issues and usage such as irrigation. Water quotas were not directly addressed. It has been suggested that this was because Afghanistan's water withdrawals were so small that they were not considered an inter-state issue (Ahmad & Wasiq, 2004, p 40).

Collectively, the agreements are relevant for the present debate however. In particular they indicate that the USSR saw a necessity in negotiating with Afghanistan over the Amu Darya as a shared resource as well as a common boundary. The 1958 Treaty is perhaps the most significant. It stated that each party “*shall take measures to ensure that in the use of frontier waters, and the waters of the rivers that flow to the frontier or into the frontier rivers ... the mutual rights and interests of both Contracting Parties [sic] are respected*” (Article 7). It also declared that “*questions concerning the use of [frontier] waters ... shall be governed by special agreements between the Contracting Parties*” (Article 16), the parties should exchange information about “*frontier water*” levels and volumes (Article 17) and agree on water diversions (Article 18) (DGIA pp. 139-40). A subsequent 1961 agreement banned any constructions on the Panj and Amu Darya without consultation with the other party (Ahmad & Wasiq, 2004, pp. 38-9).

During the 1980s a series of internal Soviet resolutions established quotas for the Central Asian SSRs. The key Amu Darya agreement was Protocol 566 of September 1987. This authorised 61.5 km³ of water to be extracted by the four Soviet SSRs. Significantly it included the assumption that Afghanistan extracted 2.1 km³ from the river (Ahmad & Wasiq, 2004, pp. 33-4). It does not appear that Kabul, by then a client state, was consulted however. Before the Soviet invasion Afghanistan had sent a delegation to Tashkent to prepare a water sharing agreement. However no agreement was reached. (Qaseem Naimi quoted in Rycroft & Wegerich, 2008.)

After independence the Central Asian states as successor states to the USSR inherited the rights and responsibilities of the previous but extant agreements (Ahmad & Wasiq, 2004, p 39). Thus they became signatories to the 1873, 1946, 1958 and 1961 agreements all of which remain in force.

In addition the Central Asian states established a series of regional institutions and agreements with the expressed intention of allocating the ASB's waters and protecting the Aral Sea. They began

with the 1992 Almaty Agreement. With this the five states accepted that “*only [through] unification and joint coordination of action*” could the region's water crisis be managed effectively (O'Hara, 1998, p 13). Under the agreement, they retained Protocol 566's allocation quotas, refrained from projects infringing on other states rights and promised an open exchange of information. (O'Hara, 1998).

In the following years a number of institutions were established. These were the Interstate Coordinating Water Commission (ICWC), the subordinate Amu Darya and Syr Darya Basin Management Authorities (BVOs), the Interstate Council on Problems of the Aral Sea Basin (ICAS) and the International Fund for the Aral Sea (IFAS). Institutional reforms resulted in the ICWC being subsumed into the ICAS, and it subsequently integrated into the IFAS. It was hoped that the merger, in 1997, would simplify administrative procedures, and reduce duplication of effort and bureaucratic inertia (Micklin, 2000). This was a rare sign of the states' awareness of the serious nature of the ASB crisis and the need to coordinate their response more effectively. The Central Asian states also agreed to adhere to international water law. In doing so they accepted a normative body that supports “*equitable, reasonable and mutually advantageous water resource use*” and by implication Afghanistan's interests in the Amu Darya (Wegerich 2004, p 339; Vinograd & Langford, 2001, quoted in Weinthal, 2006, p 18).

Afghanistan has not been a member of any of these organisations however. There is no evidence that the Central Asian states or the water bodies established have ever considered including Afghanistan. The author of this paper is not aware of any public discussion of Afghanistan's membership of IFAS at its foundation, when it was merged with the ICAS or after the Taliban's removal. There is one 2003 media reference to Afghanistan plans to join IFAS (Kirby, 2003). It is unclear whether there was substance to the story however and if so why the plan never came to fruition. In fact Weinthal argues that “*the Central Asian [successor states] were quite adamant that Afghanistan should not be included in the new institutions*” (2006, p 18).

References to Afghanistan by IFAS are fleeting and not positive. The only reference to Afghanistan on IFAS's own website is on a map. This simply shows that northern Afghanistan is within the ASB (IFAS website, 2008). There is no textual reference to the fact that Afghanistan is an ASB state or contributor to the Amu Darya's waters. In a presentation at the 3rd World Water Forum, the chairman of IFAS's Executive Committee (EC-IFAS)², Sirodjidin Aslov, for example mentioned potential cooperation with Afghanistan only once. This was not within the IFAS structure either but as part of a potential bid to seek a UN mandate for the regional water management bodies (Aslov, 2003a). Similarly in a report recording IFAS's first ten years, Afghanistan was only mentioned as a potential problem. The report stated that Afghanistan's future water demands are a "big uncertainty" for the other riparians (Aslov, 2003b p 18). A subsequent ICWC-IFAS roundtable noted that there was a need for "concerted actions to develop the water management system in the region, ... due to the development of new irrigable lands in Afghanistan" (ICWC, 2005). In neither instance did IFAS or member states suggest that Afghanistan's membership was a way of addressing these "uncertainties."

No bilateral agreements have been reached between Afghanistan and the Central Asian riparians either. In fact the only transboundary water agreement that the Karzai government has with any of its neighbours is with Iran over the Helmand (Hirmand) river (Government of the Islamic Republic of Afghanistan, 2007). The only Central Asian riparian that seems interested in serious dialogue with Afghanistan is Tajikistan. The two states held three water-related meetings in 2006-7 (ENVSEC 2007). Although it is hard to assess the substance behind the meetings' rhetoric, participants from both states called for transboundary cooperation (GoA, UNDP & UNEP, 2007). Their bilateral dialogue is interesting because there are strong political and water-related synergies between them. These are discussed below.

4 Reasons for Afghanistan's exclusion

The absence of Afghanistan from IFAS and the Amu Darya BVO seems a serious omission on practical and legal grounds. Afghanistan's exclusion runs contrary to the spirit if not wording of IFAS and Central Asian riparian regulations and declarations. IFAS's regulations for example state that the organisation takes account of "the interests of all the states of the region" (IFAS Regulations, 2008).

4.1 Practical Reasons

Ahmad & Wasiq (2004) argue Afghanistan has been absent from Soviet and post-Soviet allocation agreements because its past and future water demands have been and will be modest. They believe that Afghanistan could technically increase land under irrigation in the Amu Darya basin by 20%. This will only raise Afghanistan's total extraction from 5 to 6 km³, still be less than 2% of the river's total supply. And this expansion could take up to two decades to achieve. Consequently they argue that Afghanistan's neighbours do not feel a sense of competition or urgency to reach an allocation agreement with Kabul (2004, pp. 3 & 41).

There is some merit in this argument. There is however debate about Afghanistan's future water demands, its ability to implement potential irrigation and HEP projects and the implications for the other riparians. The key problem is the absence of contemporary credible hydro-data to base such an assessment on. As noted earlier 20-30 year old plans and data are the source of our present understanding. Therefore Ahmad and Wasiq's (2004) analysis contrasts with that of Zonn's (2002). He believes that Afghanistan's demands could increase to 16 km³, nearly a quarter of the river's supply (2002, quoted in Rycroft and Wegerich, 2008). The magnitude of difference between 2 and 16 km³ and the implications for other water users is considerable. It is probably fair to assume that any increase in Afghanistan's demands will be gradual and slow to achieve, although at some point its neighbours will have to face this future. They may, as Ahmad and Wasiq (2004) suggest, take more than two decades to achieve.

This modest prognosis allows both Ahmad and Wasiq, and Dukhovny and Sokolov (senior ICWC staff members) to be relatively relaxed about the impact of Afghanistan's future water requirements on the rest of the region, especially as most of its summer withdrawals will be returned to the system and re-used by downstream states (2004, p 3; 2003, p 33; Wegerich, 2004, p 336). "Thus the impact of increased withdrawals in Northern Afghanistan on [Turkmenistan and Uzbekistan] ... would be negligible, and if any likely to be felt only during the dry years." (Ahmad & Wasiq, 2004, p 3). The need for Afghanistan's membership of IFAS is therefore not a priority they argue.

On a purely technical and rational basis Ahmad and Wasiq's, and Dukhovny and Sokolov's assessments may be correct in the near-to-medium term. There are problems with these "benign" assessments however. They are based on old and partial information, although possibly the best data available. They also negate the role of agency and uncertainty. Political relations, HEP versus irrigation usage, and potential climate change dynamics are underestimated. It could also be argued that their assessments are not positivist or apolitical but conservative and pro-status quo in their construction and implications.

The mitigations that Ahmad and Wasiq (2004) suggest to lessen the impact of any modest increased extractions by Afghanistan seem optimistic at best. They suggest that water management improvements in Turkmenistan and Uzbekistan including improved irrigation techniques and reduction in the area under cotton and rice production could be the answer (Ahmad & Wasiq, 2004, pp. 30-31). It is unlikely that the self-interested and irrigation-dependent Turkmenistan and Uzbekistan will modify or improve their water usage unilaterally and voluntarily in response to another riparian's increased water extraction. (They may do so if Afghanistan's actions result in water scarcity, something Ahmad and Wasiq suggest is not likely.) Any improvement in irrigation techniques would be very expensive, probably in the US\$ billions and beyond the "willingness and ability of the basin states." (Micklin, 2006, p 560). Crop substitution

may be more feasible. Both Turkmenistan and Uzbekistan have done this. This however has been for their national food security objectives not for reducing water use per se. There "are limits to such a program" too as both states continue to see cotton as a key hard currency source (Micklin 2006, p 560).

Other factors question these benign assessments too. The Amu Darya is already heavily utilised. All of the riparians, not just Afghanistan, have plans to increase water extraction. (Micklin 2006, p 560). Therefore Afghanistan's future water demands, whether it is 6 or 16 km³, must be seen in the broader context of an already heavily utilised resource that is likely to see further unsustainable demands.

Also if Afghanistan's exclusion from regional water structures is predicated primarily on its modest historic and future water demand then it begs the question why is the Kyrgyz Republic a member of the Amu Darya BVO and IFAS. It only contributes 3% of the river's flow and withdraws only 0.15 km³ (Micklin, 2000, pp. 7 & 44). Afghanistan's present role is already higher than this and some IFAS officials and analysts believe that Afghanistan's future water demands are a challenge and will have a "substantial impact" on Turkmenistan and Uzbekistan (Aslov, 2003a; Zonn, 2002; Weinthal, 2006, p 19). This would suggest the need for Afghanistan's (as well as the Kyrgyz Republic's) membership in IFAS and the BVO.

Afghanistan's absence from the regional fora cannot therefore be solely or primarily based on its "modest" and "unchallenging" water needs. Other reasons, which emphasise the role of agency and politics seem to explain its omission.

4.2 Regional Relations

A key factor has been Afghanistan's domestic situation and the implications for its relations with its neighbours. As Gleick notes the political context is important for trans-state water management (1995, p 85). For most of the last thirty years Afghanistan has been weak, unstable and its government

either unable or uninterested in cooperating with its neighbours. During this period, relations with Moscow and the Central Asian capitals have fluctuated between clientism and antagonism. In the crucial years for the ASB water management structures, 1992, Kabul had four different presidents and in 1997 when ICAS merged with IFAS, the Taliban was in power. Central Asian governments held little respect for the numerous and weak Kabul governments between 1991-96 and antipathy towards the Taliban thereafter. None formally recognised the Taliban and some actively sought to remove it (ICG 2001). This probably meant that the Central Asian government felt little need to consult with Kabul over water for over a decade. It is harder to use this line of analysis to explain why post-2001 cooperation has been poor however. After the fall of the Taliban government, Afghanistan's neighbours were signatories to a number of agreements with it. These include the Good Neighbourly Relations Declaration (2002) and the Berlin Agreements (2003). However rhetoric has not been matched by substance (Bosin, Gleason & Hanks) Afghanistan's place in the Amu Darya is still denied. In one instance this may have taken a retrospective dimension. At a NATO workshop held in 2004, specific references to Afghanistan were reportedly removed from the final report, despite having been in the initial draft (Murray & Tarlock, 2005, p 762).

4.3 Regional attitudes towards Cooperation

One reason for this lack of progress may be a pervasive "non-cooperative tendency" in the region (Wegerich 2004, p 339). "Not all stakeholders in the Central Asian region share the same values, ... or interests in promoting regional cooperation" (Bosin, Gleason & Hanks, undated, p. 1). Antipathy toward multilateral organisations and cooperation is particularly acute in Ashgabat and Tashkent. IFAS member states have expended little political or financial effort on the body (Horsman, 2001, pp. 73-4). Instead they have pursued unilateral approaches to water resources issues. Their laws have defined water as a national asset rather than common good, for example (Kaysmova 1999, quoted in Wegerich 2004, p 339). Turkmenistan's

Golden Century Lake and Turkmen Lake projects are striking examples of this unilateral approach (Horsman, 2001, pp. 76-7) Given that these artificial lakes will probably require additional withdrawals from the Amu Darya it may be an infringement of Articles 7 and 16 of the 1958 Treaty. Uzbekistan has complained about the impact of the lakes on the lower Amu Darya (ICG, 2002, p 30).

Afghanistan's exclusion may be indicative of the lack of commitment the other riparians have to IFAS, its goal of equitable water allocation and the concept of shared rights and responsibilities. As Wegerich notes "sharing a resource implies sharing costs of operation and maintenance of the resource management structures." (2004, p 336). It is therefore curious that IFAS member states seem uninterested in sharing their burden with a potential "free riding" riparian. "Regional cooperation is likely only when states value the opportunities that openness can create more than the need for control" (Rubin and Armstrong, 2003, p 39). At present the Central Asian governments seem to firmly favour the latter.

4.4 Institutional Inertia and Self-Interest

IFAS may be "dysfunctional", lethargic, biased and self-interested (McMurray & Tarlock, 2005, p 761). As such it and its key members may not want a new, potentially challenging member. Regional institutions have an inbuilt resistance to change. Decisions in ICWC, the IFAS sub-body, must be made unanimously and all members have a veto. As a result "agreement is dependent on the 'political will' of [both] upstream and downstream users." (Wegerich 2004, 338). In addition it is argued that IFAS and the Amu Darya BVO favour Uzbekistan's interests (Wegerich, 2005, 2008). Afghanistan's membership could upset the status quo and especially the downstream states' interests. It may therefore struggle to gain membership as it potentially challenges the interests of the two IFAS members with the most at stake, Turkmenistan and Uzbekistan.

Inclusion of Afghanistan in IFAS may raise uncomfortable questions about the organisation's

and its present member states' working practices and commitment to cooperative goals and adherence to allocation quotas. International donor community assistance to Afghanistan may result in its water management laws and practices based on global norms on sustainable development and genuine cooperation (McMurray and Tarlock, 2005, pp. 715-6). These are not features some of the other riparians entirely respect. Ashgabat and Tashkent may also be wary of engaging with a non-post Soviet state, closely linked to the international development and donor community. In addition the inclusion of another state with legitimate rights to Amu Darya waters could also mean that the current, albeit ineffectual and unequal, allocation system needs revising. On this specific point Afghanistan's present inability to provide reliable water data may be an advantage to some of the other riparian's. That said the Kyrgyz Republic has had similar links to the donor community. Its membership of IFAS has not led increased transparency or inclusivity in the organisation.

4.5 Upstream-Downstream Differences

The upstream-downstream dynamic is perhaps a key factor in explaining Afghanistan's exclusion. It also indicates future areas of cooperation and confrontation. Upstream Afghanistan and Tajikistan sees the Amu Darya as a source of HEP as well as irrigation. Downstream Turkmenistan and Uzbekistan see the river primarily as a source of irrigation water for cotton and rice production. Afghanistan and Tajikistan both have plans to increase their HEP production. Tajikistan's plans are much more advanced and larger in scale (EIU 2008b). It plans to double present electricity production with a number of new HEP plants, Rogun being the largest (EBRD, 2008, p 5). Afghanistan hopes that the Amu Darya tributaries, Kokcha and Kunduz, may partly address its considerable energy deficiency. It has been claimed that the downstream impact of Afghanistan's smaller schemes with smaller reservoir storage capacity will be limited (Ahmad & Wasiq, 2004, p 23).

However a shared water resource used by both irrigation and HEP users has the potential for inter-

state disagreement (Wegerich 2004, pp. 340-1). Afghanistan and Tajikistan's future HEP plans may therefore lead to disputes with Turkmenistan and Uzbekistan. Tashkent has already been critical of Dushanbe's plans (EIU 2008b). Whilst Afghanistan's proposals may have a lesser impact than Tajikistan's schemes they meet opposition from Turkmenistan and Uzbekistan who are dependent on large summer water supplies. If large-scale winter HEP generation is implemented it may have detrimental impacts for the downstream water users. It can cause downstream flooding, damage downstream infrastructure (due to ice) and reduce the amount of water available in summer for irrigation (Wegerich, 2004, p 341). It could also challenge Turkmenistan and Uzbekistan energy policies including exporting thermally-generated electricity to their neighbours. Without an integrated water-energy agreement competing inter-sectoral water use is likely to remain a key source of friction (Wegerich, 2004, pp. 340-1).

In this light it is interesting to note that the only riparian that has seriously engaged with Afghanistan is Tajikistan. Both are upstream states. They contribute the majority of the river's flow, and see the water as a potential source of HEP *and* irrigation. There may be scope for the two to work together to strengthen their position vis-à-vis the downstream states. There are other interesting synergies between them too. They are the two poorest riparians in terms of GDP, and energy and food security (EIU, 2008a & 2008b). Both have emerged from civil war. Tajikistan's civil war ended in 1997. After this it was able to start planning longer-term economic development again. This has included irrigation and HEP projects (Weinthal, 2006, pp. 16-17). Ashgabat and Tashkent have opposed Dushanbe's plans to increase its water demands. Afghanistan emerged later and more fitfully from a much longer and intensive period of conflict. It will take longer for it to increase demands on the Amu Darya but may lead to similar disputes to those arising from Tajikistan's HEP activities.

4.6 Collective Management: The benefits for Afghanistan?

A final reason for Kabul's absence from IFAS may be a question about the benefits of cooperating with the other riparians for Afghanistan. Contrary to the claim that "because of the implications of future water use in Northern Afghanistan ... Afghanistan *will have* to collaborate with the other riparians" it could in fact be argued that there are few reasons why it should (Ahmad & Wasiq, 2004, p 33. Emphasis added by this author). Similar claims that "[w]ithout the knowledge and experience of former Soviet republics on irrigated farming production ... Afghanistan can never achieve effective reconstruction" and that Soviet "irrigation technologies" should be transferred to Afghanistan to construct permanent food production for starved Afghan people" seem naïve at best (Fuchinoue, Tsukatani & Toderich, 2002, p 2, & 23). Soviet practices have led to a cotton sector, which in the view of one source, has contributed "to political repression, economic stagnation, widespread poverty and environmental degradation." (International Crisis Group, 2005, p 1) The ICG report provides striking evidence of the inherent unsustainability of Central Asian present system and why it is not a model to emulate. Kabul may be wary of cooperating with its Central Asian neighbours given they have little to offer in terms of best practice.

In addition the other riparians have already divided the river amongst themselves and established a mechanism, IFAS, without consulting Afghanistan. IFAS does not protect or promote Afghanistan's interests and rights. In fact it barely acknowledges them. Membership of this "dysfunctional" organisation would not give Afghanistan any benefits. Nor is IFAS able to coerce Kabul to join. Given the lack of commitment to regional cooperation there is little reason to see why Afghanistan should feel compelled to accept norms that others flout. Ultimately Afghanistan is an upstream state with direct and uninterrupted access to the waters it depends upon. It does not need to ask any other state for permission to utilise this resource.

It seems however that Kabul values cooperative water management structures. It sees it as a means of defending and promoting its own national interests and protecting a shared natural resource. Afghanistan's Foreign Minister, Abdullah Abdullah, first stated the importance of regional cooperation in the country's foreign policy in 2003 (Rubin & Armstrong, 2003, p 35). Kabul's support for transboundary water cooperation, was emphasised in the 2007 Ministry of Energy and Water's draft Transboundary Water Policy document and the 2008 Water Security Strategy draft. The 2007 draft argued that fellow riparians had taken advantage of Afghanistan's 30 years of weakness and instability and failed to consult or compensate it for their increased extractions from shared rivers during the last "three decades of occupation, civil unrest and post conflict reconstruction." During the same period, the draft continued, Kabul was unable to "implement projects ... or defend its interests ... in the ongoing process of water resources sharing" (The Government of the Islamic Republic of Afghanistan, 2007, pp. 6-7). The draft argued that being party to international agreements would:

- Encourage regional cooperation and understanding.
- Protect Afghanistan's water rights, encourage economic development and international donor investment lead to "fair and sustainable" water allocation. And
- Prevent possible water conflicts.

(Government of the Islamic Republic of Afghanistan, 2007, pp. 2-3)

5 Conclusion

Fellow riparians recognition of Afghanistan has been poor. It probably reached its peak in 1987. Since then the Central Asian states have gained independence, indigenous regional water management structures established and diplomatic relations with Afghanistan improved. Genuine inclusive cooperative institutions have not been created and Afghanistan's interests not recognised however.

Afghanistan seems to have been ignored because of regional political trends and norms, an antipathy towards multilateral cooperation and institutions, and the inbuilt self-interest and unequal power relations within IFAS and Central Asia more generally.

There are also more benign reasons for Afghanistan's exclusion. Cooperation with Kabul is not a priority for any of the other riparians. At present, there is no water crisis that needs to be resolved through negotiations and cooperation. (In fact until there is a crisis cooperation may not take happen. Fortunately evidence suggests that most transboundary water disputes end in agreement not conflict (ICG, 2005, p 30, Naff and Matson, 1984; Economist, 2008). Afghanistan's probably modest but uncertain future water needs may also have a limited impact on its fellow riparians and the Aral Sea's interests, at least in the near future. As a result both the World Bank and USAID favour prioritising the rehabilitation of Afghanistan's domestic water management and technical capacity over immediate integration into regional fora (Ahmad & Wasiq, 2004, p 41, Weinthal, 2006, pp. 19 & 27). Once Afghanistan has re-established its water analysis and management structures it will be better placed to engage with its fellow riparians (Rycroft & Wegerich, 2008).

Most authors agree that Afghanistan's inclusion in regional water structures should begin at the technical level. This would improve Afghanistan's hydrological data and help inter-state information-sharing. It would help provided a credible and complete picture of water resources and demands and help inform regional decision-making. It would also encourage apolitical experts-to-experts contact with confidence-building implications.

IFAS and its present member states should be encouraged to revise their attitudes towards Afghanistan's interests and its potential membership. They should also honour existing agreements and

declarations. They should be planning for and assisting Afghanistan's future entry into IFAS. At present allocation "is based on a first come first serve basis within the set [ICWC allocation] limits." Tajikistan showed in the droughts of 2001-2 that upstream states are able to take their full allocation leaving little for the other riparians (Wegerich, 2005, p 12). At present, Afghanistan, unencumbered by the superficial constraints of IFAS membership could easily follow Tajikistan example. It seems therefore in Uzbekistan and Turkmenistan's long-term interests to bring Afghanistan into a competent and enforceable water management structure not the present "dysfunctional" one. "Successful integration of Afghanistan is ... crucial for achieving sustainable solutions to water management challenges in the region." (Kranz, Vorwerk and Interwies, 2005, p 11). It would help address water-energy swaps, sustainable economic and environmental developments including conserving the Aral Sea, adherence to international water laws and encourage broader and meaningful inter-state dialogue and cooperation.

The likelihood of this happening in the near future and without a crisis as a catalyst is uncertain however. Afghanistan remains weak and focused on its own internal issues, the Central Asian government uninterested in meaningful economic or political reform including inter-state cooperation, and the international donor community focussed, with some justification, on other priorities in the region.

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Endnote

1. This figure only includes Afghanistan rivers that permanently flow into Amu Darya. It does not include Afghanistan or Iran's terminal rivers.
2. For information about Executive Committee of IFAS, see EC-IFAS, 2008.

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ILLUSTRATING CO-EXISTING CONFLICT AND COOPERATION IN THE ARAL SEA BASIN WITH TWINS APPROACH

Suvi Sojamo

Department of Biological and Environmental Sciences, University of Helsinki, Finland

The Aral Sea Basin has seen several efforts to develop transboundary water resources management. However, despite cooperative actions disputes have characterized the hydropolitics in the region. Many studies on the basin relations have focused on conflict intensity on one dimensional axis and neglected the importance of power asymmetries and interaction in a wider political context. This paper intends to illustrate hydro-hegemonies (Zeitoun & Warner, 2006) and co-existing conflict and cooperation in the Aral Sea Basin with Transboundary Freshwater Interaction NexuS (TWINS) (Mirumachi, 2007). The aim is thus to draw trajectories for the basin relations and to identify drivers for conflict and cooperation for future scenarios.

1 Introduction

Water issues have been high on the political agenda of the states in Central Asia since their independence in 1991. Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan inherited a challenging legacy of regionally integrated but imbalanced water governance, deteriorated water management infrastructure harnessed for cotton monoproduction and an environmental and socio-economic disaster of the Aral Sea from the Soviet Union. In order to avoid dislocations in the

turbulence of independence, the states signed the Almaty Agreement in February 1992 where they established the Soviet Era energy-water allocations, promising to refrain from unilateral actions and to promote exchange of information. The states also saw a need to continue regional administration, and thus preserved the Soviet-time Basin Valley Organizations (BVOs) for Syr Darya and Amu Darya and created an Interstate Commission for Water Coordination (ICWC). These initial decisions to retain the Soviet management status-quo have been followed by a number of proclamations by the states about the water reform. However, reformative changes to combat the water crisis have not been able to overcome the dysfunctions in the established system. Since the downstream states have struggled in the economic transition from over-reliance on water-consuming cotton to more

Corresponding author:

Suvi Sojamo

Environmental Science and Policy

Department of Biological and Environmental Sciences

P.O. Box 56 Viikinkaari 9

FI-00014 University of Helsinki, FINLAND

E-mail: suvi.sojamo@gmail.com

sustainable forms of production and the upstream states are dependent on their hydropower potential, water continues to be a scarce commodity. Despite hundreds of agreements and willingness to solve the evident basin-wide problems, the state of the environment and welfare of the societies in the Aral Sea Basin remains still critical today (Glanz, 2005; Weinthal, 2006).

In order to understand the hydropolitics and the state of transboundary water management in the Aral Sea Basin, one must take in account that they are rooted in geopolitical power play. Imbalanced power relations between the states have been claimed to be the reason for the establishment of the downstream favouring Soviet status-quo at the time of independence and power-asymmetries are clearly complicating the basin water management today (Allouche, 2007). Central Asia has been among the most peaceful regions in the former Soviet Union as Tajikistan alone has experienced large-scale civil conflict in 1992, but the basin has also been seen as prone to conflicts about water as hydro- and energy-imperatives of upstream and downstream states have started to collide (see e.g. ICG, 2002; Allouche, 2007; Wegerich, 2008).

The Soviet policy in Central Asia has been claimed to have been based on “divide and rule” (Kubicek, 1997; O’Hara, 2000), but on the other hand, by making the states strongly dependent on each other, Moscow’s motives might have been more on “integration and ruling” (Wegerich, 2008). Initially, the five states were forced to cooperate, but instead of forming a strong regional union, they have suffered from their dependence on each other while rebuilding their national identities and economies. The disruption of Soviet-time economic ties has revealed the advantages and disadvantages of the five countries in terms of natural resources and geographic location. According to agreements, the upstream states are allowed to use their hydropower facilities to produce electricity in summer when the downstream states also need water for irrigation, but in recent years upstream Kyrgyzstan and Tajikistan have run the plants also in harsh winters which has caused downstream flooding in that season and water shortages in summer, leading

to bilateral disputes. New conflicts have also been rising regarding operation and maintenance costs of the water infrastructures, which are currently on the responsibility of the upstream states (Glanz, 2005). Control and enforcement mechanisms no longer function and the states now often accuse each other of exceeding agreed quotas and failing in barter agreements (Wegerich, 2008).

In the past ten years, individual needs and national interests have continued to alienate these countries, prompting them to look for new trade partners instead of regional integration. Hence, it is not any more only Moscow, but also Washington, Beijing, Ankara and Tehran who mix the geopolitics in the region. Efforts to rebuild Afghanistan put yet more strain on water supplies in the upsprings of the rivers running to the Aral Sea. On the other hand, third parties and donors including the World Bank, the Global Environmental Facility (GEF), USAID, UNEP, UNESCO and European Union have invested in development projects in the basin ranging from environmental restoration to public awareness raising. Unfortunately, lack of regional coordination has often diminished their effectiveness. There has been an oversupply of poorly coordinated actions, for which not only the states and basin organisations, but also donors can be blamed. This has made the states suspicious of external intrusion as they have a long history of foreign rulers mismanaging their water resources (see e.g. O’Hara, 2000).

Despite several efforts to develop transboundary water management in the region, it is truly questionable whether the current water governance of the Aral Sea Basin is sustainable. Recently, *Integrated Water Resources Management (IWRM)* (GWP, 2003) has been widely applied in Central Asia, but as a method, it has been claimed to lack a necessary understanding of differences in political economies and asymmetric power behind allocations (Allan, 2003). Even seemingly non-politicized local development projects can be jeopardized, not to speak of basin wide actions, if water in the wider context of political interaction is ignored. Hence, holistic approaches to picture politics of water and water management are

needed. This paper utilizes one such approach, *Transboundary Waters Interaction Nexus* (TWINS) (Mirumachi, 2007), which is based on the framework of *hydro-hegemony* (Zeitoun & Warner, 2006). Mirumachi & Allan (2007) have proposed TWINS as a way to analyse and observe how the dynamics of power play out in water governance. They argue that for successful water allocation and management, there must be consideration about how the intensities of conflict and cooperation in transboundary relations and development of the political economy change over time (Mirumachi & Allan, 2007). Zeitoun and Mirumachi (2008) emphasize that not all cooperation is good nor all the conflicts are bad for successful water management. Progress in transboundary water management is a result of interaction for which drivers have to be identified.

Based on the analysis of given speech acts and water events in Central Asia in the context of water governance, the aim of this paper is to illustrate the co-existing conflict and cooperation, hydro-hegemonies and the development of political interaction in the Aral Sea Basin with TWINS approach.

2 Framework of hydro-hegemony and TWINS approach

The post-Cold War discourse on hydropolitics has been actively debated (for a survey, see e.g. Zeitoun & Mirumachi, 2008). It has evolved from popular 1990's dystopia of water wars via statements of their irrationality and lack of historical evidence (Wolf *et al.* 2003) and theory of environmental conflict prevention and solving (see e.g. Beach *et al.* 2000) to current understanding of *co-existing*, enduring conflict and cooperation in a power-determined context (see e.g. Zeitoun & Warner, 2006; Zeitoun & Mirumachi, 2008). Transboundary water institutions as being among the first international embodiments of *global governance* have influenced the building of regime theory in international environmental politics (Finger *et al.* 2006), but thus, when applied to hydropolitical analysis, the theory cannot really see the asymmetric power in its own background.

Many studies of the hydropolitics of the Aral Sea Basin thus far, including UNESCO's from *Potential Conflict to Cooperation Potential* (PC-CP) program (UNESCO, 2003) and Wolf & Newton's (2008) study and conflict intensity scaling of the basin events have seen conflict and cooperation only as an opposite ends of a single axis. Treaties and institutions have been seen as indicators of collaboration. In result, in these analyses the Aral Sea Basin has been seen as rather cooperative, whereas e.g. Sievers (2001), ICG (2002), Weinthal (2006) and Allouche (2007), concentrating more on a wider context of political interaction, have also warned of potential conflicts on water in the region.

Conflict and cooperation in transboundary water management are not on a continuum progressing from irrational individualistic conflict to rational collective cooperation (Zeitoun & Mirumachi, 2008). Acceded conventions or agreements are not necessarily accurate indicators of cooperation, which is highly evident also in the Aral Sea Basin. According to Zeitoun & Warner (2006) and Mirumachi & Allan (2007), truly effective cooperation in transboundary water management is often hindered because of imbalanced power and economic relations. Absence of conflict does not necessarily mean there to be truly fruitful collaboration as *hydro-hegemonies* can dominate the seemingly non-politicized or cooperative politics. This can be done by using water resource control strategies such as '*resource capture*' (e.g. land acquisition, land annexation or the construction of large-scale hydraulic works), '*containment*' (the stronger state may seek to influence the weaker riparian towards compliance through e.g. treaties in its favour) and/or '*integration*' (by "building-in" to a regime benefits that may be more equitably distributed than the water itself, a hydro-hegemon may concede some of the privileges offered through its relative power). The strategies are executed through '*coercive*', '*ideational*' or '*bargaining*' power tactics that are enabled by the exploitation of existing power asymmetries within a weak international institutional context (Zeitoun & Warner, 2006: 444-446.)

In the case of the Aral Sea Basin it has been now widely recognized both in and outside of the region that IFAS (International Fund for the Aral Sea) and ICWC have failed to sustain dialogues they have started (ICG, 2002) – power in the decision making level is imbalanced and water management is separated from environmental management in the administrative level leaving space to individualistic and short-sighted policies and hegemonic actions. In some cases, states may not have to go through interactions over water allocation and management, as they can solve their water resource needs by trading in water intensive commodities or manufacturing water (Mirumachi & Allan, 2007), but the states in Central Asia are clearly not capable of that yet.

The typologies and driving forces behind hydropolitics can be illustrated by placing the water events of the basin on the three-dimensional TWINS field that is constructed of the axis for *cooperation intensity*, *conflict intensity* and *robustness of political economy* (Fig. 1.). The diagram provides analytical space to trace the trajectory of interacting riparian relations through time. As *securitization* of water

issues, making them a part of national security, and sanctioned discourse of states make politics of water more complex than they first seem, the trajectories for transboundary relations can show how power manifests in water allocation, development and management (Mirumachi & Allan, 2007.)

For classification of conflict intensity in transboundary water relations, TWINS utilizes Warner’s (2004) and Zeitoun’s (2007) works, which are based on that of Copenhagen School (e.g. Buzan *et al.* 1998) regarding security: As issues become more of a threat to the state, they are prioritized in the national agenda, thereby receiving more attention and attracting allocations of various state resources. Issues that do not concern the state, or issues that are not in the public domain, are ‘*non-politicized*’ issues. Once the issue gains a place on the political agenda it becomes ‘*politicized*’, “part of public policy, requiring government decision and resource allocation” (Buzan *et al.* 1998:23). ‘*Opportunized*’ issues may justify actions outside the bounds of normal political procedure. The issues in this level can also be ‘*securitized*’

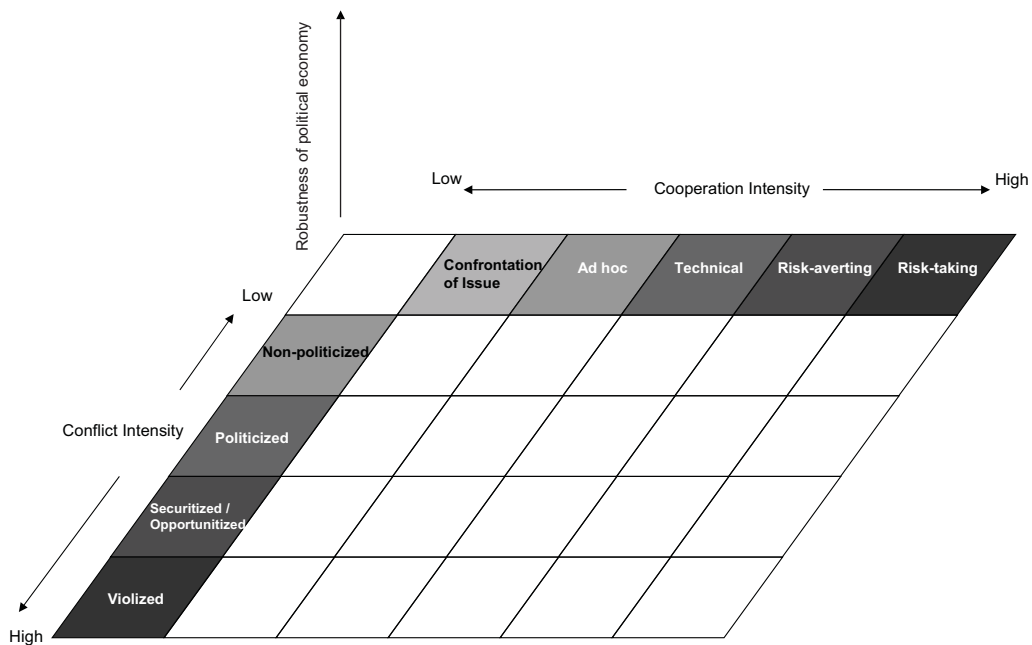


Figure 1. TWINS field (Mirumachi, 2007)

when they call for emergency measures and at the extreme, they can escalate to ‘violized’ issues. Thus, there are four levels of conflict intensity in TWINS (Mirumachi, 2007).

Conceptualization of hydro-political interaction has thus far focused only on measuring conflict intensities and thus lacked a truly holistic approach. That for based on the work of Tuomela (2000) Mirumachi (2007) has identified five levels of cooperation intensity to enable the construction of TWINS. At the lowest level of cooperation intensity, there is ‘*confrontation of the issue*’. In such interaction, the issue is acknowledged but there is no specific joint action or identification and sharing of goals. When there is joint action but no shared goals, it can be considered as to be ‘*ad hoc interaction*’. When there are shared goals but no joint action is taken, the interaction is considered to be technical cooperation. The difference between these two intensities of cooperation is how actors shape their goals. In ‘*ad hoc interaction*’, the actors are acting in a similar way but with different goals. When interaction becomes ‘*technical*’, there may be shared goals in how to solve a specific water-related problem, but actions and policies may not necessarily be aligned. Once there is joint action and shared goals, in addition to the belief that the other will behave as expected in the execution of the action, interactions can be considered as high in cooperation intensity. This level is ‘*risk-averting*’ because the states do not undertake the unforeseen costs in the future when committing to such action. Finally ‘*risk-taking cooperation*’ is an ideal form of cooperation as it is unlikely that states will assume costs without evident reciprocation (Mirumachi, 2007.)

It is important to emphasize that it is not possible to create a database and investigate “the truth” of different basin relations, or to predict the future through TWINS – the approach is more likely a hermeneutic tool for analysing the hegemonies behind the politics. In the case of Central Asia, there are several hegemonic and sanctioned discourses about the power in hydro-politics in and outside the basin. In comparison to the analysis presented in this paper, water management officials in the given countries or international organisations could see

the nature of the states’ actions differently and draw different trajectories of the development of the relations on the TWINS field. However, analysing the stakeholders and the drivers for interaction is the first step for a reform.

3 Illustrating co-existing conflict and cooperation in the Aral Sea Basin

3.1 Hydro-hegemony in the Aral Sea Basin

Most of the TWINS studies thus far have been of basins which have a clear hydro-hegemon (see e.g. Zeitoun & Mirumachi, 2008), but in the case of Central Asia, instead of replacing the role of Moscow with one hydro-hegemon, all the states of the Aral Sea Basin have represented some sort of hegemony. According to Wegerich (2008), none of the states has managed to take dominative role in water management as they all are “actively and passively engaged in competition over the use of the flows” (Wegerich, 2008: 78). On the other hand, Russian dominance continues to be strong in the region. Still there are evident regional imbalances in the power relations which complicate the transboundary management.

Due to its geographical location in both of the basins of Amu Darya and Syr Darya and its intensive interaction with all of its neighbours, Uzbekistan, in relation to other states, has been chosen to be the basis for this analysis. As the strongest military power, with the biggest population, intensive cotton production, and having control over the regional electricity lines Uzbekistan can be claimed to be a regional hegemon, possibly also a hydro-hegemon. Uzbekistan’s over-reliance on cotton makes it extremely vulnerable to water mismanagement at any point on either the Amu Darya or the Syr Darya. Its main goal is to maintain the position that it established during the Soviet era, i.e. enjoying increasing allocations. Uzbekistan has achieved food security, but it would like to expand the production for export countries. One possibility that Uzbekistan is again exploring with Kazakhstan and Russia is the Soviet Era proposal of diversion of the Siberian Ob and Irtysh rivers to the Central Asian countries. However, the project would have

disastrous environmental consequences in an already vulnerable area (ICG, 2002; Allouche, 2007: 51.). Such a plan is probably only for supporting hegemony in the basin and not likely to materialize.

On the other hand, Uzbekistan is the only Central Asian country, which has acceded to the *United Nations Convention on the Non-Navigational Uses of International Watercourses* (UN ILC, 1997). Thus it is legally obliged to implement the principles of "reasonable and equitable use" of water and ecosystem preservation and protection. As it has used in its former resource capture and containment strategies both bargaining and coercive tactics to guarantee its needs, it can be asked whether its accession is a sign of sincere commitment or again a new, ideational tactic to boost its power in hydro-politics. Uzbekistan has been actively seized on internationally funded regional environmental projects and it has also benefited most from them. While advertised as an IFAS project, AralGEF, one of the biggest environmental restoration projects in the basin, has been stated to have been almost entirely an Uzbekistan project (Sievers, 2001). Uzbekistan is playing on multiple chessboards, catering to different audiences, both international and domestic. The Uzbek government has securitized water issues as a national security interest and also as an environmental issue.

However, Uzbekistan does not represent all the characteristics for a hydro-hegemon, nor it does it alone. According to Wegerich (2008), considering its control over infrastructure in the lower and middle Amu Darya, Turkmenistan may be regarded of as a hydro-hegemon relative to Uzbekistan, while Tajikistan might also be considered to establish some form of hydro-hegemony with its plan to construct the Rogun Dam. The same could be claimed for Kyrgyzstan as it has the access to the upstream of the Syr Darya in relation to Uzbekistan and Kazakhstan. According to Shalpykova (2002) and Allouche (2007) the upstream states have little bargaining power in the region. Still, Wegerich (2008) emphasizes, as upstream states, they enjoy the strategic leverage. Hegemonic actions

of the downstream states have aroused counter-hegemonic actions from the upstream states which has made the politics on water dynamic.

The purpose of the following trajectories is to show the general trend in water politics rather than the detailed analysis of each and every speech act and event in the basin. The dimension of the robustness of political economy is left out of the diagrams because the two-dimensional trajectories can in this case more distinctly show prevailing tendencies. That does not diminish its importance though. Besides the bilateral trajectories, drivers for conflict and cooperation are drawn for the whole Aral Sea Basin.

3.2 TWINS trajectories for the basin relations

3.2.1 Uzbekistan and Kyrgyzstan (Fig.2.)

The initial stage of Kyrgyzstan's and Uzbekistan's relationships was characterized by the illusion that the previous allocation schemes could be feasible in the new political and economic realities of the post-Soviet period (Fig.2;1). The next stage of state interaction on the water issue could be dated back to the period of 1993-1996, when the relations started to show obvious signs of strain (Fig2;2). Between 1993-1996 upstream Kyrgyzstan utilized several times its hydraulic potential to hydropower generation in the winter seasons. In reply to such actions, the Uzbek side threatened to halt gas deliveries to Kyrgyzstan, and thus forced Kyrgyzstan to meet its commitments under the 1992 Almaty Agreement. This period is noteworthy due to the fact that for the first time in the history of riparian relations, one basin state used resource capture strategy to compel another one to follow certain obligations (Shalpykova, 2002).

However, in 1997, due to a shortage of gas deliveries from Uzbekistan and irregular coal and oil supplies from Kazakhstan, Kyrgyzstan made a decision to revise its relationship with the countries downstream it. Using bargaining tactic, the upstream state adopted a resolution, which stipulated that money should be paid for water

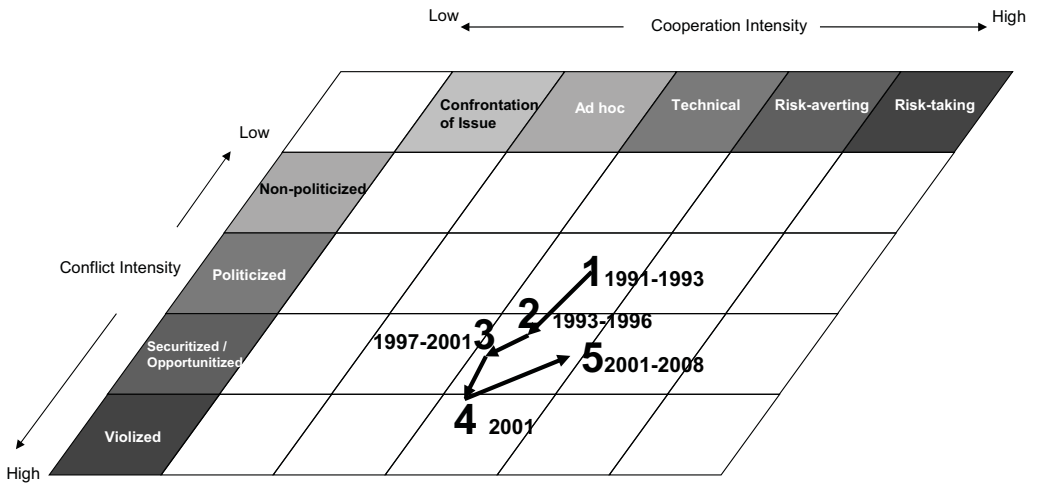


Figure 2. Trajectory of Uzbekistan-Kyrgyzstan relations

releases downstream. Furthermore, upstream Kyrgyzstan adopted Uzbekistan’s methods and began to use its abundant water resources as a tool to force its two downstream neighbours to supply energy resources in time and at acceptable prices. Over 1997-2000 the relationships between the states continued to exhibit a tendency towards deterioration and utterly reached their critical point in the summer of 2001 (Fig.2;3). During this period the co-riparians began to clash more furiously, exchanging mutual accusations, criticizing each other and ignoring the water-related negotiations.

Currently, the major point of contention between Kyrgyzstan and Uzbekistan is the Soviet Union-constructed massive hydroelectric facility and reservoir, Toktogul, on the Naryn-Syr Darya cascade in Kyrgyzstan. In recent years, Uzbekistan has continuously accused Kyrgyzstan of acting against signed agreements on allocations and management of the upstream facilities and international customary law (Fig.2;4). According to Sievers (2001:388) ”increased short-term tension may be the price of convincing the states to resolve issues that otherwise would explode into open and unmanageable conflict in the longer term”, but Kyrgyzstan is now searching for ways to break free from its dependence to its downstream neighbour by teaming up with other states.

In the case of Kyrgyzstan, hegemony has called forth counter-hegemonic resistance. The most relevant aspect of hydro-hegemony in the case of Kyrgyzstan and Uzbekistan is not any more about water allocation, about the right to water, but about the water use (Wegerich, 2008).

3.2.2. Uzbekistan and Kazakhstan (Fig.3.)

As the most downstream country in the Syr Darya basin, Kazakhstan too has had tense hydropolitical relations with Uzbekistan (Fig.3;1). Kazakhstan has accused Uzbekistan of arbitrarily controlling the river’s flow, with the effect of periodically ruining agriculture in southern Kazakhstan. Border issues and water rights are another area of concern in the bilateral relations of the countries (Allouche, 2007). The ecological state of the Aral Sea has been especially on Kazakhstan’s agenda in regional meetings.

Otherwise the two most powerful economies of the region have formed trade agreements and are reviving common projects to transport water from Siberia to guarantee their increasing needs (see e.g. Allouche, 2007). Kazakhstan is the only country in Central Asia, which has been able to embrace more diverse market economy and it enjoys remarkable oil revenues. For Kazakhstan, the water issues in the Aral Sea Basin have thus lost their priority on

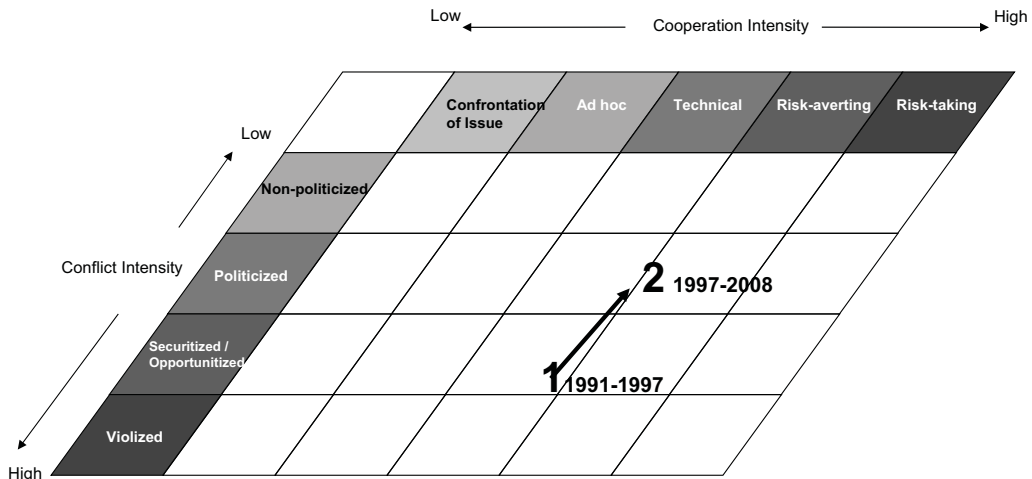


Figure 3. Trajectory of Uzbekistan-Kazakhstan relations

the political agenda in comparison to upstream states (Fig.3;2) but they still continue to be an area of especially environmental concern.

3.2.3 Uzbekistan and Turkmenistan (Fig.4)

The greatest tensions in the Aral Sea Basin, thus far, have been between Turkmenistan and Uzbekistan with regard to Amu Darya. At the independence, rumours circulated of a small-scale armed conflict of the river's resources between the two states (Allouche, 2007) (Fig.4;1). According to Sievers (2001), there have been reports of Uzbekistan troops taking control of water control installations on the Turkmenistan bank of the river by force, and in 2001, there were reports of a massacre of a large number of Uzbekistan troops in Turkmenistan (Fig.4;2). While these reports are largely unsubstantiated, there is no doubt that the tensions are escalating (Sievers, 2001.)

Turkmenistan announced resource capture strategic plans in 1999 to construct a large artificial lake in the Kara-Kum desert through construction of a massive new diversion of the flow of Amu Darya. In the summer of 2000 and continuing into 2001, levels in the lower reaches of Amu Darya had dropped noticeably. In 2001, increasing numbers of people in both Karakalpakstan and Khorezm lacked both irrigation water and drinking water and large numbers of the residents of the regions

were attempting to flee to neighbouring regions of Turkmenistan and Kazakhstan (Fig.4;2) (Sievers, 2001). According to the International Crisis Group, "there is also an ethnic dimension to the [lake] project—an estimated one million ethnic Uzbeks living in the Dashkhowuz province of Turkmenistan are to be resettled to the Kara-Kum desert once the lake has been completed" (ICG, 2002; 26). In addition to concerns about population movements, the lake project has raised concerns in Uzbekistan that water will be drained from Amu Darya to maintain the lake's water level. Other tensions between the two states have arisen over shared irrigation systems around the Tuyamuyun reservoir. The reservoir belongs to Uzbekistan, but is located in Turkmenistan. The situation in 2007 seemed more stable but joint management of the reservoir was still not assured. (Allouche, 2007: 50).

In recent years, Turkmenistan has not participated in the regional meetings concerning water management as it sees it as a "domestic issue". However, there is no doubt that water issues are still highly prioritized in its political agenda. The government of Turkmenistan, being highly authoritarian and controlling its economy strictly, has been claimed to have used the most coercive and (counter-)hegemonic tactic against Uzbekistan and to have started to follow unilateral resource capture policy. On the other hand, sanctioning this sort of

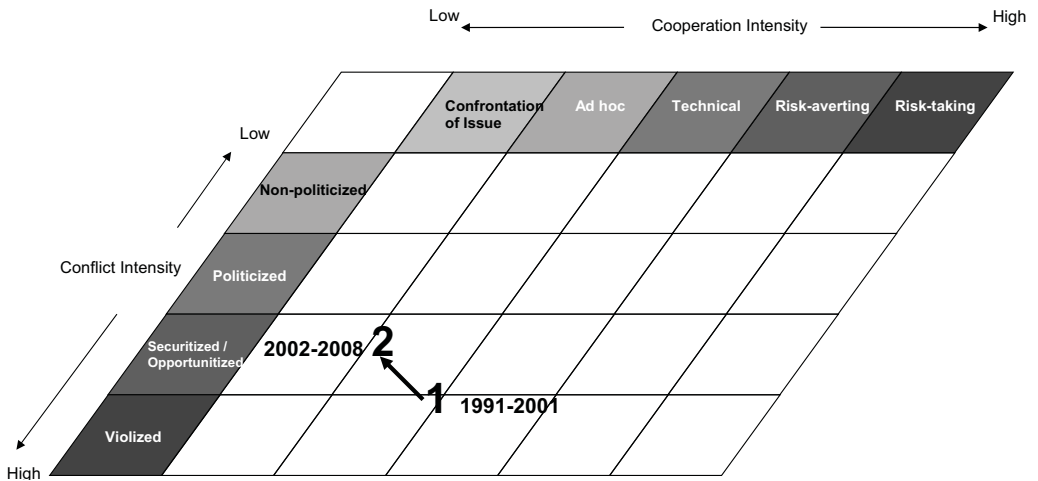


Figure 4. Trajectory of Uzbekistan-Turkmenistan relations

discourse could be a strategy from Uzbekistan’s part to show that Uzbekistan is non-hegemonic and a victim in the situation. According to Wegerich (2008), it harms Turkmenistan not to engage in the discourse or to facilitate a counter discourse by opening up its data of the use of the watercourse, since the BVO for Amu Darya, Basin Valley Organisation for calculating the water use, seems to be Uzbek dominated.

3.2.4. Uzbekistan and Tajikistan (Fig.5.)

Since their independence, Uzbekistan has actively poured cold water on Tajikistan’s plans to increase its share of Amu Darya. Due to Dushanbe’s unpaid debts, Tashkent has cut off the electricity and gas deliveries to its neighbour during winters, which has forced Tajikistan to run the power plants against allocations causing bilateral disputes. However, the dynamic relations could shift significantly if Tajikistan manages to implement its economic development vision (Allouche, 2007).

Even during the years of internal instability, water issues were relatively highly prioritized in Tajikistan’s political agenda as it took part in most of the regional negotiations (Fig.5;1.). Since 1998, Tajikistan has been planning to restart the construction of the Rogun reservoir and Sangtuda dam in the Amu Darya’s tributary Vakhsh Basin, both of Soviet period projects being frozen temporarily by the Tajik civil war. Due to Uzbekistan’s

opposition against projects which would give Tajikistan control over the river, Tajikistan has struggled to find international financing for its plans even though Russia and Iran have been possible candidates for investing. According to Wegerich (2008), the construction of the Rogun Dam might put Tajikistan into a similar position as Kyrgyzstan, which is demanding from the downstream riparian states Kazakhstan and Uzbekistan cost-sharing for its reservoirs. Even if Tajikistan succeeded in receiving financing for its projects e.g. from Russia or Iran, it would still have to find a way to bypass the currently Uzbek controlled regional energy grid line in order to be able to have full control of its own production and trade of electricity. Therefore Tajikistan is teaming-up with Kyrgyzstan to build a north-south transmission line which would make it “independent from the energy-grid hegemony of Uzbekistan” (Wegerich, 2008; 83). (Fig.5;2)

In order to gain support for its projects, Tajikistan has taken ideational counter-hegemonic actions in recent years to change the prevailing Uzbek-dominated discourse (Fig.5.;3). In 2007 Tajikistan made a diplomatic push during the United Nations General Assembly to raise the profile of Central Asia’s water dilemma and agitated for greater cooperation among Central Asian states on water-related issues. It has also started to host and sponsor regional water conferences.

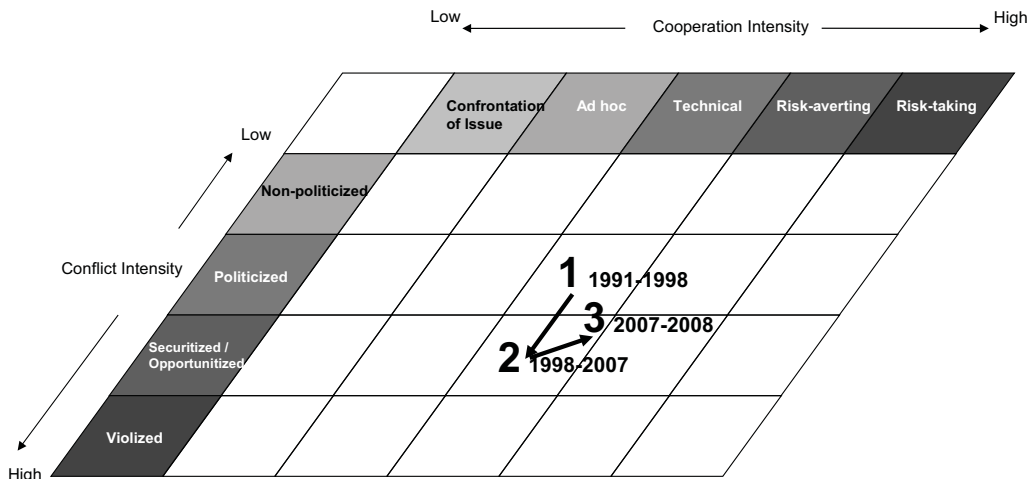


Figure 5. Trajectory of Uzbekistan-Tajikistan relations

3.2.5. Hegemony arousing counter-hegemonies

Trajectories presented here have only been drawn on Uzbek-relations on the Syr Darya and the Amu Darya – there are naturally interaction in the region on other rivers and between the other states as well. However, already these trajectories show that typically for a new transboundary basin, hydropolitical relations in Central Asia have been dynamic since the states' independence. The TWINS approach can illustrate the counter-hegemonic trend and co-existing conflict and cooperation in the basin relations - a phenomenon that e.g. Wolf's Basin at Risk project (Wolf *et al.* 2003) fails to detect by only scaling water related events on one dimensional axis. Despite its self claimed hegemony in the basin, Uzbekistan and the regional water institutions it has been dominating, have failed in promoting more sustainable water management in the Aral Sea Basin. Economic-imperatives have thus far dominated its politics and overshadowed its role as a regional forerunner and leader in water management.

Instead of building possibilities for benefit sharing *beyond the river* (see Sadoff & Gray, 2002), the states are quarrelling of allocations and taking unilateral actions. We do know the history and current reasons for this, but we also know that if

current trends prevail, the regional stability and development of the societies in the Aral Sea Basin are at risk.

3.2.6. Drivers for conflict and cooperation in the Aral Sea Basin

What is needed for a truly effective cooperation between the five states? It is clear that there are no simple answers for this question. However, it is also clear that basin is the right unit for the water management. All the states in the Aral Sea Basin have to be included in the management of transboundary water resources as they are not yet capable of independently guaranteeing their needs without causing harm to their co-riparians. TWINS field is a practical tool for listing the possible drivers for conflict and cooperation in the basin on the same picture (Fig.6.).

Currently it seems that in sum, there will be no fierce conflicts nor revolutionary wave to alter the situation for better in the basin, as the forces are rather equal in intensity. Development is stagnated. The balance is still delicate: above all, changes in the political economies of the states can shift the priority of water issues in their agenda.

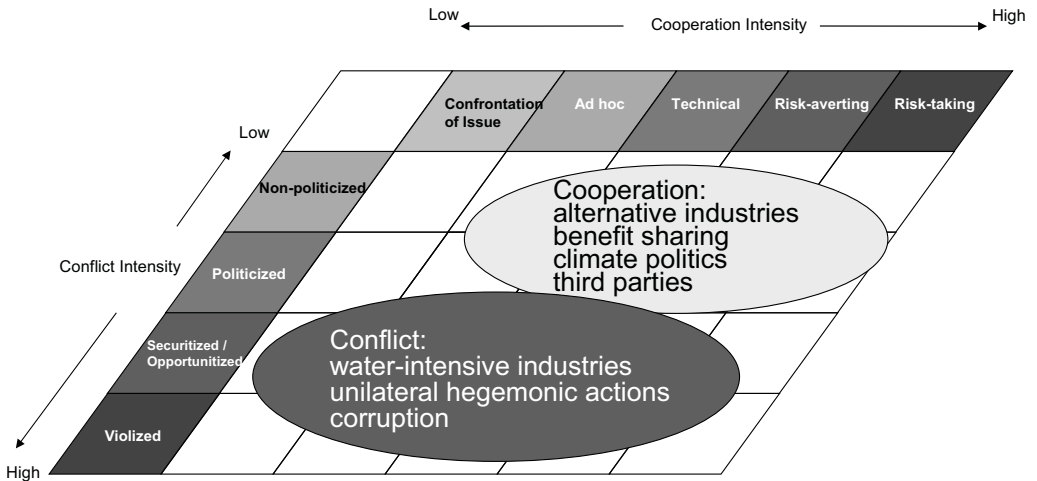


Figure 6. Drivers for conflict and cooperation in the Aral Sea Basin

The focus of global power politics is currently close to the region and geopolitics in the basin are once again crowded with external interests. On the other hand, global soft power is also growing stronger all the time of which climate politics is an excellent example.

In order to act according to the principles of IWRM (GWP, 2003), the states and the basin institutions would need a new culture of administration as corruption in the water sector is a severe problem in the region (Transparency International, 2008). Corruption may even blur the nature of interactions which further complicates policy planning. Therefore new generation of officials should be educated, regional and international treaties should be implemented in the country legislations and third parties' actions and funding should be more carefully coordinated in the basin.

Even though Aral Sea has been a victim of overuse of the flow of the two rivers running to it, crisis in the basin is not due to water stress but disagreements about quotas, deteriorating infrastructure and unsustainable use of water. If the states in Central Asia became convinced that a shift beyond allocations to benefit sharing and a shift to less water-intensive industries would be for their own good, environmentally, economically and societally, the Aral Sea Basin could have a brighter future.

4 Conclusion

Since the independence of the Central Asian states, their interaction on politics of water has been dynamic presenting simultaneously cooperative and conflictual tendencies. Even though transboundary water resources management has been built on institutions, agreements and foreign funded projects, the TWINS trajectories of Uzbekistan – co-riparian relations presented in this paper show that unilateral hegemonic and counter-hegemonic strategies dominate the hydro-politics in the Aral Sea Basin. Instead of forming a strong union the states are today yearning to break free from the regional interdependencies. However, development of the societies, state of the environment and regional stability are at risk in Central Asia as long as the states are not capable of moving from quarrelling about water allocations to sharing benefits beyond the river.

Coming years will show whether the states will be able to cooperate on developing common water policy as water issues and water-energy linkages will likely remain high on their political agendas. Efforts to reform transboundary water regime in the basin have to be carefully coordinated, acknowledging challenged power asymmetries and promoting more diverse political economies.

Only then the transboundary water management in the Aral Sea Basin can be built on more equal and sustainable basis.

Acknowledgments

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SOCIO-TECHNICAL ASPECTS OF WATER MANAGEMENT IN UZBEKISTAN: EMERGING WATER GOVERNANCE ISSUES AT THE GRASS ROOT LEVEL

Iskandar Abdullayev¹, Fatima Nurmetova², Farida Abdullaeva² & John Lamers²

¹ Center for Development Research, University of Bonn, Germany

² German- Uzbek Khorezm project, ZEF/ UNESCO Office, Urgench State University, Uzbekistan

The recent changes in agriculture have created dynamic environment where de-collectivization result formation of individual farm units. The water management system which was meant for collective farming, both hard (irrigation network) and soft (institutional) components became irrelevant for more individualized agricultural production. Recently established water users associations (WUAs) for filling gap on water management at the local level are facing many problems, such as chronic non-payment of membership fees, inability to install clear water management rules, etc. The objective of this paper is to analyze the recent changes in water management governance at the former collective farm level due to the structural changes in agriculture and present options on improving it. In the context of the IWRM discourse, the study will contribute to the development of more realistic plans in the context of transitional economies of Former Soviet Union (FSU).

1 Introduction

Integrated Water Resources Management (IWRM) is defined by Global Water Partnership as follows: coordination of development and management of water, land and other resources for maximizing of economic results and social welfare with no compromise on environment (GWP.2000). The central principals of the IWRM are participation, integration of the resources, institutions and stakeholders for sustainable water resources

management. The recent analysis of IWRM worldwide has shown that IWRM plans consist of four components: policy, water management along hydraulic boundaries, participation and management instruments (Saravanan *et al.*, 2008). There are ambiguity and critique of the IWRM principles at present on how it is understood and implemented globally (Mollinga *et al.* 2006, Saravanan *et al.* 2008). The IWRM national plans are focused to integrate water use sectors along the single coordinating basin-wide organization. However, in the water sector multiple actors at the different levels and arenas are interacting and making water management a socio-political process (Bhat and Mollinga. 2006,

Corresponding author:

Iskandar Abdullayev

P.O. Box 4545, Glavpochtamt, Tashkent,

100 000, Uzbekistan

E-mail: i.abdullaev@uni-bonn.de

cited in Saravanan. 2008). IWRM requires “... *the enabling environment, which includes an effective water policy, updated legislation, and conducive financing and incentive structures*” (ADB. 2008). The introduction of the IWRM also request institutionalized stakeholder participation and comprehensive water resources planning and monitoring (Shah *et al.* 2006). The enabling environment at the policy level should create space for adapting of cost sharing and recovery, water use rights approaches and making clear roles of national, regional and local governments, service providers and water user organizations, and the private sector on water management (ADB.2008).

The international donors such as UNDP, World Bank and Asian Development Bank, Swiss Development Cooperation have launched few initiatives in different Central Asian countries for the promotion of IWRM principles. For example, UNEP-DHI Centre¹ on Water and Environment, UNDP² and ADB³ are supporting preparation of the national IWRM plans for Uzbekistan, Kyrgyzstan and Tajikistan.

The centerpiece of the IWRM projects is to help national governments to prepare road maps on its implementation. This is very first and crucial step on establishing sustainable water management approach in the countries of Central Asia.

In Uzbekistan, state is funding and controlling all aspects of the water management, the legal system is protecting state ownership of all the essential water resources. Planning and use of the water resources is state's business. There is no platform or space for the water users to participate in water management process. Although this was very well fitting into the socio-political situation during the former soviet period where collective farms were major form of production this does not reflect changing social dynamics of present days. While national IWRM plans are prepared, international donors and implementing agencies should consider ongoing changes at the grass root level which will have also impact on national water management.

The research on adapting of the IWRM plans into the local situation of Central Asian countries

recently became available (Dukhovniy *et al.*, 2004, Dukhovniy and Sokolov, 2004, Abdullaev *et al.* 2008). However, recent research reflects mostly IWRM issues at the higher levels, national regional basin and main canals. Therefore, it is important to understand recent changes at the grass root levels and their impact on overall water management. The main focus of this paper is to analyze institutional changes in agriculture and their social consequences for water resources management at the former collective farm level in Uzbekistan.

The first section of the paper is describing methodology of the case study research. The second section presents post-independence changes in agriculture and water resources management in Uzbekistan, with special focus on former collective farm level after the independence and their impact on water management. The third section presents a case study from one of Water Users Association, located in Khorezm region of Uzbekistan and last section presents conclusions and lessons from of the research.

2 Research Methodology

2.1 Research Hypothesis

The main hypothesis of this paper is if socio-technical changes at the former collective farm level (grassroots) are not understood and not integrated into the IWRM plans will have long term negative impact on water management and in will alter sustainable development of the region. The hypothesis based on the explorative literature review and author's extensive work at the former collective work level in Ferghana, Khorezm regions of Uzbekistan.

Saravanan (2008) for the rural setting of the India states that the local players in the water arena apply different means for controlling the water therefore without systematic approach it is not possible to understand complicated local setting. Wegerich (2006), in his study of water management at the Khorezm region indicated that there are many players with different interest, applying different means to control water for their purposes.

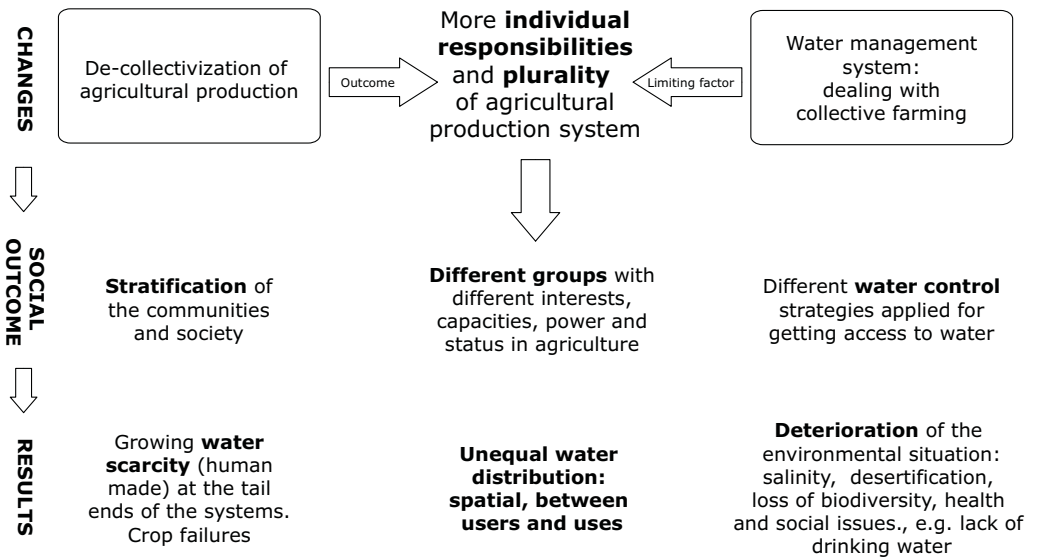


Figure 1. Research Hypothesis – impact of agricultural reforms on water management at the grass root level.

Veldwisch (2008) stated that the water management at the former collective farm level becoming more of competition and contestation between different groups. Trevisani (2007) have indicated in their studies of post soviet changes in agriculture that the land reforms have result stratification of communities in the former collective farm level. Authors have applied following framework of research in this study (figure 1): de- collectivization of agricultural production system have resulted on more individual responsibilities and plurality of the production (Trevisani.2007, Veldwisch. 2008) which have resulted formation of different groups, stratification of community and society. This has been further exacerbated due to limitation of water management system, which was designed to supply water for collective farming unit with centralized decision making (Veldwisch. 2008).

As result, different groups started to apply different water control (Mollinga. 1998, 2003) strategies for getting access (Ribot and Peluso.2003) to the water at the former collective farm level. The result of this had been seen on water distribution: it became unequal both spatially, between uses and users.

Unequal water distribution result on growing water scarcity (human made) at the tail end of the irrigation system leading to frequent crop failures (Abdullaev *et al.*2006, Wegerich. 2006. The social and environmental consequences of this has been growing salinity, desertification, drying of lakes and decline in biodiversity at the tail end of irrigation systems (Molden *et al.*2007).

Authors in this paper applied for the case study of the water management changes above presented framework of analysis.

2.2 Field Research Methodology

The methodology applied in this paper based on socio-technical analysis of water management framework (Abdullaev *et al.*2008) developed and applied within framework of German – Uzbek Landscape Restructuring Khorezm project (further Khorezm project). The centrepiece of the socio-technical analysis is “water control” (Mollinga.1998, 2003)

The main aim of the field research was to capture and documents those changes in water management

at the different levels due to the land reforms. The research was conducted in pilot WUA. The data collection and field research were based on exploratory and documentary methods, which include semi-directive, none /semi structured and group interviews with main actors, studying of project reports, data bases, research publications, archives and mass-media materials on both subject and area of interest.

A field team of 5 trained staff has been interviewing 90 randomly selected water users, located at the head, middle and tail of the irrigation network of the Water Users Association (WUA), more than ten expert interviews, six group discussions and one stakeholder meeting for problem identification were conducted during the April to June of 2008. The field team has been able to participate at least three times in water distribution and irrigation events and have conducted regular drive and walk through surveys of the WUA territory. The intensive research has helped to understand the water management situation in one of typical WUA.

Walkthrough survey of water management practices and the state of water infrastructure is the starting technique applied by author. After rapport building meetings with WUAs' staff and water users, researchers have conducted walk/drive through the main irrigation canals of the WUAs. The researchers should have mapped the area/irrigation system. The goals of the walk/drive through surveys were many-fold: updating maps, understanding irrigation network, getting known to the community, becoming familiar with technical system and noting down irrigation and water use practices of the location. *Data surveys:* researcher(s) have developed a list and protocol for the secondary data they need and have contacted WUAs for collecting readily available quantitative data. The secondary data helped to understand the main features of the irrigation system, WUAs. However, one should realize that the quality of the secondary data in most cases was low. The secondary data have included information on biophysical characteristics of the locality, data on water inflow, outflow, specificities of the irrigation and drainage system, etc. *Interviews and questionnaire surveys:*

series of interviews has been conducted with WUA leadership and irrigators in the location. *Water planning and distribution:* the water use plans of the study WUAs were reviewed together with WUA staff in order to understand how water plans are prepared, what are the major elements, data sets used and processes of water planning. During the peak irrigation season (June-July), one or two times the water inflows (discharges) into study WUA and water distribution quantities canals were measured. The data used to understand spatial differences on water distribution between different parts of the canals. The measurements conducted simultaneously in all above mentioned points of the irrigation system in order to capture actual situation (Abdullaev *et al.* 2006). *Participation and observation technique* was frequently applied to understand the socio-institutional aspects. Attending both formal and informal meetings, socializing through friendships and networking were essential methods appropriate for the study area.

2.3 Study area- Khorezm region

The Khorezm region in Uzbekistan is biophysically representative for the irrigated Amu Darya lowlands of Central Asia, which comprise the entire irrigated land (1 060 000 ha) between the Tuyamuyun reservoir and the Aral Sea: the province of Khorezm (275 000 ha), the Republic of Karakalpakstan (500 000 ha), both in Uzbekistan, and the province of Dashoguz (310 000 ha irrigated land) in neighbouring Turkmenistan. The region well represents those of post-independence changes in agriculture. Since 1991, in place of only few hundred collective thousands of private farms were organized. The total irrigated area accounts for about 10% of the entire Aral Sea Basin (ASB). The total population of 3.5 million people corresponds to about 10% the entire population in ASB. Of the 1.3 million people living in Khorezm, about 70% are rural and about 27.5% live below the poverty line (1 US\$ per day); unemployment rates especially in rural areas, are high (Mueller *et al.* 2007).

Khorezm province is located in the lower part of the Amu Darya basin, approximately 225 km south of the remainders of the Aral Sea in Uzbekistan. Due

to the arid climate, characterized by an average annual precipitation of around 90 mm contrasting a reference evapotranspiration in the range of 1150 mm, the agricultural systems in Khorezm depend entirely on irrigation to provide adequate soil moisture. The generally acknowledged high losses of irrigation water have contributed to the widespread shallow groundwater tables. Drainage is necessary to ensure an effective leaching, to limit soil salinity accumulation to levels appropriate for crop production, and to avoid water logging.

Topography in Khorezm is flat (with elevation points ranging between 112 and 138 m a.s.l.) complicating the discharge of drainage water. As a consequence, an area of around 275 000 ha has become suitable for irrigated agriculture owing to the irrigation and drainage infrastructure which consists of a complex network of 16 233 km irrigation channels and about 7 679 km of drain (Table 1). With an exception of around 10 % lined canals (Ibrakhimov 2005), the irrigation system consists of earthen canals, whereas especially in the lower hierarchy system levels hydraulic structures are missing or dysfunctional. Drainage is realized by a network of open ditches and collectors. Irrigation water in the field is applied mainly by furrows and basins. Pre-season leaching is performed by basin. Furrow lengths and basin sizes are relatively small to compensate the effects of typically irregular micro-topography of the fields caused by insufficient land-levelling. Annually, about 3.5 to 5 km³ of water are diverted to Khorezm from the Amu Darya River. About 95 % of supplied water is used by agriculture (Conrad et al. 2007). Due to huge recharges caused by losses in the network and at field level as well as the low groundwater slope and a general ill-functional drainage system, groundwater tables in Khorezm are shallow. Even though high groundwater tables at certain periods during the growing season may be advantageous, e.g. contributing to meet crop water requirements, shallow groundwater tables have adverse impacts on the irrigated agriculture in Khorezm due to increasing salt accumulation in the root zone, limiting the effectiveness of leaching, and causing waterlogging.

2.4 WUAs- research domain

At the end of the 1990's, the Uzbek government initiated the formation of Water Users Associations (WUA). Although WUAs in Uzbekistan were organized in a top down, hierarchical manner, using power and resources of the state water management organizations, their formation *per se* was a much needed step for stabilizing irrigation management at on farm level (Zavgordnyaya 2006, Wegerich.2000).

Most of the WUAs in Uzbekistan, which have not been supported by donor interventions, are failing on operation and maintenance of the irrigation and drainage network, have difficulties of managing water within the administrative boundaries and suffering from weak management and governance structures. Although the structure of such WUAs involves managing players mainly (Zavgordnyaya, 2006) practice showed that the water users were hardly consulted, nor informed about the way water management was reorganized. Therefore, the water users considered the WUAs as another water administration imposed on them, and not a way of introducing collective action water management.

In this research WUAs were the central focus area for socio-technical analysis of water management systems. Five WUAs, located in different biophysical, social and institutional conditions:

- i. *Remoteness from the water sources* (Conrad et al. 2007): two WUAs with less than 30 km from water source, two WUAs more than 30 km but less than 60 km and one WUA more than 60 km;
- ii. *Relative water scarcity*: three WUAs which received 100% of allocated water share (limit) in the previous season, one WUA received 85% of the limit and one WUA only 70% of the limit;
- iii. *Social situation, living standards, diversity of agricultural activities*: two WUAs with relatively high income levels due to their close location to the regions capital city Urgench and high income due to rice

growing, diversified agriculture- vegetables, livestock and cotton-wheat, one WUA with medium level of living standards due to good infrastructure and closeness to main road Urgench - Khiva, agriculture is diversified- orchards, vegetables, cotton and wheat, one WUA with relatively low living standards due to the collapse of industry in the main town where most of the settlers were working, the last WUA has very low living standards due to remoteness and water shortage which result in low agricultural productivity, mostly cotton-wheat with only few orchards and livestock farms;

- iv. *Institutional strength and type of water management*: all WUAs were organized by state through a top-down administrative approach. Two WUAs have received considerable support from international donor-funded projects. Two WUAs has hydrological borders and three organized in place of the former collective farm.

Although the above indicators do not fully reflect the diversity and differences between WUAs, they help to capture at least most types of WUAs in Khorezm region. In this paper author reports the findings from WUA Koshkopir Ashirmat. The Water Users Association (WUA) Koshkopir Ashirmat has 2116 ha of irrigated land. The irrigated areas are receiving the water from the Zeu Yop canal which is fed by Polvon main canal - one of the largest irrigation networks in Khorezm region.

3 Results and Discussions

3.1 Post soviet changes and emerging water governance issues at the grass root levels

With the collapse of the Soviet Union, Uzbekistan has inherited large-scale irrigation systems which occupied several millions of hectares. The irrigation system and main water sources of Central Asian countries are interconnected with each other but belonging to different countries. With continuing agricultural, land and water reforms, at different stages of development, agriculture became the backbone of the economy of at least Uzbekistan.

The agricultural reforms have had impact on water management (table 2).

Later, large farms were fragmented into a large number of smallholdings owned and managed by individuals and each owner growing different crops according to the demand of either government, the market or personal needs. The irrigation water allocation procedures, based on crop type and environmental indicators became irrelevant and inaccurate due to the absence of accurate cropping records.

Water management at the main canal and basin levels did not change until the late 1990's. The basin principles of water management (hydrographic) were introduced in 2003. The territorial water management units at different levels were replaced by hydrographic units, such as basin irrigation system management organizations (BISMO) and canal management organizations (CMO).

Immediately after the independence in 1991, the governments of the Central Asia introduced land reforms, transforming collective farms (locally known as *kolkhozes*) into individual farms. The aim of this transformation was twofold: first to abolish the soviet legacy and the second to revive the productivity of the than bankrupt collective farms (Spoor, 2004). During the reforms, the social and organizational structures of collective farming, including one regulating the water management has been abolished alongside with collective farms. On- farm irrigation and drainage infrastructure, formerly managed and maintained by collective farms were left abandoned. The water distribution became an issue of social interaction, a place of contestation and competition (Wegerich 2000, Abdullaev *et al.* 2006).

The impact of land distribution on water management on farm level was initially ignored. In the former collective set up, the number of secondary water users ranged between 10 to 15 units (*brigades*) and water management was linked to the agronomic operations and readiness of the land to be irrigated. Trained and experienced staff, agronomists and hydro-technicians had been employed in every collective farm and

Table 1. Main information on study WUAs

#	WUAS	REMOTENESS FROM WATER SOURCES	RELATIVE WATER SCARCITY- HOW MUCH FROM WATER SHARE WAS DELIVERED	SOCIAL SITUATION, LIVING STANDARDS	INSTITUTIONAL STRENGTH AND TYPE OF WATER MANAGEMENT
1	A. Timur	Middle located from water sources More than 30 km but less than 60 km	85% water share	Relatively high living standards due to closeness to the main market in Urgench, growing mainly vegetables for sale. Diversified agriculture- vegetables, livestock and cotton-wheat	Has received considerable support from international projects. Territorially organized water management, middle of the irrigation system
2	Ashirmat	Tail located from water sources >60km	Less than 70% of water share	Very low living standards due to remoteness and water shortage as results low agricultural productivity. Mostly cotton-wheat with only few orchards and livestock farms	Water management is organized by hydrographic- canal borders- tail end of the irrigation system
3	Shomahlum	Middle located from water sources More than 30 km but less than 60 km	100% of water share	Medium living standards, access to good infrastructure and closeness to main road Urgench- Khiva Agriculture is diversified- orchards, vegetables, cotton and wheat	Has received considerable support from donor funds and Uzbek Ministry of Agriculture as pilot site for testing irrigation service fee introduction water management is territorially organized,
4	Amudarya	Located on the right bank of Amu Darya river, north of Khorezm less than 30 km from water sources	100% of water share (limit)	Relatively high living standards, large areas are rice growing. Agriculture is relatively diversified, mainly rice and cotton-wheat system	Water management is organized by hydrographic- canal borders- head of the irrigation system
5	Akalan	Located 30 km from Tuyamuyun water reservoir	100% of water share (limit)	Relatively low living standards due to the collapse of industry in the main town where most of the settlers were working. Only cotton-wheat system	Water management is organized by territorial principles-head of the irrigation system

were mandated to overlook the irrigation water management. Former members of the collective farms as well as citizens with no agricultural experience became individual farmers. The land reforms have led to a big increase in the number of individual farm units along secondary and tertiary canals. Given the new setting, the former methods for water distribution, as applied under the former large-scale collective farming system, have become irrelevant, leading to much chaos, inequity and unreliability in water supply to farmers. The formerly, during the collective farming times the tillers or members of the collective farm had no interest on influencing the water distribution. The state has been insuring the supply of all inputs into the collective farm because the state was receiving larger share of the outputs. However, after the de-collectivization situation has been changing, now individual farmers, land owners have much more share on outputs and they have an interest on influencing water management that they get water on time and enough amounts. Thus, many farmers and water managers have had to resort, with variable success, to some alternative water distribution methods to meet these new challenges. Nevertheless, transparency and equity in local water use still remains an issue. The competition and contestation on water distribution further exacerbated due to the increasing plurality of agricultural operation and production systems. The poor state of the irrigation and drainage (I&D) networks have further exacerbated the water management situation at the former collective farm level (further called as grass roots level).

In Uzbekistan, changes the irrigation water management were mainly concentrated on transferring management responsibility to water users associations at secondary canal levels. Planning, distribution and management at the former collective farm level became the business of Water Users Associations (WUAs). Although WUAs in were organized in a top down, hierarchical manner, using power and resources of the state water management organizations, their formation was a much needed step for stabilizing irrigation management at on farm level (Zavgordnyaya 2006, Wegerich.2000).

Most of the WUAs, which have not been supported by donor interventions, are failing on operation and maintenance of the irrigation and drainage network, have difficulties of managing water within the administrative boundaries and suffering from weak management and governance structures, because the structure of such WUAs involves managing players only (Zavgordnyaya, 2006) as the water users are neither consulted, nor informed about the way water management was reorganized.

Therefore, the water users consider the WUAs as another water administration imposed on them, and not a collective action organization of their own. Although the roles and responsibilities of state water management agencies and WUAs are attributed clearly, in daily water management their interests and operations clashes regularly due to external administrative interference and growing interest by makes effective water management almost impossible.

The growing individual responsibility for agricultural production pushes the farmers to get access to all inputs of production, including water. Other inputs (e.g., fertilizers, seeds, etc.) are available either by state run or commercial shops or in this chain of inputs only water is becoming an uncertain and contested input. Therefore, individual farmers apply different means (power, money, technology and resistance) for getting access to water for irrigation of their crops. The contestation of the water distribution at the grass root level (former collective farm territory) became a regular practice. In the context of increased dynamics over water and emerging social and production differences in the grass root levels in Uzbekistan have long-lasting impact on water management. At present the functions and structure of WUAs do not reflect those changes.

Table 2: Changes in Agriculture and Irrigation Water management

TIME	CHANGES IN AGRICULTURE	OUTCOMES/ RESULTS	TIME	CHANGES IN WATER MANAGEMENT
Starting from 1999-2006	De-collectivization and individualization of agricultural production	Formation of individual farms	Mid 1990's until now	<p>Numbers of secondary water users-farmers have been increased which lead to the increased competition at the former collective farm level on water</p> <p>Testing and organization of pilot WUAs to fill gap at the grass root levels</p> <p>Formation of hydrographic water management organizations from national level until main system canal level</p> <p>Interstate water management agreements and formation of institutions</p> <p>Preparation of road maps on national IWRM plans in Kazakhstan, Kyrgyzstan and drafting it for Uzbekistan and Tajikistan</p>

3.2 Emerging Water Control Strategies in Irrigated Agriculture: case Study from Water Users Association in Khorezm Region of Uzbekistan

3.2.1 Analysis of existing situation at the grass root levels

According to widely accepted principles of IWRM, the WUAs should become as grass root institution for representing the interests of wide range of water users (GWP.2000, Khanal. 2003). However, WUAs in Uzbekistan although repeat in their by-laws the same structure as elsewhere in the world (IWMI.2002, MAWR.1999) in practice act very differently. They are act as branches of water management organization or busy with implementation of top down, daily instruction of local government officials (Zavgorodnya.2006, Weigrech.2006). The case study, presented in this section from WUA Koshkopir Ashimat from Khorezm region illustrates the problems on water management and emerging trends at the grass root levels.

The Water Users Association (WUA) Koshkopir Ashimat has 2116 ha of irrigated land. The irrigated

areas are receiving the water from the Zeu Yop canal which is fed by Polvon main canal- one of the largest irrigation networks in Khorezm region. The human made water scarcity due to the competition on water resources at the head of the Zeu Yop canal result that a considerable part of the irrigated agricultural fields in the area are 'abandoned' –150 to 200 hectares were not cultivated in the last years. These fields have been left by farmers and are regarded unsuitable for cultivation at the moment due to water scarcity. The WUA is located at the tail of the system and has problems with water provision.

The water to the WUA Koshkopir- Ashimat is delivered through territory of other three WUAs, located above study area. This situation creates an unsustainable and non-reliable water supply. Although the irrigated area within the command system of Zeu Yop canal has not been increased, the water supply to WUA has become very much contested by both WUAs and individual water users along the canal. This is due to the two interrelated issues on WUAs formation and operation. The first issue, WUAs in Uzbekistan were organized in place of territorial collective farms not by hydrographic borders. Therefore, it is usual that water should flow through one WUA to other WUA, this

situation have result continuous conflict on water distribution between WUAs.

The second issue is that WUAs are not allowed to form federations along the main canals. The state Water Management Organizations (WMOs) and local governments are strictly guiding WUA Chairmans on daily operations. The daily water distribution decisions are made at the office of district governor (hakim in Uzbek). There is no viable role for WUAs to cooperate and come up with arrangements with each other. As results WUAs along the same canal not cooperate with each other rather compete for water. Therefore, the message to the IWRM plan developers is that the new legal system under IWRM should have reflect the need for hydrographic borders for WUAs and provide scope for WUAs federate along the main canals.

The de-collectivization has resulted in different socio-political situations and led to the formation of different interest groups in the area. There are at least three different groups of farms in rural Uzbekistan (Trevisani, 2007). The first group of farms are under state quote, growing cotton and wheat for the state with 10 to 20 ha of irrigated land, the second group is growing more commercial crops, such as rice, vegetables and fruits with land sizes around 1 ha and less. The third group is smallholder landowners which grow mainly crops for the subsistence of their livelihoods. However, some time state quota farming also may grow rice and he may have a smallholder land in their backyard (Veldwisch, 2008). The social differences in grass root level in study WUA have not yet been realised as strong as it has in societies with strict social stratification. However, the different groups started to apply for getting access to the different resources, including for water. For example, the farmers with larger irrigated land and higher incomes are buying diesel or electric pumps for organizing irrigation of their fields. Although they do allow neighbouring farmers and smallholders but only if they pay for the cost of operation of the pump. The smaller land owners and weaker groups are not represented in WUA structures at present. The standard bylaws of WUAs establish membership on the base of land ownership, only heads of the registered farm units

can become a member. However, most of medium (up to 1 ha) and smallholder (less than 0.5 ha) are not registered as farm units. This already created inequality and WUA is not representing all water user of the area. Therefore, it is very important to have mechanism for inclusion of the small farming units and water uses for other purposes, lakes- fishing, construction (brick making) and the households who depend from the irrigation network for their water for daily uses (drinking purposes, etc.). In study WUA there are three lakes where people catches the fish, many families are using the irrigation network for household use. However, they were not members of WUA.

The positive changes at the grass root level was that the collective actions of water users are emerging - they do joint pump management, take care of maintenance of the irrigation and drainage network of their location, and act as a group for acquisition of water for their area through social activities. They use irrigation and drainage infrastructure, technologies such as use of pumps, re-fixing of the water regulation gates, etc. This could be a potential option for strengthening of WUAs, the water users at the different channels of WUA forming collective action groups for short periods, until they get water into their areas. Carefully planned social mobilization activities by WUA management may help to turn this temporary collective action into more systematised water users groups (Abdullaev *et al.* Forthcoming).

The WUA also trying to get out from the situation they are at present, one of such attempts is to assign the pumps to the individual farmers. The operation and maintenance of the pumps, especially payments for electricity use was heavy burden on WUAs. 10 pumps, formerly owned by WUA were assigned to the cotton-wheat farmers who have access to the state credits and subsidized inputs. When pump was belonging to the WUA, the cost of pumps was evenly distributed among the members- large farmers, the smallholders have not paying for the cost of pumping. The large farmers were charging their costs on pumping against state credits paid for the cotton or wheat. However, in most cases the payments were delayed and WUA was fined for non-payment.

The assignment of the pumps to the individual farms helped WUA to reduce debt from Electricity Company and led to the formation of water users groups around the “privatized” pumps. Although this was positive for short run in long run may result inequality to the access. For example, pump owners started disconnect non-payers from the pump. If we consider that 75% of irrigated lands need pumping of water (BUIS.2008) then most of smallholders also depend from the pumping. Most of the smallholders have not enough economical means to buy pumps and pay full cost of the pumping from farmers pump. Therefore, “privatization” of the pumps and other assets of the WUA to the individual users although economically sound should consider potential social consequences.

3.2.2 Responses of water users on water situation at the grass root levels

During the field research authors have conducted series of surveys with different water users (farmers, smallholders and non-irrigation water users). In total 50 farmers, 10 smallholders and 10 non-irrigation water users were interviewed in each of study WUAs. In this report authors present the responses from farmer group (both cotton-wheat and commercial). The respondents were selected from head, middle and tail of the secondary canal which feeds WUA. Therefore, responses of water users are also analyzed according their location. The responses are presented in % from the total number of water users interviewed in the each reach of the canal.

The first question, which will help shed a light on water situation with WUA is “did you get enough water this year (2008)?” Survey results indicated that 20% of the respondents at the head of the canal responded positively to this question, at the middle of the canal 18% and at the tail end only 3% of the respondents got enough water for the irrigation (table 3). This was mainly related to the overall water scarcity of the season⁴ and the fact that the WUA located at the tail end of the irrigation system. However, the survey results quite clearly indicate the difference on getting enough water between different reaches of the canal. There are clear head-tail differences on water distribution.

The next question respondents were asked was about the reasons of not receiving enough irrigation water – “Why do you think you could not receive enough water?” The respondents have given 7 choices to tick. The choices were identified during the joint problem identification workshop, organized for the WUA area, 67 farmers and other water users, staff of WUA have participated in group works to identify major water problems and reasons for water shortage in the area.

Most of the respondents located at the head of the canal have indicated that they do not know reasons for not receiving enough water, 9.8% of them indicated that water distribution inequity, timeliness and time of water release as main reasons for the problem (table 4). In the middle reach, the respondents have indicated as major reason for not receiving enough water timeliness and scarcity of the water in the river.

Only 7.8% of the respondents at the head and 5.9% at the middle have indicated as reason for not receiving enough water the problem of water delivery to the WUA. Strikingly, 56.9% of the tail end water users have indicated this as main reason of the problem. This response indicates that the tail enders are more concerned with water inflow into WUA and they expect that more water would give more chances to them get enough water for their irrigation needs.

The concern over water distribution equity in the WUA canal was reflected in the 9.8% of head, 17.6% of middle and 11.8% in the tail end respondents. This again confirms message that the tail enders perceive that even more equal water distribution will not increase water for them. The head located water users are not too much concerned with water distribution equity.

The survey had questions on assessing the WUA performance, respondents were asked to grade performance on WUA. They were given 5 choices to assess the WUA performance: bad, not good, satisfactory, and good and not to give any response (I don't know). The respondents located at the head of the canal have given 40% good and 60% satisfactory rate for WUA performance (table 5). At the middle

Table 3. Did you get enough water this year?

LOCATION OF WATER USER ALONG THE SECONDARY CANAL	RESPONSE FROM WATER USERS	PERCENT	VALID PERCENT
Head	yes	20	20
	no	80	80
	Total	100	100
Middle	yes	18	18
	no	82	82
	Total	100	100
Tail	no answer	3	3
	yes	3	3
	no	94	94
	Total	100	100

good rate was 45.5%, satisfactory 36.4% and not good 9.1%, the same % of have responded as they do not know.

At the tail end, the good rate reduced to 32.4%, satisfactory was 50%, not good rate was 14.7% and bad rate was 2.9%. In all reaches more than 80% of interviewed water users have rated WUA performance in average satisfactory or good. This may be linked to the fact that WUA management has been trying very hard to bring some water during the whole season. Therefore, the water users when they were asked to rate WUA performance they have assessed the efforts of the WUA but not results.

3.2.3 Socio- technical nature of water management at the grass root level

Participation in the daily water management practices and close observation of the water management have helped to understand those of strategies water users, WUA managers apply during the irrigation season. Following were few of those strategies observed in study WUA:

- WUA Chairman, through his relations in the local government was able to get the appointment of someone from high ranks

of the WMO as a *vakil* (representative of province or district governor) for his area. Consequently, the *vakil* who is responsible for all agricultural operations in the area, starting from sowing until harvesting, was pushing all WMO staff hard to guard and deliver water to the WUA where he is *vakil*.

- WUA chairman and other local authorities use their links in Electricity Company to switch off the electricity during the peak time for the water demand. Due to the absence of electricity, pumps above the Ashirmat WUA did not work and water reaches Ashirmat WUA for irrigation.
- When water at the tail-end of the canal became so scarce that it threatened the yield of the farmers, they collectively appeal to the governor to help and a pump was installed at the biggest collector to deliver drainage water to the tail-end farms.
- People of villages irrigating their *tomarkas* (smallholder) blocked the water flowing to other areas and women guarded these blocks. The women aggressively defended the water from others. Men cannot force women to

Table 4. Why do you think you couldn't receive enough water?

LOCATION OF WATER USERS ALONG THE SECONDARY CANAL	ENOUGH WATER WAS NOT DELIVERED TO THE AREA OF WUA	WATER WAS NOT DISTRIBUTED EQUALLY WITHIN CANAL?	WATER WAS NOT DELIVERED IN TIME?	WATER WAS DELIVERED BUT IRRIGATION TIME WAS NOT ENOUGH	WHEN THERE WAS WATER PUMPS WERE NOT WORKING	NO WATER IN RIVER	I DON'T KNOW
Head	7.8	9.8	9.8	9.8	7.8	7.8	47.1
Middle	5.9	17.6	21.6	19.6	13.7	21.6	0.0
Tail	56.9	11.8	3.9	2.0	2.0	2.0	21.6

Table 5. What do you think how WUA performs?

LOCATION OF WATER USER ALONG THE TERTIARY CANAL	INDICATOR	PERCENT	VALID PERCENT
Head	satisfactory	60.0	60.0
	good	40.0	40.0
	Total	100.0	100.0
Middle	I don't know	9.1	9.1
	not good	9.1	9.1
	satisfactory	36.4	36.4
	good	45.5	45.5
	Total	100.0	100.0
Tail	bad	2.9	2.9
	not good	14.7	14.7
	satisfactory	50.0	50.0
	good	32.4	32.4
	Total	100.0	100.0

open/close offtakes (ethnically in Khorezm and elsewhere in Uzbekistan a man cannot use force against women who are not his relatives).

Above examples are showing that a variety of strategies, such as relationship with local governor, use of electricity blackouts and non-violent social pressure were applied to get access to water by individuals and groups of people. There are frequent interferences by local governments at the grass root levels due to the fact that water users involve them

through different means. Although the administrative interference at the study WUA was effective on short run it may become a negative incentive towards developing viable WUAs. The water users during the interviews and problem identification workshop have been grading local governor as an institution which deals with water management.

4 Conclusion

The IWRM diverse and a political process, and a concept in search of constituency (Mollinga, 2007). The forms of integration are not always tangible, but at any given time, are only realised through linkages between pre-existing activities across decision-making arenas. This requires replacing ideological approaches with 'strategic action' approaches that acknowledges the inherent political character and plurality of actors, institutions and objectives of water management (Mollinga, *et al.*, 2004). Therefore, authors in this paper tried to shed a light on on-going developments in water management at the former collective farm level.

The post soviet changes in agriculture sector result on increasing of numbers of individual farms, although state has still strong control over the water management, this case study shows that there are new set up emerging at the grass root level. The different groups of the water users and other players apply different means to get access to the irrigation water. In long run this tendency may result social differentiation and most powerless groups may be affected.

The research has helped to understand major issue or problems WUAs face in Uzbekistan. One of the problems WUA are facing is the absence of the platform for coordinating of water efforts at the main canal level which would help to produce more. There is convincing success in

water management, in the Ferghana region of Uzbekistan, where such federations were allowed (Abdullaev *et al.* 2008). It is obvious from the case study that the WUA are malfunctioning at present. The institutional analysis of study WUA has helped to highlight problems which WUA currently facing. The solution of the problems highlighted in this research requires more strategic steps to be taken, e.g., update on water law, introduction of WUA law, which describes role and status of WUAs in water management system. Therefore, required action plan can become part of the IWRM plan for the country. Unfortunately, in elsewhere in the world the complex social and political processes on water management at the grass root levels, where interaction of many different players are taken place (Saravanan. 2008) have largely been ignored. As result, poor farmers and smallholders has been also limited on their access to water which is the crucial resource for their livelihoods. There is great chance to avoid this at least in Uzbekistan and elsewhere in Central Asia through better understanding socio-technical aspects of water management at the grass root level and integrating required policy decisions into the IWRM plans.

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Endnotes

1. For details see <http://www.ucc-water.org/>
2. For details see <http://europeandcis.undp.org/environment/show/3D2B761C-F203-1EE9-B438534DF68252D7>
3. For details see <http://www.adb.org/Water/WFP/basin.asp>
4. Information on water situation is available at http://www.cawater-info.net/amudarya/index_e.htm

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WATER AND SOCIAL CHANGES IN CENTRAL ASIA: PROBLEMS RELATED TO COTTON PRODUCTION IN UZBEKISTAN

Rachel Strickman¹ & Miina Porkka²

¹ Department of Environmental and Biological Sciences, University of Helsinki, Finland

² Department of Civil and Environmental Engineering, Helsinki University of Technology, Finland

Decades of water mismanagement in Central Asia have caused a range of problems that have direct and indirect social consequences. Using the IWRM framework, this paper describes how pollution, water scarcity, the destruction of the Aral Sea, and the cotton industry have caused human suffering in Uzbekistan, which was selected based on its wide range of water related problems and good availability of information. This brief overview concludes with a short description of the internal reforms, improved international cooperation, and water management improvements that are being used to address these problems.

1 Introduction

Access to water is a basic human need and should be a fundamental right. And yet, in Central Asia and throughout the developing world, more than one billion people are denied access to clean water (UNDP, 2006). Increasing demand for water for agricultural and industrial purposes, together with environmental degradation and pollution, have made water into a scarcer resource, which in turn makes it even more important that it be managed in a just, rational way. Even under conditions of water scarcity, it is possible to manage water in a socially

responsible manner; but there are many examples of regions where water shortage combined with water mismanagement have transformed water from an environmental issue to a social one.

In Central Asia, as in many other areas, water—or its lack—is a prominent cause of human suffering. (GWP, 2008). Irrigated farming, particularly cotton production, consumes large volumes of water which are withdrawn from the Amudarya and the Syrdarya, the two main rivers feeding the Aral Sea. This unsustainable water use has affected the ecology, hydrology, and general environment in the region, with expanding knock on effects on agriculture, industry and society (UNEP, 2005). The shrinkage of the Aral Sea is the most visible and severe of these negative impacts, but freshwater shortage is obvious in other waters of the basin as

Corresponding author:

Rachel Strickman

Department of Environmental and Biological Sciences,
University of Helsinki,

Kurkisuontie 9 D 37, 00940 Helsinki, Finland

E-mail: rachel.strickman@helsinki.fi and mporkka@cc.hut.fi

well. Water contamination from irrigation effluent is widespread and detrimental to human health (UNEP, 2005). Water scarcity and water pollution are facts of life in the region.

The misuse of water in Central Asia has created many social problems, including economic, civil rights, and health issues. This paper uses the IWRM framework to link the economic and environmental problems of water misuse with their implications for society. Uzbekistan was selected as a focal location within Central Asia for which to examine these questions, because it encompasses a wide range of hydrological regimes and an associated wide range of water-related social problems. In conclusion, the initiatives currently underway in Uzbekistan to meet these problems are described.

2 IWRM & Social Impact Assessment

Solving the social problems that arise from the misuse of water demands that we understand what the problems are and how they are linked to water. Experience has shown that managing and sharing natural resources equitably is extremely difficult. Perhaps the most serious difficulties are in understanding the subtle linkages between action and result. One way to make sure that all these linkages have been considered is to use a mental framework to organize topics and facilitate discussion. One of the most robust of these mental frameworks is integrated water resource management (IWRM). The concept of IWRM has been defined by Global Water Partnership as 'a process which promotes the coordinated development and management of water, land and related resources in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems' (GWP, 2000). Although IWRM works best as a planning tool, it is also a useful framework for identifying where existing problems come from and how they are linked to other issues.

One of the basic principles of IWRM is that different uses of water are interdependent. Managing water resources has an effect on the whole system (e.g.

river or sea basin), including land use, agriculture and the environment. Management plans also have economic and social impacts. It is therefore essential that water is managed in a basin-wide context and that any decision making takes into account the relations between economic, social, and environmental impacts. Good governance and public participation are also seen as essential to a good water management plan (Rahaman & Varis, 2005).

The social dimension of IWRM deals with issues such as poverty, health, equity, empowerment and marginalization. All of these issues can be connected, through one or more links, with water. For instance, across the developing world many people are excluded from access to clean water and adequate sanitation by their poverty or their limited legal rights. Denying this access often leads to serious health problems (UNDP, 2006). In many countries, including Central Asian states, women play a key role in agricultural production but seldom have any rights to the land they work (Kandiyoti, 2003). This may lead, for instance, to their exclusion from irrigation system management (UNDP, 2006). The social dimensions of water management are often indirect, but they are nonetheless as important as economic development or environmental restoration.

Different actions and tools are used to quantify social impacts and to help achieve a dynamic approach to planning the management and development of water resources. One of the tools that should be included in a good water management plan is social impact assessment (SIA) (GWP, 2008). Social impacts include all the social and cultural consequences of a certain action that affect people, either directly or indirectly. Social impact assessment is a tool for analyzing, monitoring and managing the social consequences of a development or policy action. An SIA study assesses how costs and benefits of a certain action are distributed between different stakeholders and how vulnerable groups will be able to cope with the changes (GWP, 2008).

Social problems are often linked with environmental changes that derive from a policy or management

action. A framework of Slootweg *et al.* (2001) (Fig. 1) presents the ways by which a specific project can lead to environmental and social impacts. An intervention causes environmental changes which may or may not lead to environmental impacts. In the same way social impacts derive from social changes caused by an action. Social impacts can also be caused by environmental impacts and, on the other hand, social changes may lead to environmental changes. First-order changes, i.e. social and environmental change processes resulting directly from the intervention, can then lead to several other change processes (Slootweg *et al.*, 2001). This feedback mechanism is also presented in the framework.

In Central Asia many social problems are caused in much the same way (Fig. 2). In this case the crucial action was the heavy promotion of cotton production after the Russian conquest, which causes social problems via two routes. First, it has led to serious and negative environmental changes via overirrigation, pollution, and the destruction of the Aral Sea (UNEP, 2005), which has led to serious human impacts. Secondly, the cotton

industry itself has created many social problems, through its unjust and unequal methods of production, coordination, and distribution (ICG, 2005). Although these problems—for instance, the economic exploitation of cotton pickers by farm managers—are not technically the result of water misuse in that they could occur even if water were abundant, the cotton industry is such a massive user of water, and the cause of so many water related problems, that it may be said to be a water-related problem in and of itself. In the sections that follow, the social problems resulting from these issues in the context of Uzbekistan are discussed.

3 Social Problems Resulting from the Misuse of Water in Uzbekistan

Renewable water resources in Uzbekistan are very limited (Table1). Uzbekistan is situated in the basins of Amudarya and Syrdarya, the two rivers feeding the Aral Sea, but only about 10% of the region's total annual river run-off is formed in the country. Yet it consumes, on average, approximately 54% of water resources in the region (UNEP, 2005). In the driest years, the Amudarya

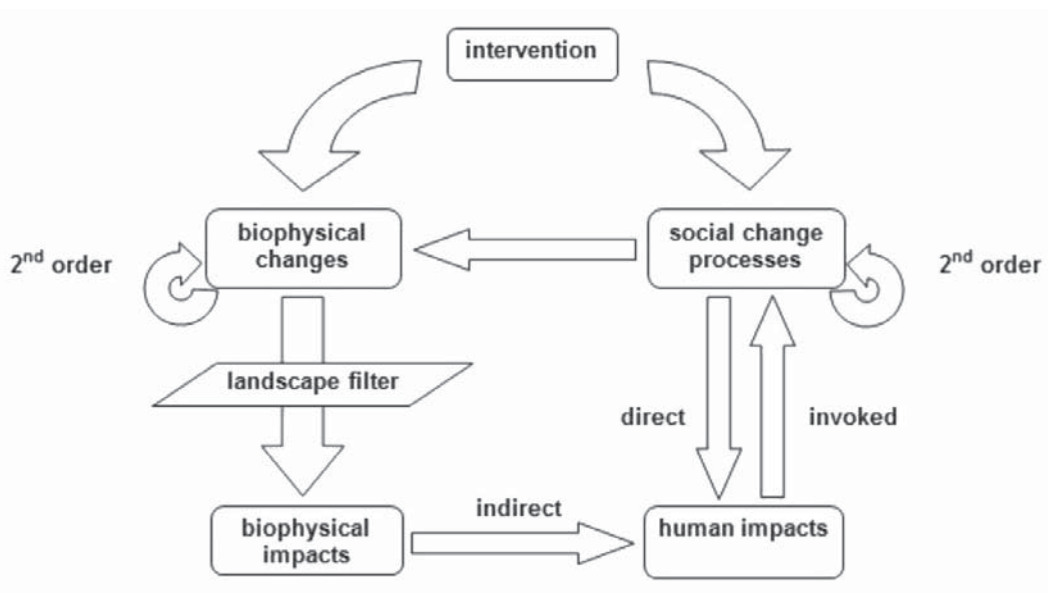


Figure 1. Integrated framework for environmental and social impact assessment. Source: Slootweg *et al.*, 2001.

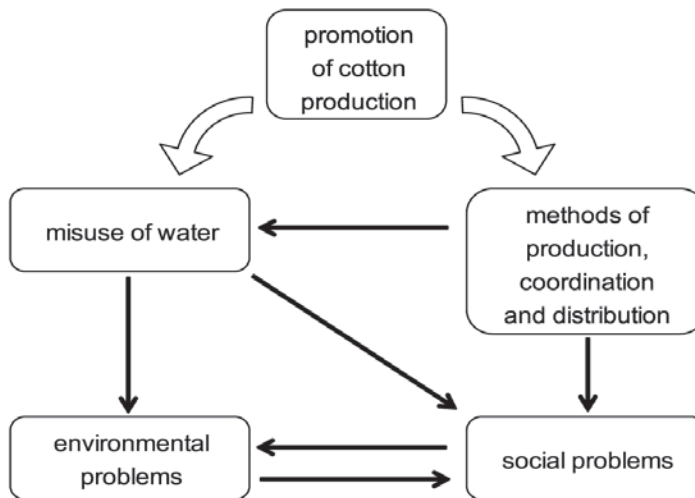


Figure 2. Environmental and social changes related to cotton production in Central Asia.

flow can be less than 10% of the river's total run-off when it reaches the Aral Sea in Uzbekistan (FAO, 1997). The country uses about 134% of its actual renewable water resources, agriculture being the biggest consumer (FAO, 2008). As a result of the discharge of drainage waters from irrigated lands, this notable freshwater shortage is accompanied by poor water quality (UNEP, 2005).

The overuse and contamination of water has caused serious environmental degradation and accompanying social problems throughout Central Asia (UNEP, 2005). Conflict over water, environmental damage, and the special problems resulting from the destruction of the Aral Sea have all caused serious difficulties. In addition, cotton production—the main consumer of water resources— is linked with many social impacts.

4 Sociopolitical Causes of Water-related Social Problems

4.1 Conflict

Central Asian nations have had difficulty coordinating the use of their shared water resources, leading to international tensions and problems for ordinary people. The Interstate Commission

for Water Coordination (ICWC) is charged with assigning water quotas, monitoring water quality, and coordinating water use throughout the Aral Sea Basin. The ICWC suffers from a lack of funding, perceived bias in favour of Uzbekistan, obstructionism, and an inability to enforce its decisions (McKinney, 2003). Other coordination problems include aligning water management schemes and standards, allocating water fairly, discouraging water waste, and international cooperation towards funding the maintenance of infrastructure (McKinney, 2003; Elhance, 1997; Weinthal, 2000). Central Asian nations suffer as well from the history of centralized water management (McKinney, 2003). Upstream development of irrigated agriculture or hydropower can impact downstream users, causing destructive winter flooding or summer drought (Elhance, 1997).

Conflict exists within Uzbekistan as well. The lack of water increases tensions between different stakeholders, social groups, and individual farmers (UNEP, 2005). In some areas, unequal distribution of water is seen as one of the most important problems, and water disputes are common (Wegerich, 2000).

Uzbekistan is keenly aware of its dependence on upstream water resources, which can cause tension between the governments of Uzbekistan

Table 1. Renewable water resources of Uzbekistan. Source: FAO, 2008

UZBEKISTAN WATER RESOURCES	KM ³ /YEAR	%
INTERNAL RENEWABLE WATER RESOURCES		
Surface water produced internally	9,54	
Groundwater produced internally	8,80	
Overlap	2,00	
Total internal water resources	16,34	
EXTERNAL RENEWABLE WATER RESOURCES		
Surface water entering the country	55,87	
Outflow secured through treaties	21,80	
Groundwater entering the country	0,00	
Groundwater leaving the country	0,00	
Total external water resources	34,07	
TOTAL RENEWABLE WATER RESOURCES		
Total renewable surface water	43,61	
Total renewable groundwater	8,80	
Overlap	2,00	
Total renewable water resources	50,41	
FRESHWATER WITHDRAWAL		
Agricultural water withdrawal	54,40	93,20
Domestic water withdrawal	2,77	4,75
Industrial water withdrawal	1,20	2,06
Total freshwater withdrawal	58,37	
Freshwater withdrawal as % of total renewable water resources		116

and upstream nations. However, like other Central Asian nations, Uzbekistan feels that agreement and cooperation are by far the best way to manage water resources, and there has been a heartening lack of armed water-related conflict in the region. The government of Uzbekistan took an important step towards reducing water-related conflicts when it ratified the UN Watercourses Convention (1997) on 14 September 2007. Today, Uzbekistan remains the only Central Asian nation to have ratified the Convention.

4.2 Inadequate Infrastructure

Inadequate water infrastructure has created sanitation, hygiene, and health problems. Since independence, the government of Uzbekistan has struggled to cover the maintenance and operation costs of water infrastructure which were once

the responsibility of Moscow, despite making water security in both urban and rural areas a political priority (ADB, 2002; 2004). The water infrastructure was poorly designed, years of deferred maintenance mean that large volumes of water are wasted, and many areas are not supplied with water at all. In rural areas, only 65% of households have a reliable water supply, with this figure falling to 30% in some districts (ADB, 2002; 2006). Conditions in urban areas are better, but still 30% of households lack water supply (ADB, 2004). As a result, many households must make do with contaminated water which must be fetched manually, often from long distances at great inconvenience and loss of time (ADB, 2004). Water tariffs are low, but although this protects the poor households who do have access to water, this low income for the state exacerbates the funding shortfall that is causing

the overall problem. The sewage and sanitation infrastructure is also decaying or absent, with very serious health implications (ADB, 2004). These water and sanitation problems have contributed to the high incidence of waterborne diseases in rural areas. These include hepatitis A, typhoid fever, and kidney problems (ADB, 2004). These health problems, as well as those described later, place an extra burden of health-care costs on individuals who are likely to be already poor (ADB, 2004). Poor infrastructure has also caused environmental damage, and through this, social problems, as described below.

5 Environmental causes of Water-related Social Problems

5.1 Damage to Ecology, Hydrology, and Soils

The environmental damage resulting from water misuse has caused health, economic, and quality of life problems for many people. Overuse of Uzbek surface water for irrigation and the poor state of the existing infrastructure has reduced the output volume of rivers, and altered water tables, estuaries and floodplains. Irrigation systems are commonly unlined and uncovered, allowing rampant water loss from evaporation and seepage (Small *et al.*, 2001). This in turn alters ecosystems and reduces the economic, cultural, and amenity value of these regions. The destruction of natural resources has destroyed industries like fishing and trapping that depend on those resources for sustainable yield (UNEP, 2005). Although these issues are most dramatic in the downstream reaches of the water basin, they are also causing social problems, such as lost livelihoods and social disruption in upstream areas. As investment in irrigation infrastructure and soil management has decreased, overirrigation has also created problems with waterlogging and soil salinisation, as well as unintended ecosystem change in unmanaged lands (UNEP, 2005). This reduces agricultural production, which causes economic losses and increases poverty (UNEP, 2005).

5.2 Pollution

Pollution is a severe problem with serious social impacts. Agricultural chemicals are massively overused in Uzbekistan, and much of the drainage effluent from fields, along with sewage and industrial wastes, is returned directly to waterways. These return waters are used for drinking, washing, and further irrigation. The proportion of total water volume that consists of these return waters increases as one moves downstream, but pollution problems are also serious in most upstream areas. For instance, concentrations of phenols are greater than the maximum allowable concentration for almost the entire length of the Amudarya. As of 2005, up to 66% of irrigated fields were polluted. Some chemical concentrations exceeded standards twenty or forty-fold. Pollution has reached such a high level that it is affecting the oxidative properties of the environment, to the extent that infrastructure is corroded and destroyed more quickly than usual (UNEP, 2005). Groundwater is also contaminated, with up to 3.5 grams of total dissolved salts per litre. The WHO's international standard is 1 g TDS/L (Small *et al.*, 2001). This general water pollution has caused health problems throughout Uzbekistan. These include diseases of the central nervous system, thyroid, immune system, blood, cardiovascular system, and digestive tract, as well as cancer and infectious diseases. Declining water quality and quantity is one of the main causes of increases in ill-health in the region (UNEP, 2005), despite increased government spending on health (ADB, 2004). However, it should be noted that despite these problems, health conditions in Uzbekistan are still relatively good (UNEP, 2005).

5.3 The Aral Sea Disaster

The degradation of the Aral Sea is perhaps the most serious environmental problem in Uzbekistan, and definitely the most visible. The Aral Sea, fed by the Amudarya and Syrdarya rivers, was once the fourth largest inland sea in the world. It sustainably supported a thriving fishing industry and small scale agriculture until the 1900s, when a shift to cotton and rice cultivation was encouraged by Tsarist Russia (Glazovsky, 1995). This policy

was continued by the Soviet Union. Large scale irrigation schemes drained water from the rivers feeding the Aral Sea, reducing sea volume, while excessive use of pesticides and other agricultural chemicals contaminated the rivers, ground water, and increasingly the Aral Sea itself (UNEP, 2005). Despite increased glacial melting in the mountains, which ought to have swelled the Sea, it has been shrinking steadily from the 1960s. Today it is a fraction of its former volume and has divided into two brackish lakes, the Little Aral Sea which lies in Kazakhstan and the Large Aral Sea which is mostly in Uzbekistan. This environmental catastrophe has caused economic losses, social disruption and health problems.

Uzbekistan's Aral Sea coastal areas were once home to a robust fishing industry, thriving coastal towns, and other industries. These livelihoods have been seriously impacted by the degradation of the Aral Sea. By the 1980's, the fishery had collapsed (Whish-Wilson, 2002) and approximately 60,000 people employed in the fishing industry lost their livelihoods (Ataniyazova, 2003; Carius *et al.*, 2003). Agriculture and pastoralism have been negatively affected by alterations in the water table, local hydrology, salinisation, pollution, more extreme summer and winter temperatures, and storms of toxic dust. Other minor industries such as fur hunting have been curtailed by the negative changes in wetlands and lakes. The severe shortage of freshwater has impacted any industry which requires water, severely limiting economic activity on the coastal zone of the Aral Sea (UNEP, 2005).

The destruction of the Aral Sea has caused serious social disruption. Much of the population suffers from severe stress (Small *et al.*, 2001) and an estimated 10,000 people have been forced to leave the region (UNEP, 2005). Social services and support systems, including health care, have been disrupted (Small *et al.*, 2001).

Social disruption, inadequate sanitation, contaminated water, and atmospheric pollution have caused myriad health problems. There is a severe shortage of freshwater, which has led to problems with sanitation and has allowed

preventable, treatable diseases such as tuberculosis, dysentery, and respiratory illnesses to become more common, although the general state of health is still fairly good (Small *et al.*, 2001; Ataniyazova, 2003). In Samarkand oblast, a region of Uzbekistan, disease incidence has increased threefold (UNEP, 2005). Most water is heavily contaminated with agricultural chemicals and bacteria, and does not reach international drinking water standards but is the only option for local people (UNEP, 2005). Toxic dust is an additional problem. As the chemical-laden Aral Sea dried up, it left behind its salts and contaminants in the dry desert soil. The arid situation and the pollutants themselves have prevented vegetation from colonising the area, so the bare soil is easily eroded by wind. 43 million tonnes of dust are lifted by the wind each year (Small *et al.*, 2001). This windblown dust includes the salts and poisons, creating an inhalable hazard. These contaminants may be to blame for in the increase of anaemia, cancer, circulatory diseases, thyroid problems, and kidney and liver diseases (UNEP, 2005; Ataniyazova, 2003).

6 Economic Causes of Water-Related Social Problems

As the main crop of Uzbekistan, and the most water hungry, cotton is a key part of the water-related social issues in the area. The cotton industry uses around 90% of the nation's total water budget (UNEP, 2005), contributing to the problems of water shortage, waterlogging, and soil salinisation. The industry is still centrally controlled, with mandatory production targets and an artificially low state procurement price (Wegerich, 2000; Guadagni *et al.*, 2005). The state then sells the cotton on to the world market at a much higher price (Guadagni *et al.*, 2005). Production costs have increased while subsidies have fallen, leaving many farmers with economic losses (Kandiyoti, 2003). Shifting to other crops is difficult, as farmers often have to allocate a certain percentage of their land to cotton (Wegerich, 2000).

The methods used in cotton cultivation have negative social impacts as well. Due to a shortage of machinery, cotton is usually planted and harvested

by hand (Jarvik, 2005). Harvesting is mostly done by women (Kandiyoti, 2003), but children and other forced labour such as trafficked men are used as well, despite the 2001 government decree that prohibits those under age 18 from engaging in manual cotton harvesting (U.S. Department of State, 2007). Labourers are poorly paid and working conditions are unhealthy, as workers often inhale harmful chemical and pesticides sprayed on the fields (U.S. Department of State, 2007).

7 Future Directions

It is clear that the misuse of water has caused serious social problems in Uzbekistan. The water problems facing Central Asia are formidable, but the region—crucially—does not suffer from a serious and absolute shortage of water. If water were managed better, it would be possible to alleviate many of the current water problems and possibly even to expand agricultural production. What is being done to improve the situation?

7.1 Improved International Cooperation

Despite its problems, the ICWC has a well-stated mission which, if implemented more vigorously, would be effective in improving interstate water cooperation. This existing framework means that improving cooperation is a matter of enforcing existing legislation and encouraging existing efforts, rather than creating an entirely new system with all the attendant logistical difficulties this entails.

There is also potential to improve bilateral agreements between nations. In 1995, Uzbekistan and Kyrgyzstan along with Kazakhstan formalised their fuel-for-water arrangements whereby Kyrgyzstan supplies summer water and hydropower in exchange for winter fuel. The water and energy schedules are administered according to a framework created by the Executive Committee of the Interstate Council of the Central Asian Economic Community, which encourages integration and development in the area (McKinney, 2003).

7.2 Internal Reforms

Within Uzbekistan, attempts are also being made to reform the fundamental structure of the system, since it is the system itself—rather than ignorance, superstition, or non-compliance with laws—that is causing most of the problems. Although privatisation has happened slowly, and meaningful reforms even more slowly, the loosening of state control is allowing individual farmers and small groups more freedom to decide their own affairs. In 2000, the centrally controlled irrigation systems were turned over to farmers and regional Water User Associations (WUA's) were formed (Zavgorodnyaya, 2002). The WUA's in Uzbekistan were envisioned as managers of the irrigation system, which was previously the responsibility of the large state farms. The WUA's inherited a decayed water infrastructure and are not always entirely fair to every stakeholder (Wegerich, 2000), but despite these problems, members consider WUA's well structured and effective (Zavgorodnyaya, 2002) and they have helped farmers to share water more effectively. They also help bridge the gap between the organisations that make water decisions (such as ICWC) and water users on the ground (Elhance, 1997). Practical issues are met with enthusiasm and farmers feel responsible for their land and the irrigation system, despite serious disenfranchisement.

In terms of the cotton industry and its abuses, Uzbekistan is making efforts to curb human trafficking and child labour. The ILO Conventions on minimum age of employment and elimination of child labour were adopted in 2008, along with a new, comprehensive antitrafficking law that improves support for victims and coordinates efforts between government ministries (Embassy of the United States in Tashkent, 2008). However, the government is unwilling to make meaningful efforts towards allowing farmers more control or loosening controls on cotton trade.

7.3 Practical Water Management Improvements

In Uzbekistan, there are many international and domestic projects aimed at providing specific practical support or to correct technical issues. The Western Uzbekistan Rural Water Supply Project, for instance, improved water and sanitation services in drought hit-areas of Karakalpakstan and Korezm (ADB, 2002). The Drainage, Irrigation, and Wetland Improvement project is increasing the productivity of agricultural land and reducing poverty in Karakalpakstan through improved irrigation and reducing pollution through safe disposal of drainage effluent (World Bank, 2003). The urban poor have also benefited from a project which improved water infrastructure in apartment blocks, thus reducing costs and water waste (ADB, 2006). The ICWC runs educational seminars for farmers to improve agricultural practice (ICWC, 2008). Well-designed technical projects offer exciting opportunities not only to solve pressing practical problems, but to build trust and to reform institutions from the inside out. For instance, the US \$ 25 million Kashkadarya and Navoi Rural Water Supply and Sanitation Sector Project aims to improve sanitation and water supply in two poor rural districts while also building institutional cooperation through training and active involvement policies, and to improve the position of women through selective hiring practices and planning procedures (ADB, 2004). Uzbekistan has a well-educated population and local technical ability even in rural areas is not lacking (ADB, 2004) which helps to move these projects forward.

8 Conclusion

The mismanagement of water in Uzbekistan has led to serious social problems. These problems emanate from environmental, social, and economic causes. Widespread pollution has caused ill health and increased costs to the poor, as has the decaying infrastructure. Ecological damage, with associated lost or damaged livelihoods, has resulted from pollution, water shortage, and overirrigation. Conflict over water resources and poor international cooperation have caused water shortages, floods, and internal tensions. Poverty has resulted from many of these previous issues, and the cotton industry itself creates many environmental problems, as well as being structured in a way that causes abusive practices.

Amelioration of many of these problems is possible, given better water management. Practical measures show great promise for reducing poverty, improving water supply and management, and reclaiming degraded lands. The government of Uzbekistan is working to improve cooperation with other states over regional water sharing. The people of Uzbekistan, despite their problems, are well educated and willing to work towards tackling these issues. It is to be hoped that Uzbekistan can shed its reputation as a parable of the consequences of bad water management, to become an example of the possibilities of restoration and renewal.

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PASSING OVER THE CONFLICT. THE CHU TALAS BASIN AGREEMENT AS A MODEL FOR CENTRAL ASIA?

Kai Wegerich

Wageningen University, The Netherlands

The international community celebrated the Chu Talas basin agreement as a major breakthrough for water management in Central Asia where, until recently, the potential for conflict over water resources was rated as very high. The agreement is presented internationally as a model for Central Asia. It is argued that the lessons learned from this case could be transferred to the larger Central Asian rivers. Here, it is attempted to give an historical account on water sharing in the Talas basin, on other Central Asian water agreements, and on the foci of the international community (SPECA). Furthermore, the paper questions whether the knowledge gained from this basin can or even should be utilized for other Central Asian rivers.

1 Introduction

Although Smith (1995: 351), focusing on water sharing, was writing in the mid 1990s that “nowhere in the world is the potential for conflict over the resources as strong as in Central Asia”,

a recent publication, based on a NATO-sponsored advanced research workshop (20-22 June 2006 in Almaty, Kazakhstan), is called “Transboundary water resources: a foundation for regional stability in Central Asia” (Moerlins *et al.*, 2008). Hence, the impression is given that, after nearly ten years of stagnation and conflict potential over water resources in Central Asia, a new era of cooperation has emerged. The success story promoted for Central Asian water cooperation involves the Chu and Talas basin and the 2000 agreement between the riparian states, Kazakhstan and Kyrgyzstan. Under the agreement, Kazakhstan and Kyrgyzstan

Corresponding author:

Kai Wegerich

Irrigation and Water Engineering Group,

Wageningen University

Droevendaalsesteeg 3a, 6708 PB Wageningen,

The Netherlands

Phone: +31 317 482750; Fax: +31 317 419000

e-mail: wegerich@yahoo.com; kai.wegerich@wur.nl

agreed to share the operation and maintenance costs of the transboundary infrastructure. “The Parties assume an individual share in compensation of operation and maintenance costs on water distribution facilities of interstate use and other co-ordinated activities proportionally to received water amount” (Article 4). After the agreement was ratified by Kazakhstan in 2002, the international organizations started to support the operationalization of the agreement – the establishment of a joint commission. “To ensure safe and reliable operation of water distribution facilities of interstate use the Parties will establish permanent functioning commissions to arrange work regime and determine necessary amount of costs on their operation and technical service” (Article 5).

Until its promotion as a success story, the Chu-Talas basin received hardly any attention in the international literature. An exception was the US Agency for International Development (USAID) report by Hutchens (1999) on cost sharing for the operation and maintenance of transboundary infrastructure in different basins in Central Asia. It was only in the early 2000s that the Chu-Talas basin appeared in the academic literature. Sievers (2002) mentions the 2000 agreement on the Chu-Talas between Kazakhstan and Kyrgyzstan, shortly after its ratification in 2002. Since then, this agreement and the Chu-Talas basin have received more attention, especially from the international community – the UN Special Program for the Economies of Central Asia (SPECAs), the Organization for Security and Co-operation in Europe (OSCE) (Nordstrom, 2007), the Asian Development Bank (ADB) (ADB, 2006) - which started to celebrate the agreement as a breakthrough, or ground breaking, for Central Asia. The Chu-Talas basin agreement was even internationally presented and promoted as a model for cooperation in Central Asia (UNESCO – PCCP, 2004a; SIWI, 2007). With the international agencies involved, the internationally shared knowledge about the Chu-Talas basin increased (Demydenko, 2004; Krutov and Spoor, 2006; Rodina *et al.*, 2008; Bure, 2008). In this literature, reference is often made to the pre-existing good relations and informal networks that led to the

agreement on cost sharing. Here, it is attempted to give an historical account on water sharing in the Talas basin, on other Central Asian water agreements, and on the foci of the international community (SPECAs).

The chapter is based on a literature review of conference papers together with information available on the newly established Chu-Talas web page (Transboundary Chu-Talas River project, 2007a, 2007b) and on web pages of the international community, mainly the UNESCO web page – from Potential Conflict to Co-operation Potential (PCCP) (UNESCO – PCCP, 2004b, 2004c)1. Fieldwork was carried out in the Talas basin in July and August 2007. Interviews were conducted with staff of the Chu-Talas Basseinovoye Vodnoye Obyedineniye (BVO: Basin Water Organization), the Dzhambul Province Public Water Management Enterprises (RGP), managers from the Kyrgyz Kirov reservoir and other local water experts in Almaty and Dzhambul Provinces.

The remainder of the chapter is structured as follows. The next section presents briefly the concept of discourse and how success stories are created. This is followed by a geographical description of the Talas basin. The fourth, fifth and sixth sections focus on the international level within Central Asia as well as the operation of the Kirov reservoir, by interpreting the data from the Pekrovka metering station during the Soviet Union era, in the 1990s, and from 2000 onwards. The seventh section summarizes and concludes.

2 Controlling the discourse

Hajer (1997) shows how policy discourses frame certain problems, distinguishing some aspects of a situation rather than others. In their research on water politics, Zeitoun and Warner (2006: 448) identify knowledge construction and sanctioning the discourse as hegemonic compliance-producing mechanisms. They argue that these two mechanisms “in the world of water conflicts may serve to veil certain aspects of riparian relations while emphasizing others”. Their focus is on river basins and how riparian states claim water shares;

nevertheless, they (2006: 450) identify the role of international agencies, stating: “donor and bank funding is not necessarily neutral or equitably distributed”. They support their claim by quoting Waterbury (2002) who links staffing and financial contributions of states with the international interventions.

However, agency interventions have to show results. Mosse (2004: 646), evaluating critically a development project in India, argues that it is “not whether a project succeeds, but how success is produced”. Rap (2006: 1301) starts his paper on the policy model of irrigation management transfer in Mexico by paraphrasing a George W. Bush statement (interview with Associated Press, 18 January 2001) stating: “to succeed, you need to demonstrate success and dissociate yourself from failure”. Mosse (2004: 646) reasons that “success in development depends upon the stabilization of a particular interpretation”. Hence, control over the interpretation of certain developments is important. The more often the interpretations are restated and adopted by different authoritative sources, the more stable they become.

3 Geographical background of the Talas basin

The basin commonly referred to as Chu-Talas is formed mainly on the Kyrgyz ridge. It consists of

three main rivers, the Asa, the Chu and the Talas, which are formed by the confluence of many small rivers. Here the focus is on the Talas river only (Figure 1). The Talas river is formed by the confluence of the Karakol and Uchkosha rivers within Kyrgyzstan and vanishes in Moinkum sands in the territory of Kazakhstan. In total, the river is 661 km long and its watershed is 52,700 km², of which 22 percent is in Kyrgyzstan and 78 percent in Kazakhstan. The flow of the river is formed by seasonal snowmelt and partially by glaciers from the Kyrgyz mountains. Krutov and Spoor (2006: 4) state that “about 80 percent” of the flow is formed in Kyrgyzstan. The total water resource in the basin is estimated at 1.5 km³.

Demydenko (2004: slide 33) states that “The average elevation of the river’s watershed area varies from 2,500 to 2,700 m above sea level. The climate of the Talas River basin is continental with winter period precipitations varying between 400-500 mm”. Krutov and Spoor (2006: 5) argue that “the considerably warm spring and summer from May to September practically do not contribute to the river flow”. On the other hand, available data from the Talas metering station in Kyrgyzstan indicate that precipitation during the spring months could contribute to the river flow. See Table 1 for average temperature, and Table 2 for precipitation statistics, Talas metering station.



Figure 1: The Talas river. Source: UNESCO – PCCP (2004b); Demydenko (2004)

The Talas river is dominated by the Kirov reservoir, which is the only transboundary reservoir in the basin. The reservoir is situated on Kyrgyz territory, close to the border with Kazakhstan. The reservoir was commissioned in 1973, completed in 1975, and started operation in 1976. Its design capacity is 0.55 km³. The main purpose of the reservoir was to control the flow of the Talas river for the irrigated agriculture areas mainly in the downstream Kazakh territory (Demydenko, 2004). Krutov and Spoor (2006: 7) explain further: “it has been used to regulate flows to the downstream areas, to provide additional water during the early and late parts of the vegetation period (April-May, August-September)”. Currently, within the Talas basin, there are 114,900 hectares of irrigated land in Kyrgyzstan and 79,300 hectares in Kazakhstan. Demydenko (2004: slide 40) states: “in earlier times, the total irrigated land in the Kazakh part of the basin was almost equal to the irrigated area in the Kyrgyz part”. In Kazakhstan the irrigated areas are close to the Kyrgyz border; here the width of the valley is twenty-five to thirty kilometres; after an artificial lake (approximately sixty kilometres North of Taraz city, capital of Dzhambul Province)

the width of the valley reduces to only one to two kilometres (Figure 2).

To date, no historical account has been provided on joint cooperation or the reasons which triggered the agreement. The following sections structure the events according to the decades 1980s, 1990s and 2000s.

4 Water management in the 1980s

4.1 Water management within Central Asia

Within the basin framework, most dams and reservoirs were built upstream in the mountains of Kyrgyzstan and Tajikistan, whereas the irrigation areas were downstream in the valleys and in the steppes. The water-management constructions were built to facilitate irrigated agriculture in the downstream regions. This reasoning is appropriate for the Toktogul dam located in the Syr Darya basin and for the Kirov in the Talas basin, both in upstream Kyrgyzstan, but it cannot be applied to the Nurek dam in Tajikistan (Wegerich *et al.*, 2007). In order to use the dams for agricultural purposes, water had to be released in the vegetation season to satisfy irrigation demands.

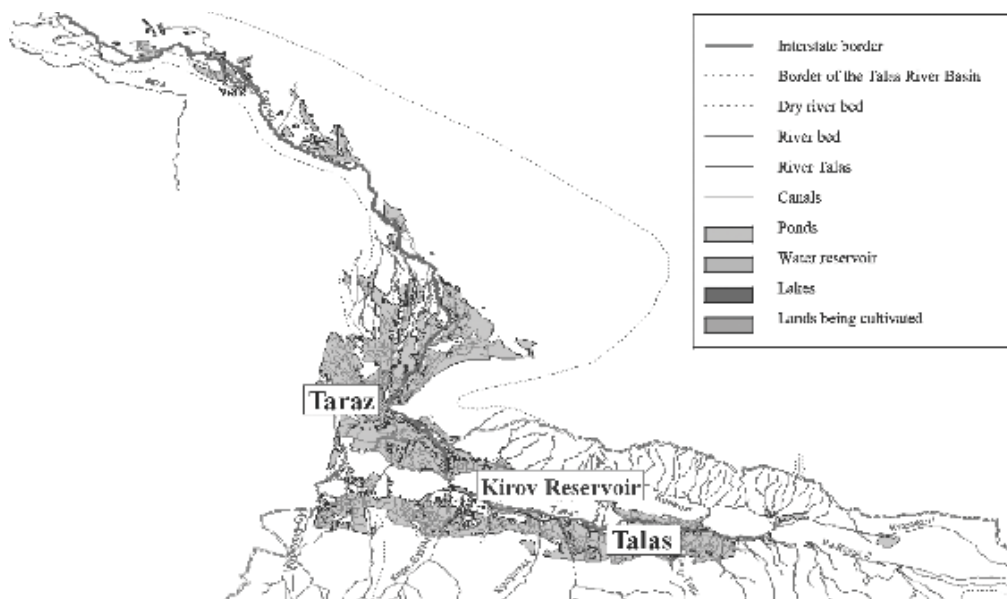


Figure 2: Talas river, its tributaries and irrigated area. Source: adapted from Demydenko (2004)

Table 1: Average temperature at Talas metering station (1999-2007). Source: <http://meteo.infospace.ru>

	1999	2000	2001	2002	2003	2004	2005	2006	2007
January	-6.1	-1.2	-6.6	-2.5	-2.2	-2.3	-4.5	-7.2	-2.6
February	-3.0	-2.1	-2.2	-1.5	-1.6	0.7	-5.9	1.7	0.4
March	-3.5	3.3	5.4	5.4	2.1	1.5	7.1	6.5	3.0
April	9.2	12.7	10.6	8.4	6.7	6.1	10.7	11.6	13.2
May	16.0	16.3	17.9	13.5	13.1	11.9	14.2	16.1	15.6
June	17.3	19.6	22.0	18.5	18.7	17.9	20.5	19.3	20.5
July	19.4	21.7	20.6	20.9	20.8	20.4	22.2	19.9	21.3
August	21.4	21.0	19.8	21.5	20.4	19.3	18.5	20.2	20.0
September	15.9	15.4	14.1	15.9	15.7	15.3	16.8	14.6	16.0
October	11.1	6.0	7.6	11.5	10.0	8.2	10.6	11.7	7.3
November	2.4	0.5	4.3	4.3	2.4	5.9	3.4	3.7	5.3
December	0.7	-0.7	-3.7	-6.4	-1.8	-2.0	-1.3	-3.4	-5.3

Table 2: Precipitation at Talas metering station (1999-2004). Source: <http://meteo.infospace.ru>

	1999	2000	2001	2002	2003	2004
January			39.6	46.0	40.9	27.2
February			48.0	56.4	53.3	11.2
March		7.1	43.2	67.4	80.5	57.0
April		41.8	58.8	121.7	84.6	38.5
May		37.7	42.4	113.4	86.3	35.1
June		26.3	21.0	62.3	79.4	5.3
July		9.9	54.1	46.4	58.3	
August		1.5	55.3	24.1	44.5	
September		2.7	23.3	14.3	26.3	
October		57.1	112.3	34.8	48.3	
November		40.7	39.7	23.6	67.6	
December		18.3	47.9	73.9	21.3	
Total		243.1	585.6	684.3	691.3	174.3

4.2 Water management within the Talas basin

During the Soviet era, the Kyrgyz SSR and the Kazakh SSR signed an agreement on water sharing in the Talas basin in Moscow on January 31, 1983. Under the agreement it was decided to share the flow within the Talas basin equally – 50 percent to each republic. The 1983 protocol assumes a mean annual flow of 1616 million m³ in the Talas basin.

Kazakhstan's share has two components. The main component is the discharge from the Kirov reservoir of 716 million m³, the remaining 92 million m³ are formed within Kazakhstan's own territory. The agreement determines that Kazakhstan should receive 579.6 million m³ from the Kirov reservoir (measured at the Pekrovka metering station) in the vegetation period (April to September) and in the non-vegetation period (October to March), an amount of 136.4 million m³. The Pekrovka

metering station is just upstream from the republic boundary, on Kyrgyz' territory. (Figure 3). Since at the time both countries were unified within the Soviet Union, both received their funding from the Ministry of Water Resources. Kemelova and Zhalkubaev (2003: 480), writing on transboundary water issues in the Syr Darya basin, state that "the USSR budget contributed roughly US\$600 million to Kyrgyzstan's budget annually". Therefore, the 1983 protocol makes no reference to the operation and maintenance costs of the reservoir.

It is questionable how the 1983 protocol was implemented during the Soviet Union. Demydenko (2004: slide 48) shows a graph with planned and

actual releases from the Kirov reservoir for the year 1986. According to him, even during the Soviet Union, Kyrgyzstan delivered less water than the requested distribution. However, it is not evident to what the term requested distribution in his presentation refers, whether it relates to the protocol or to an irrigation plan for Dzhambul Province for a particular year. In addition, one has to question whether the flow for the year 1986 is representative for the Soviet Union period after 1983.

Data provided directly by the Chu-Talas BVO (Kazakhstan) for the Pekrovka metering station show that, at least in the two years (1987 and 1988) for which figures were made available, more water

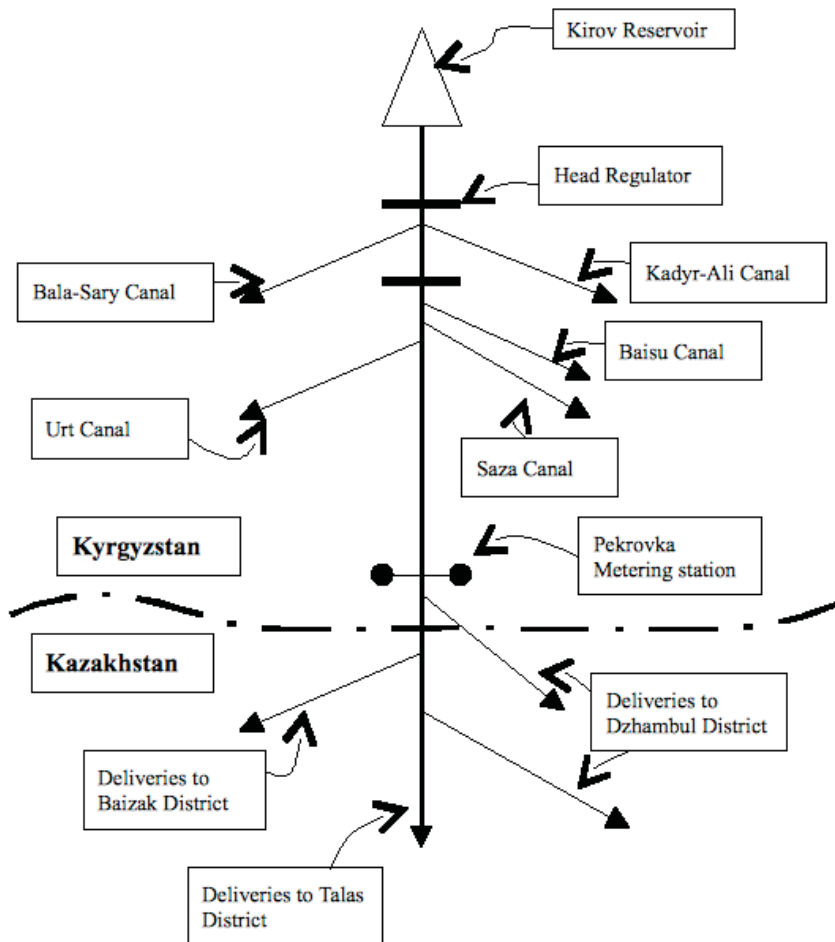


Figure 3: Simplified schematic of Talas river system. Source: adapted from Hutchens (1999)

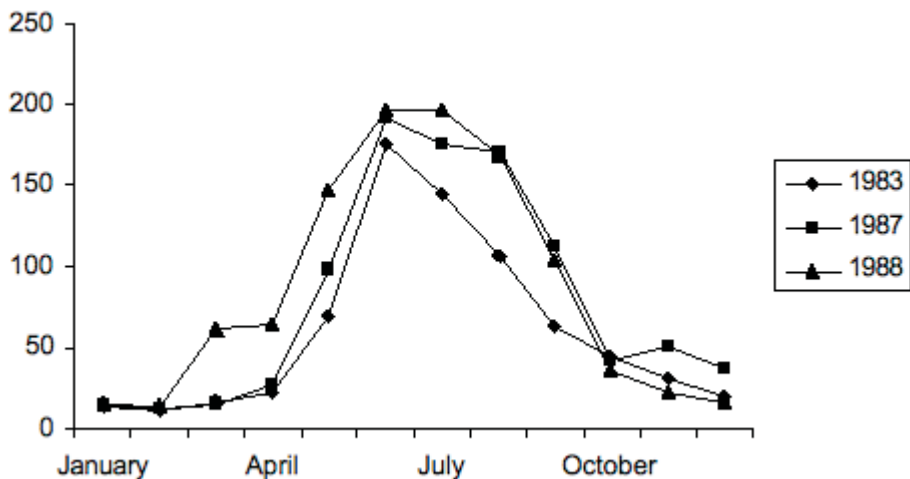


Figure 4: Data mentioned in Annex to the 1983 agreement and data from the Pekrovka metering station for the years 1987 and 1988 (million m³). Source: Dzhambul Irrigation Department

reached Pekrovka during the vegetation period than the mean annual flow officially stated in the protocol (total during the vegetation period of 776.4m. m³ and 876.6m. m³ for 1987 and 1988, respectively). Therefore, it appears that during the time of the Soviet Union Kyrgyzstan released additional water to support irrigated agriculture in downstream Kazakhstan.

5 Water management in the 1990s

5.1 Water management within Central Asia

After independence, the basin was divided between two independent countries, and therefore the basin water management framework could have been at risk. Nevertheless, shortly after independence in 1991, the governments of the newly independent Central Asian states agreed to continue with the principles of water allocation that had prevailed in the USSR. The Almaty Agreement, signed in February 1992 by representatives of Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan, acknowledged joint management of water resources. “Under the agreement the states retained their Soviet-period water allocations, refrained from project infringements on other states

and promised an open exchange of information” (O’Hara, quoted in Horsman, 2001: 73).

Instead of disputes arising in relation to water allocations, problems arose between the riparian states on transboundary water-provision infrastructure. Within the Amu Darya basin, transboundary water-provision infrastructures are the pump stations located in Turkmenistan and providing water to Uzbekistan, and the Tuyamuyun reservoir located in Turkmenistan and providing water to Turkmenistan and Uzbekistan. In April 1996, Uzbekistan and Turkmenistan came to a bilateral agreement. According to this agreement, Uzbekistan pays to Turkmenistan US\$ 11.4 million annually as land rent for the Bukhara and Kashkardarya pump stations and for the water storage area of Tuyamuyun and in addition covers all the operation and maintenance costs (which include visas for maintenance personal and transport) (Wegerich, 2006).

Within the Syr Darya basin, tension between upstream and downstream riparian states arose not in relation to water allocation, but in relation to the shift from operating the Toktogul reservoir for downstream irrigation in the summer months to winter releases in order to increase the availability

of energy upstream (hydropower). The use of water for energy production did not change the regional allocation of water, only the timing of releases. In addition, Kyrgyzstan began to demand payment from the downstream riparian states (Kazakhstan and Uzbekistan) for the use of water from its reservoirs. Pressure from USAID resulted in the establishment of a barter agreement (Lange, 2001; Weinthal, 2001). On 17 March 1998, the governments of Kazakhstan, Kyrgyzstan and Uzbekistan adopted an interstate agreement on use of water and energy resources of the Syr Darya river basin.

Following this agreement, SPECA was launched in 1998. Its goal was to strengthen sub-regional cooperation in Central Asia. The Project Working Group (PWG-Energo) was established as an instrument for the implementation of SPECA (PWG-Energo reports). Its priority program is cooperation on “rational and efficient use of energy and water resources of the economies of Central Asia”. The focus on energy and water already suggests that the main focus could be on the Syr Darya basin. It should be emphasized that, even though Afghanistan is mentioned as a member of SPECA, it is not mentioned in any of the PWG-Energo meeting reports. The meeting reports show that Kyrgyzstan played a major role in this initiative. Kyrgyzstan not only hosted the meetings, but also early on in the meetings main speeches were given by high Kyrgyz politicians. From the start, the initiative has been ignored by Uzbekistan. Even during the first meeting (20-21 November 1998 in Bishkek), Uzbekistan was only represented by the plenipotentiary representative of Uzbekistan in the Executive Council of the Inter-State Council of the Economic Union of Central Asia. At the second meeting (Bishkek: 8-9 July 1999), neither Turkmenistan nor Uzbekistan was present. As these downstream states were absent from the meeting, the agenda that was set was dictated by upstream interests:

Rational and efficient use of energy and water resources of the economies of Central Asia can and should be assured through establishing treaty-based relations based on equitable and

reasonable sharing. They should provide for mutual compensation of the participating countries for the services for regulating water regimes and for the maintenance of water management and hydro-technical constructions in the basins of the rivers Naryn – Syr Daria and Amu Daria. (Meeting report)

However, at the second meeting, it was realized that comprehensive consideration “was possible only when all countries of the region participate in the discussion and decision-making”. Having set the agenda, “the session requests the Chair to duly inform Turkmenistan and Uzbekistan of the work of the PWG Energo and to make special efforts to invite the delegation of those participating SPECA countries to take part in the next session”. Nevertheless, at the third session (Bishkek: 18-19 November 1999), representatives of Turkmenistan and Uzbekistan did not take part.

5.2 Water management within the Talas basin

According to Krutov and Spoor (2006: 8), “both countries [Kazakhstan and Kyrgyzstan], after independence, continued to recognize the [water-sharing] method and agreed to follow it”. The data recorded at the Pekrovka metering station should give evidence as to whether this was the case. To date, it seems that only Hutchens (1999) provides data for the Pekrovka metering station for consecutive years during the 1990s (Table 3). He gives the Dzhambul Irrigation Department in Kazakhstan as the source of his data.

According to Hutchens’ data, it appears that Kyrgyzstan supplied to Kazakhstan in 1997 and in 1998 less water during the vegetation season than the amount (579.6 million m³) agreed in the 1983 protocol. Hutchens’ data (1999: 71) suggest that the year 1997 was a dry year, and this may have been the reason for the low water supply to Kazakhstan. However, the data for 1998 show high off-season water supply (after the irrigation period) to Kazakhstan. It is not evident whether there was high precipitation during that period, (according to Demydenko, 2004, or Krutov and Spoor, 2006,

this would be unlikely) or whether the water was kept within the Kirov reservoir during the irrigation season.

As a representation of the 1990s, Demydenko (2004: slide 48) presents the actual water releases from the Kirov reservoir for the year 1994. According to his data, the releases were above the requested distribution. It would appear, therefore, that Kyrgyzstan over-fulfilled its side of the contract. Given Hutchens' data, however, it seems that the year 1994 is not representative. This is also underlined by the reasoning of Demydenko himself. He (2004: slide 40) argues that the irrigated area decreased on the Kazakh side after independence "due to the limited water availability".

As in Hutchens' study, data for the Pekrovka metering station for the 1990s were collected from the Dzhabul Irrigation Department for this present research. Only the data for the years 1992-1999 were made available and are presented in Figure 5. Even though the data are from the same source, the Dzhabul Irrigation Department, the data do not correspond to the data presented by Hutchens. The collected data suggest that during the 1990s Kazakhstan always received more than the annual 716m³ agreed in 1983. An analysis of the breakdown between the vegetation and non-vegetation period reveals that Kazakhstan received more water during the vegetation period than agreed, but the amount only once – in 1994 – exceeded that supplied to Kazakhstan in the two years, 1987 and 1988, detailed in Figure 4. Thus the year 1994 presented by Demydenko appears to

be non-representative. During 1994, a total flow of 1,257.52m³ was recorded at the Pekrovka metering station, of which 362.18m³ during the non-vegetation and 895.34m³ during the vegetation period. Because of the high flow (flood events) in 1994, one could interpret the releases during the non-vegetation period as emergency releases.

Similar to 1994, in three other years (1995, 1998, and 1999) 80m to almost 100m³ were released above the non-vegetation period limit of 136.4m³ determined in the protocol. Compared to the total flow for the year 1988 (1,041.5m³), these years do not seem to have exceptionally high flow (floods), therefore they would not justify emergency releases and the water could have been saved for the vegetation period (1995 and 1999) or for the next year (1998).

On closer inspection within one period, the data suggest that whereas during the Soviet Union the releases peaked during the month of June, in four years of the 1990s the peak of releases occurred in July. Therefore, one could assume that the changed schedule had a negative effect on irrigated agriculture. Overall, it appears that after independence the water supply from the Kirov reservoir was not as stable and advantageous for Kazakhstan as during the Soviet Union.

The new Chu-Talas Commission, established in 2005, emphasizes the good relationship between the two countries. They present information on Kazakh and Kyrgyz exploitation costs for water

Table 3: Hutchens (1999) data on water flow measured at the Pekrovka metering station (million m³). Source: adapted from Hutchens (1999: 71)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	NON-VEG	VEG
1995	11.3	68.2	95.0	58.8	131.8	108.3	133.2	112.9	52.9	20.8	20.5	14.7	230.5	597.9
1996	10.4	8.1	7.3	22.9	111.3	132.7	138.5	117.9	55.7	17.3	11.3	7.5	62.0	579.0
1997	7.3	5.8	6.6	18.3	116.6	118.5	126.9	86.3	25.9	15.2	10.2	5.9	45.8	492.5
1998	4.9	5.5	5.1	18.6	88.0	103.1	125.2	111.1	89.1	116.2	55.6	No data	187.3	535.1

facilities for the Talas river (Figure 6). A Mott Macdonald report (2005: Section 2.6.22) mentions annual bilateral protocols in which “the financial participation of Kazakhstan was agreed as well as the list of specific objects and types of work to be invested. During 1998-2003, actual annual input of the Kazakh party was increased from 7 to 190 thousand USD, i.e. from 3 to 71% of total sum of actual annual operational costs”. However, Hutchens (1999), who focuses on cost sharing for the operation and maintenance of transboundary infrastructure, does not mention any cost sharing for either Talas or Chu at that time.

If Kazakhstan was already contributing in 1998 to transboundary infrastructure in the Talas basin, then it seems that the cost sharing did not lead to any obvious results in terms of water releases from the Kirov reservoir.

6 Water management in the early 2000s

6.1 Water management within Central Asia

The presence of the international community in the PWG-Energo sessions increased from session to session. At the fourth session (5-6 April 2000), representatives of OSCE, Civil Aviation Planning Committee (CAPC), International Security

Assistance Force (ISAF), USAID, Agency for International Ecology Fund, TACIS, UNDP, the Swiss Coordination Office as well as the Embassy of the Russian Federation were present. Still, delegations from Turkmenistan and Uzbekistan did not attend. Only from the sixth session (22-23 June 2001) onwards did Uzbekistan send observers, and from the eleventh session (9-11 April 2003) Uzbekistan sent a delegation. At the same time, the meeting reports suggest that the speeches were less political and that the issues broadened.

Only at the ninth session (10-12 July 2002) was reference made to the Chu and Talas river basin. At this stage, it was only mentioned in an aside. “Mr. Libert also informed the participants about the course of a sub-project”, the second sub-project mentioned being the “joint use of Chu and Talas river basins by Kazakhstan and Kyrgyzstan”. At the tenth session (26-28 November 2002) there was again no mention of the Chu-Talas basin. During the eleventh session, the first meeting of the project “Support for the creation of a commission between Kazakhstan and Kyrgyzstan on the Chu and Talas rivers” took place. Four work packages were decided upon: drafting the structure and role of commission and basin councils; preparation of terms of reference on development of documents on procedures of joint finance and use of water

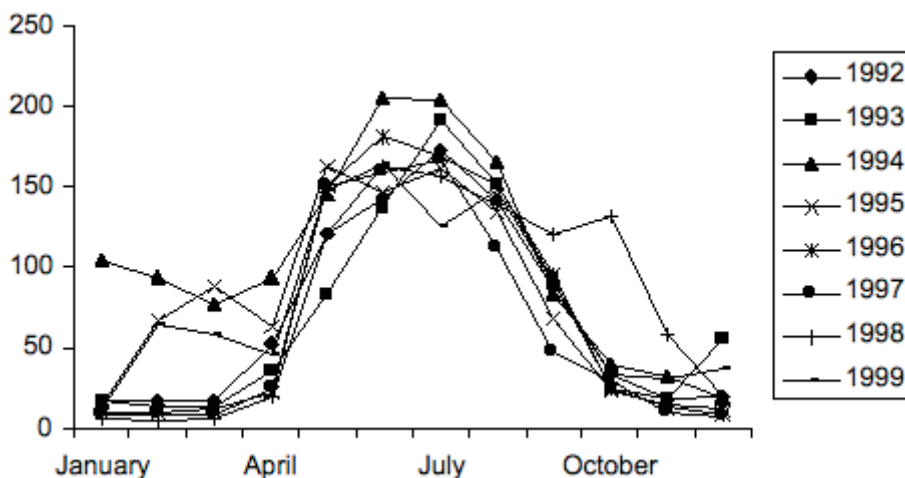


Figure 5: Water recorded at the Pekrovka metering station, 1992-1999 (million m³)

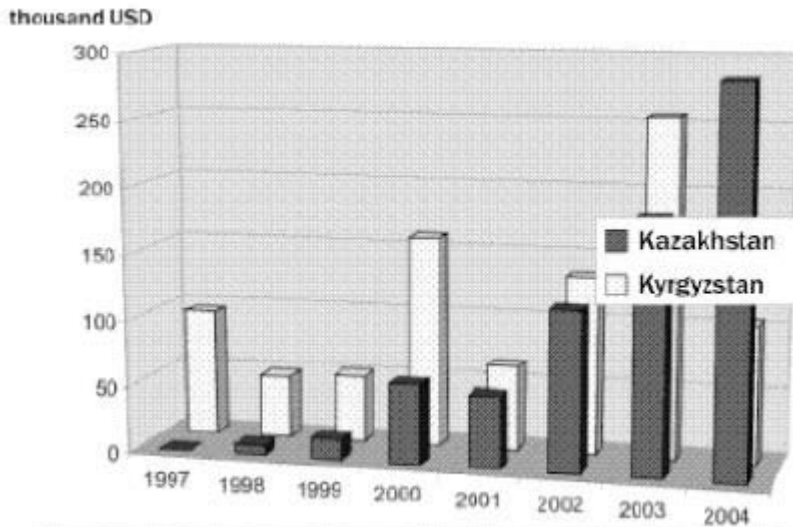


Figure 6: Exploitation costs for water facilities on the Talas river

management structures; preparing suggestions on the basic directions of the program of public participation; and making certain documents available on the Internet (Annex 1 to meeting report of the eleventh session).

It was only between 2003 and 2004, under the EU-TACIS: ASREWAM project, that a fact-finding mission studied the Chu-Talas basin (main emphasis on the Talas basin). The international consultants participating in this missions (such as to Demydenko and Krutov) were the ones who, after the mission, increased the internationally shared knowledge about the Chu-Talas basin.

6.2 Water management within the Talas basin

On 21 January 2000, Kazakhstan and Kyrgyzstan signed the agreement on cost sharing for the transboundary water infrastructure in the Chu-Talas basin. The agreement makes no reference to the two water sharing agreements signed in Moscow in 1983, but water sharing is vaguely addressed in the first Article: “The Parties agree that use of water resources, operation and maintenance of the water facilities for interstate use shall be allocated to the mutual benefit of the Parties on a fair and

reasonable basis”. In addition, the 2000 agreement makes no reference to any earlier annual bilateral protocols. The agreement states: “The Owning Party that possesses water management facilities of intergovernmental status has the right to compensation from the Utilizing Party that uses these facilities. The compensation shall cover necessary expenses to ensure their reliable and safe operation.” (Article 3) and “The Parties shall take shared part in the recovery of costs associated with the operation and maintenance of the facilities for interstate use and other agreed initiatives in proportion to the water received” (Article 4).

What are the consequences of the agreement? According to the data from the Chu-Talas Commission (Figure 6), Kazakhstan’s contribution to the transboundary infrastructure costs has increased significantly since 2000. Nevertheless, the data from the Pekrovka metering station for the years 2000 to 2006 show that the agreement did not lead to real changes compared to the 1990s (Figure 7).

One could question why the agreement was ratified by Kazakhstan in 2002. Either the non-release of additional water during the non-vegetation period in 2001 or the high water releases during the vegetation period (972.36 million m³ recorded

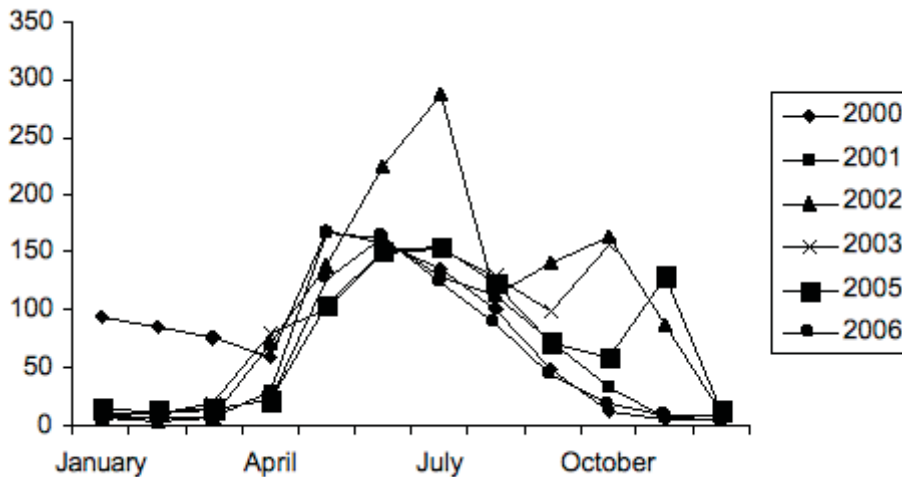


Figure 7: Water recorded at the Pekrovka metering station in the early 2000s (million m³)

at Pekrovka) in 2002 may have triggered the final ratification. In any case, the ratification of the agreement did not lead to changes either.

Whereas Demydenko (2004: slide 52) focuses on more technical issues for implementation: “problems arise in transparency, technical capability and methodological approaches used to determine water availability and therefore apportionment on an annual basis”, Valentini *et al.* (2004: 57), referring to the ratified interstate agreement, hint that there are not only technical issues: “when the document took effect and some experience was gained in its implementation, the parties considered it useful to create an intergovernmental commission for the rapid accomplishment of practical tasks”.

Even after the Chu-Talas Commission was established (on 26 July 2005), there were high off-season water releases at the Kirov reservoir (in November 2005). These high off-season water releases may have caused water shortages and even non-compliance with the agreed amount to be supplied to Kazakhstan in 2006 according to the 1981 protocol.

7 Conclusion

The data presented here, which were provided by the Dzhambul Irrigation Department (Kazakhstan), show that, with the exception of 2006, after independence Kyrgyzstan always fulfilled or even over-fulfilled its water supply obligations to Kazakhstan as determined in the 1983 agreement. However, Kyrgyzstan changed the operation of the Kirov reservoir. Water releases during the non-vegetation period became regular. Therefore Kyrgyzstan reduced the amount of water available for downstream agriculture in Kazakhstan during the vegetation period. In addition, instead of peak releases during the month of June as practiced during the Soviet Union, the peak releases varied after independence, therefore putting additional pressure on agriculture downstream in Kazakhstan.

A plausible reason for the change of operation could be that Kyrgyzstan utilized its strategic position – upstream and with the necessary water-control infrastructure – as a bargaining tool to press Kazakhstan to share the operation and maintenance costs of the Kirov dam. This tactic was also utilized for the Toktogul reservoir in the Syr Darya basin. However, whereas Toktogul reservoir is used for hydropower production, the Kirov reservoir is not.

In addition, even after Kazakhstan started paying in the late 1990s, the operation as it existed during the Soviet period was not reinstated. Neither did the agreement on sharing operation and maintenance costs signed in 2000, nor its ratification in 2002, lead to a change of operation. Therefore, it is too early to celebrate this agreement. Even the establishment of the joint commission did not lead to changes. Hence, the real success is not in basin cooperation, but rather in upstream hegemony.

Overall, the SPECA PWG-Energo meeting reports suggest that the involvement of the international community in the Chu-Talas basin was initially not anticipated. The focus of the group was clearly on the Syr Darya basin and maybe on the Amu Darya basin, not on the smaller Central Asian rivers. The focus was on energy and water resources, therefore suggesting that the focus was on reservoirs used for hydropower production, but this is not the case with the Kirov reservoir. It appears that the SPECA PWG initiative was unsuccessful considering its focus. However, it created a necessary mass of

attention within the international community – a mass that could promote the Chu-Talas sub-project, with its call to create a basin commission, as a success story. The retelling of the success story, with the focus on the future and not on the past events that have triggered the agreement, promoted the perception of good relations between Kazakhstan and Kyrgyzstan. It also highlighted the need for the international community to be involved in interstate cooperation. In addition, the SPECA PWG-Energo with its meetings in Bishkek gave Kyrgyzstan the possibility to influence the discourse on water sharing arrangements in its own favour.

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Endnote

1. The author is aware of the limitations of this data. However, to the author's knowledge there are no data available on the Talas basin in reviewed articles.

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DELIBERATIVE WATER POLICY-MAKING IN KAZAKHSTAN AND KYRGYZSTAN: FOCUS GROUPS IN THE TALAS AND CHU RIVER BASINS

Kati Kangur

King's College London, UK

The paper reflects on the experiences of applying focus groups in water management decision-making for the benefit of the Talas and Chu Transboundary River Basin Commission between Kazakhstan and Kyrgyzstan. The focus groups proved useful for getting an overview of the limits of tradeoffs participants are ready to assign for common benefit in water management. However, the paternalistic community relations impede lay water users and appointed experts consensus-finding from equal positions. The trust and credibility of existing water management institutions could be re-established by introducing social dialogue models that would offer possibilities for synthesising nominated experts' and lay perspectives for laying out common goals of water management. For ensuring the workability of this social dialogue, awareness building about stakeholders' rights, but also clarification and clear enforcement of the omitted responsibilities of existing water management institutions is needed.

1 Introduction

Environmental management decision-makers are faced with difficult choices when trying to balance the objective of sustainability and multitude of social needs (Löfstedt, 2005). It is argued that an integrated water resources management (IWRM)

approach would help to better control, accelerate the integration and make the decision process more transparent (GWP, 2003). Involving stakeholders in policy development is a way forward from the technical control towards more adaptive resource management. However, the complexities in ecological assessments, the need to balance often-contradicting user interests and power-relations complicate implementation of IWRM principles (Mostert, 1998). In patriarchal Central Asian societies, the water management decision-making still follows the command and control approach.

This paper reviews an endeavour to enrich the

Corresponding author:

Kati Kangur

PhD candidate at King's College London,

Department of Geography

Strand WC2R 2LC, London, UK

Email: Kati.Kangur@kcl.ac.uk

limited technocratic decision-making process by enhancing a dialogue between the lay water users and nominated experts. The applicability of focus groups as an alternative way for decision-making in the Talas and Chu River basins between Kyrgyzstan and Kazakhstan will be examined. The focus groups were conducted in the framework of a Kazakhstan-Kyrgyzstan-Estonian joint project "Support for the creation of a transboundary water commission on Chu and Talas Rivers between Kazakhstan and Kyrgyzstan" in 2004-2005. This project was a joint endeavour of the Water Resources Committee of the Ministry of Agriculture in Kazakhstan, the Water Management Department of the Ministry of Water Management, Agriculture and Processing Industry of the Kyrgyz Republic; the Organization for Security and Co-operation in Europe; and the Peipsi Centre for Transboundary Cooperation in Estonia. The project aimed at identifying the stakeholders' needs; determining their awareness on water resources and willingness to participate in the decision-making (see report by Kangur et. al, 2005). This paper particularly focuses on determining and assessing the societal factors facilitating or limiting the process and outcomes of the focus groups. The next section will give a brief overview about the political conditions for water management in the Talas and Chu transboundary basins.

1.1 Political culture and water management principles in Kazakhstan and Kyrgyzstan

The Aarhus Convention (2000) establishes that sustainable development stems from conditions, where authorities are subordinated to the governance procedures in the public domain. However, in Kazakhstan and Kyrgyzstan cases, popular democracy is constrained and centralised power is prevailing in most domains of life. The presidents' concern for order and stability is interpreted as political ideology to legitimise their authoritarian role (Geiss, 2008). Kazakhstan has maintained a unitary and centralised administration in which the president fully controls the appointment of regional and municipal *akims* (administrative heads). Official argument against delegating some

of the responsibilities to *akims* is that regional authorities are neither financially prepared to hold elections nor ready for the responsibility. According to the Kazakhstan Water Code (2003), the central government ensures state management of water resources through the authorized national management body, the Committee for Water Resources under the Ministry of Agriculture, and River Basin Organisations. At the regional level, *Maslikhats* (local representative bodies) and *Akimats* (executive bodies) provide implementation and control of the national water management programs. Regional State Water Management organisations provide maintenance of the state-owned water facilities. Under the UNDP Project for the National IWRM Plan (UNDP Kazakhstan, 2005), the establishment of the eight river basin councils began in June 2004.

In Kyrgyzstan, President Akaev set the country on a rapid course of democratisation in the first years of post communist rule. However, a super-presidential order was established in the mid-1990s economic crisis. Despite the constraints imposed on the political opposition, some space for civil society and liberal economy has been guaranteed. However, in the minds of many ordinary Kyrgyz people, democracy has become associated with poverty and uncertainty. The Kyrgyz State's Water and Processing Industry and activities of the Department of Water Industry (DWI) under the Ministry of Agriculture focus on the management of national water resources. The structure of DWI is multilevel with regional and district branches.

The re-distribution of large soviet collective farm lands and privatisation of the irrigation systems that were designed to support their needs has posed a great management problem for farmers who operate at the fringe of profitability. The institutionalisation of water users associations (WUA) in Kazakhstan and Kyrgyzstan, mainly promoted by international donors, is a step towards introducing grass-root representation in water management decision-making. In contrast to WUAs' initial aim of democratically elected boards accountable to its members, it has marginalised the village population, and local government structures

are dominating WUAs' decision-making instead (Sehring, 2007). Formal institutional change has failed, as the externally imposed WUA format has not fit within the existing cultural norms (Sehring, 2007; Geiss, 2008). In order to overcome WUAs' capacity issues, government support, training and guidance has been instituted for local non-governmental WUAs (Wegerich, 2008).

The transboundary context adds extra complexity to the water management issues in Central Asia. After the collapse of Soviet Union, the Talas and Chu Rivers became transboundary waters between Kazakhstan and Kyrgyzstan, and from then on the riparian countries had to agree about the use of water resources. For example, Kyrgyzstan has to pay the costs for maintenance of the water reservoirs on its territory that, in fact, mainly serve the Kazakhstan irrigation farmers interests on the other side of the border. As these waters are formed on Kyrgyzstan's territory, its people feel that their national resources are exploited outside their borders and limits of power. In order to resolve a dispute, cost-sharing mechanisms for maintaining the water facilities have been instituted on the Talas and Chu Rivers between the two countries. From 2004-2005, the focus groups were carried out to facilitate water management related stakeholders' dialogue, which would feed into the work of yet-to-be-established Kazakh and Kyrgyz Joint Commission.

2 The role of stakeholders in water management

Information sharing, consultation and involvement processes are the basis of governance (PUMA, 2001) that could help to overcome the limitations of centralised state regulation. The democratic ideal of public involvement is expected to give competent authority a formal obligation to consider the results of wider deliberation. The foundation of public participation is the creation of a forum through which to achieve discussion between different, often competing social priorities and visions about the future, and to reach a balanced consensus (Arhus Convention, 1998; Renn, 1999; Catt & Murphy, 2003). Furthermore, public discourse needs to be fair and competent (Webler,

1995), but also effective in a sense of producing an applicable outcome (Armour, 1995). These criteria are further explained as follows.

Fairness is about "equity" of a particular arrangement among decision-making parties (Kasperson & Kasperson, 2000). People in discursive situations should be provided with an equal footing to determine the agenda and the rules for discourse (Webler, 1995; Habermas, 1991). The competence of deliberation entails the performance of the participants in constructing the best possible agreements, taking into account the knowledge available to them. However, the limitation of aiming at competent discussions is that critical analysis might be an unnatural exertion for the participants. The effectiveness of the deliberation depends on the extent to which the results of the deliberation have an effect on real policies. The consensus-seeking process might itself be strategically used to pursue a concrete political objective (Webler & Renn, 1995) and or to delay the decision-making (Stern & Fineberg, 1996). It necessitates a long-term trust and credibility relationship between the dialoguing partners to maintain the cooperation (Kasperson *et al.*, 1998; Lepa *et al.*, 2004).

The limitations of deliberative democracy make one question about the suitability of the western ideals of participatory governance in more constrained political circumstances. Acknowledging the limitations and finding the ways out of the political and operational constraints should be an aim of the facilitators of democratic decision-making (Webler, 1995). The history of deliberation has seen several models used for involving public into decision-making.

2.1 Tools for public involvement

The type of involvement will depend upon the nature of the political economy in which particular resource management decisions take place (GWP, 2003). Arnstein (1969) created the ladder of participation moving towards increasing levels of involvement: informing, consulting, involving, collaborating and empowering. The International Association for Public Participation suggests

means for satisfying these social goals (Table 1). Consultative methods such as questionnaires or stakeholder meetings are limited only to legitimise policy decisions. More complex citizens' jury, for example, is a way of giving a selection of citizens an opportunity to learn about the problem and come up with a knowledgeable decision about the solution for the issue.

Focus groups are widely defined as meetings to obtain public understandings on a distinct area of interest in a permissive environment (Morgan, 1997). In a relaxed atmosphere, a group of six to eight people share their ideas and perceptions. Within a smaller group, the participants usually feel that they have a larger influence on the discussion, and it is easier to tempt reticent participants to contribute. Focus groups can provide a method suitable for getting a brief understanding of an area not previously covered (Morgan, 1993; Wibeck, 2000). As the participants themselves are largely guiding the discussion, they might come up with completely new approaches to an issue (Uusküla & Kangur, 2006). The following section will give

an overview about the focus groups conducted in Talas and Chu River basins.

3 Public involvement experiences in Talas and Chu River basins

The initial aim of conducting focus groups was to gather information for drawing guidelines for the work of the Transboundary Water Commission of Talas and Chu basins. Focus groups were chosen as it enables to get a quick idea of the area that has not been previously covered in research. Before assessing the suitability of the focus groups format in Kazakhstan and Kyrgyzstan water management context, a short overview about the methodology and key findings is presented as follows.

Local water management experts were involved in planning the focus groups. In recruiting the focus groups, local water users, rural government bodies, and water facilities management bodies were approached to form groups of five to eight people. In order to cover diverse viewpoints of stakeholders from different locations, 13 focus groups were

Table 1. Classification of participatory approaches according to their social goals (Adapted from IAP, 2008)

INCREASING LEVEL OF PUBLIC IMPACT				
INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
Public Participation Goals				
To provide the public with balanced and objective information to assist them in understanding the problem. alternatives. opportunities and/or solutions	To obtain public feedback on analysis. alternatives and/or decisions	To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered	To partner with the public in each aspect of the decision including the development alternatives and the identification of the preferred solution	To place final decision-making in the hands of the public
Examples of techniques				
- Fact sheets	- Public comment	- Workshops	- Citizen Advisory Council	- Citizens Juries
- Web sites	- Focus Groups	- Deliberate polling	- Consensus Building	- Ballots
- Open houses	- Surveys		- Participatory decision-making	- Delegated Decisions
	- Public meetings			

conducted in Kazakhstan and eight on the Kyrgyzstan side of the Talas and Chu River basins. Appendixes 1 and 2 indicate the source, location and language of the conducted focus groups. Focus groups evaluation sheets were used to get more information on the participants' views on the effectiveness of the method. Recorded interview transcriptions were coded and categorised to find trends.

The inhabitants of Talas and Chu River basins were most concerned about water quantity issues: starting from water excess and flooding in certain regions and ending with dire water scarcity that inhibits farming. The participants of focus groups stressed that innovative water management techniques and updating the irrigation infrastructure would help to regulate water supply as well as to avoid water losses. It was stressed that private users and water management authorities have little informational or operational means to improve the current situation.

The focus group participants blamed irrational institutional compartmentalisation for diffusing the responsibilities of water management. The ineffective bureaucracy was held responsible for hindering stakeholder-considerate development of water management. People showed their discontent with the situation, where the decisions are made in inviolable political spheres. Due to poor capacity, the image of the WUAs is low and resistance to their activities hinders any useful progress in water distribution problem solving. Their initial aim of representing local needs has not found regional water authorities' support. Farmers find it unfair that despite the nominal accountability of the WUAs and the financial means designated to the associations, the farmers have very little means to determine the quantity and the timing of irrigation water reaching their lands.

Discrepancies appeared between lay farmers' and *akims'* problem perception. Thus, the solutions that different groups proposed for more equitable sharing of water and better management of the infrastructure differed largely from group to group. For example, the groups of *akims* blamed the

incapacity of the WUAs as a source of all troubles, and suggested that the solution would be the further centralisation of water management decision-making and funds allocation to the regional level. Some farmers' groups, to the contrary, argued that more operative financing according to the local needs, and enhanced cooperation from the local water administrations' side as well as tackling the dominating nepotistic relations would alleviate problems in largely agricultural areas.

The relations between Kazakhstan and Kyrgyzstan concerning sharing the water resources are considered most critical. For example, Kyrgyz groups found it unfair that the Kazakhs contribute minimally to the management of the waterways that bring the water from Kyrgyzstan to Kazakhstan. In addition, farmers on both sides accuse the other countries of wasteful use of waters. For example, a farmer from Pokrovka expressed his sensation of injustice of water division between the Kyrgyz rural areas and Kazakhstan towns: "I cannot comprehend how is it possible that in Djambul there is water even in the most peripheral streets, but people in the close-by Kyrgyz villages do not get any water supply". Kyrgyz farmers and WUA groups doubt the correctness of the records on water quantities let over the Kyrgyz-Kazakh border and suspect the Kyrgyz reservoir managers of co-opting with Kazakh government. These are only a few vital issues frequently discussed in focus groups. Yet, from the point of view of this article, the assessment of the focus group process and outcomes are more important.

3.1 Participants' views on the focus groups

Participants were presented a questionnaire where they could comment on their expectations before the meeting and the fulfilment of these expectations. Furthermore, their information gain and alignment to take part in the focus groups discussions again was asked. The participants were willing to contribute, as their objective was to get new information about the water management institutions (including Kazakh and Kyrgyz Joint Commission) and expertise for better water management (44%). The discussion group members expected to reach concrete solutions for their problems (e.g. how to

get funds for renovations, cooperation partners etc.). 20 % of the participants were enthusiastic about participating for socialising with representatives of other organisations and neighbouring villages. One of the focus group participants expressed his support for inclusive decision-making: “Water is the source of living, hope for the life and every man has to be able to decide”. Some people explained that they had turned up to the meeting as they felt it was their duty.

Participants assessed their fulfilment of expectations on the focus group results on the five rank scales. Over three quarters of the participants showed their contempt with the results of the focus groups (Table 2). It appeared that up to half of the participants gained a lot of information, whereas 35% gained no new knowledge. Participants found out information on water management and related organisations as well as on the activities of the Kazakhstan and Kyrgyzstan Joint River Basin Commission. Participants appreciated the possibility to get in touch with possible partners for cooperation in the modernisation of water supply and irrigation systems. Except for the local government officials and regional water management authorities, the participants’ impressions about the meetings were generally positive. The possibility to raise problems, discuss them openly and propose solutions - contribute “their heart and best vision” as one expressed, was appreciated.

Despite the generally positive response of the participants, some focus group attendees also remained cautious about the long-term effects of the focus groups meetings. For example, a Talap village WUA member explained his unrest: “We can only judge the success of the meeting when

the water questions are solved!” Many of the focus group participants were discontented with the fact that the focus groups did not suggest any solution for systematic and coordinated management of water in each country as well as in terms of the stance that should be taken towards the neighbouring country. Reasons given for willingness to participate again in the focus groups type of activities was to get information about developments in the water management issues and come up with solutions.

In order to get an overview of the general dynamics of discussion groups, the atmosphere was observed by the assistant as well as the moderator of the meetings (Figure 1). In several focus groups younger people and female persons were quieter and listened to what older people had to say. Status hierarchies appeared to be important as other participants and water specialists only talked after *akims* had had their say. For example, in one of the WUA representatives’ group, their leaders also tended to dictate the discussion. Regional water management authorities’ representatives and local government officials demonstrated their irritation regarding the situation they had been set into. They found it inappropriate that they would have to explain and protect their views among the lay water users invited to the focus groups.

4 Discussion

Water management in Talas and Chu river basins offers compelling material for analysis due to the complexity of social impacts and ambiguities related to water use. Kazakhstan and Kyrgyzstan have the main components of water management in place. However, the political capacity of the interest groups varies: technical experts and bureaucracy

Table 2. Evaluation of focus group process from the point of view of involved stakeholder representatives (% of respondents)

	TO A LARGE EXTENT	1	2	3	4	5 NOT AT ALL
Fulfillment of expectations		53	22	19	5	1
Gained new information		49	19	23	4	5
Possibility to utter one’s opinion		73	7	16	4	0
Readiness to participate again		76	12	3	7	2



Figure 1. Focus group with farmers from Birdik village

have gained the ruling position, while silencing lay water users. Introducing participatory discourse in water management could help to determine the different ideas of participants on the goals of development and the limits of tradeoffs that they were ready to assign for common benefit.

The WUAs are expected to facilitate interaction between the lay water users and the regional management authority. However, due to their co-opt ties and overlaps in recruitment, the WUAs' agenda is often determined by the regional and local administrative bodies. As the model does not make an explicit commitment to the autonomy of the individual members, there is a danger that the consensus could be a "fake" consensus, as some participants might feel pressured to conform. Thus, domestic water users and irrigation farmers have little means to make their views known and represented in the water policy-making and its operations. Enhancing dialogue and cooperation on different spatial and institutional dimensions requires more effective means for communication. One of the possibilities for fulfilling the information

gap between the lay people and the transboundary commission was carrying out focus groups for identifying the grass-root needs.

Focus groups fulfilled the task in getting first hand information about the stakeholders' views and needs. However, the representativeness of focus groups was minimal. The focus groups reflect opinion of a fraction of more active people, or members or community with higher sense of duty. Due to the cultural setting and due to the selection of members, focus groups did little to facilitate constructive dialogue among different stakeholders' communities. Comparison of the water users' associations and focus groups mode of participation in decision-making is presented in Table 3.

4.1 Ensuring powerless discussion

It is an important structural requirement of rational discourse that all the parties share equal positions (Habermas, 1991; Renn & Tyroller, 2003). The reality of focus groups showed that it is very difficult to reach this ideal. Involved members of the public belong to various social groups, and therefore,

Table 3. Qualities of water users' associations in comparison with focus group method

TECHNIQUE	Focus Group	Water User's Associations
DESCRIPTION	<ul style="list-style-type: none"> Group of ordinary citizens sharing a common background deliberate on a set of issues 	<ul style="list-style-type: none"> Group of stakeholders representing water users interests or expertise, to provide informed input (advisory body assisting decision makers)
REQUIREMENTS	<ul style="list-style-type: none"> Both systematic and anecdotal knowledge Need team of skilled moderators Free discussion 	<ul style="list-style-type: none"> Define roles and responsibilities upfront Be forthcoming with information Use a credible process Select members carefully
NUMBER OF PARTICIPANTS	<ul style="list-style-type: none"> 5-10 people members of public Number of focus groups: until the saturation of gained information 	<ul style="list-style-type: none"> Small group of (10-20) stakeholders
DURATION	<ul style="list-style-type: none"> Meeting: 90 minutes Process: 1 month 	<ul style="list-style-type: none"> Recurring meetings Eventually institutionalised
APPLICATION	<ul style="list-style-type: none"> Early phase of decision-making to obtain views of different social groups 	<ul style="list-style-type: none"> At any point in the decision-making process but seems to be mostly effective in the early stages
ADVANTAGES	<ul style="list-style-type: none"> Opportunity to develop various views on development Possible consolidation of interest group 	<ul style="list-style-type: none"> Provides for detailed analyses of issues Commissioning of expertise, sanctioning and veto depending on mandate
DISADVANTAGES	<ul style="list-style-type: none"> No deliberation among the stakeholder groups Find participants able and willing to dialogue 	<ul style="list-style-type: none"> Neither general public nor river basin councils may embrace committee's recommendations Time- and labour-intensive

embody numerous and sometimes conflicting responses to water management. Traditional patriarchal community relations are dominant among the inhabitants of the Talas and Chu River basins. The overrepresentation of older male persons is a sign of a social system, where possibly more experienced men are expected to come up with decisions important for the community. Gathering into deliberation groups was acceptable to many. Even after the years of communism, close-knit community relations and joint decision-making is familiar to the people living in the basin. Thus, deep-rooted patriarchal legal culture provides steady regulating principles that guide decision-making even in changing political environments.

For a discussion to be called deliberative, it is essential that it relied on the mutual exchange of arguments rather than decision-making based on the status of the participants or sublime strategies of persuasion (Habermas, 2001; Renn & Tyroller, 2003). In focus group discussions quieter and more dominant, outspoken participants appeared. The presence of people sharing power positions (heads of water user's associations or *Akimats*)

determined the span of the process. Following the conventions of patriarchal system, the lay people let the representatives of power positions dominate the discussion. The *akims* showed eloquence in public speaking and articulated their views in a more convincing manner. Despite the moderators' numerous attempts to encourage contributions from quieter participants, the dialogue often remained restrained, as the participants appeared to be scared to step out against the regulator. The aim of the public participation practitioner should be to identify and compensate for these social, cultural contexts of unequal access to setting the agenda and contributing to decision-making.

4.2 Lessening bounded rationality

Deliberation is expected to lead to changes in attitudes amongst the participants, and to lessen the bounded rationality of the individual members of the community. Free-will based groups might mirror the opinions of a more interested and/or more reactive segment of population. Focus groups evaluation sheets demonstrated that the participants valued the opportunity to get to know

other perspectives on water issues, talk about the related problems and elaborate possible solutions in a common circle. In a pleasant atmosphere, focus groups participants facilitated each others thinking, and as a result, even some innovative solutions (e.g. less bureaucratic financing schemes) were prompted. However, the focus groups lagged behind in offering possibilities for synthesising and enriching nominated experts and decision makers' views with the lay perspectives on water management and development needs. Of course the focus group model does not provide a very good means for balancing the participants awareness building through exchange of experiences and brainwashing them.

Focus groups worked as a tool for mapping the needs of the stakeholders, though the participants did not suggest any means for integrating and evaluating recommendations from the point of their overall importance. Groups of farmers and water users did not promote critical inquiry into the broader issues of water management and sustainable use of water. To the contrary, when discussing vital water management issues, participants often became whipped up emotionally and made what could appear from the point of view of experts' irrational choices. Thus, it can be argued that the discursive process, where participants have to come up with well-supported insights under group pressure sets deliberators in an artificial situation that may divert them away from their everyday thinking patterns. Furthermore, as the status hierarchies appeared among the discussion participants, it is hard to distinguish between awareness building and brainwashing regarding the water management options.

4.3 Effect of deliberation on policy making

The case study under analysis shows that the restrictive political culture in Kazakhstan and Kyrgyzstan could be more supportive of public involvement in water management decision-making. Reproducing western patterns of policy-making cannot be successful if they are not integrated into local cultural and communal traditions. The benefit of the conducted focus groups lies in the articulation of some interest groups' problems. However, the

solutions proposed lie on hypothetical grounds as the focus groups format does not allow feedback to the elaborated position from other stakeholder groups nor from the authorities. The deliberative model does not suggest any means to evaluate the proposals from the point of their overall importance. Thus, the discrepancies between, for example, *akims'* and irrigation farmers' problem perceptions and solutions could not be overcome.

The outcomes of discussions were communicated to representative institutions and thereby fulfil a complementary role in the decision process. Since the Joint Commission for the Management of the Talas and Chu Rivers only started its work in 2006, it is early to say how much effect the deliberations had on real policy outcomes. It is also not in the scope of this project to determine the extent to which the problems highlighted in focus groups have been taken into account in the Joint Commission's work. However, the process has been unsuccessful in a sense that the participants have received little or no comments about their suggestions, and the deviations from the recommendations have remained unjustified.

Deliberative processes take time and financial resources to organise, but the investment may be worthwhile as the participatory models may build up the contributors' self-consciousness. The Talas and Chu River basin focus groups evaluation sheets indicated high satisfaction related to opportunities for exchanging thoughts and finding cooperation partners among the participants. Contributing to focus groups may have been a good exercise for the people whose participation in policy making is restricted to the mal-functioning representative democracy. Therefore, it can be assumed, that experiences of political involvement can be especially emancipative for the societies in transition from the command ruling to the more democratic forms of governance. However, the therapeutic effect of public involvement may remain short-term if regulators do not acknowledge its results.

Means for socialising and finding partners for joint actions were considered an important outcome of the focus groups. This suggests that the current

means, WUAs, are do not offer fully legitimate representation and successful protection of the local's needs. Lack of means of the water users to satisfy their needs in the water management can be attributed to the shortage of social capital to influence the decision-making. However, a look beyond the community level relations shows that the clarity of responsibilities of multiple water management institutions on different levels is lacking. Thus, the lay water users confusion and disappointment in being able to address their needs and seek for liable assistance. Prior introducing any new techniques of involvement, would they be sporadic events like the focus groups conducted for informing Kazakhstan-Kyrgyzstan Joint Commission or more institutionalised practices, the functions and responsibilities of informants and decision-makers needs to be clarified and ensured.

5 Conclusions

Conducting focus groups in the Talas and Chu River basin for informing the Kazakhstan and Kyrgyzstan Joint Commission taught several lessons regarding the factors limiting and facilitating the deliberative decision-making in Central Asian water management. Kazakhstan and Kyrgyzstan political systems could be more supportive of public involvement in water management decision-making.

Although close-knit community relations and joint decision-making is familiar to the people living in the Talas and Chu River Basin, the prevailing patriarchal conventions are also the root cause of the hierarchies in consensus-finding processes. As the focus groups showed, despite the nominated equal positions of all members of the groups, older and male persons, as well as the representatives of local administrative bodies dominated the consensus-finding process.

The focus groups showed that alterations to current decision-making institutions are direly needed and welcomed at least by the rural inhabitants whose interests are poorly represented. Lost trust and credibility of the WUAs and regional water management administrations may also extend to the Kazakhstan and Kyrgyzstan Joint Water Commission, and thus inhibit its functions. Well-

thought through models of public involvement could offer possibilities for synthesising nominated experts' views with the lay perspectives on water management and development needs. Despite the limitations, the focus groups type of models could play a complementary role for clarifying the variety of needs and development views from outside the water management bureaucracies. However, caution should be born in mind when reproducing western patterns of policy-making if they are not supported by local cultural and communal traditions.

The knowledge about alternatives for current management practices is still scarce among the environmental regulators that are used to command and control approaches. Prior introducing any further models for involvement, it is important to acknowledge and endeavour to tackle the limitations of participatory democracy. A major step toward this would be clear clarification and enforcement of the rights and responsibilities of (inter)-state water management institutions, civil society based organisations (e.g. WUAs) and the individual members of community. A clear set of rules for incorporating the social partners in decision-making would allow power institutions to maintain their initiative and the leader position in policy making.

More research should be encouraged on the suitability of the participatory tools adjusted to the specific socio-cultural, economic, and geopolitical conditions. Better understanding of the limits and advantages of the inclusive models would enable governments to establish standards for public involvement.

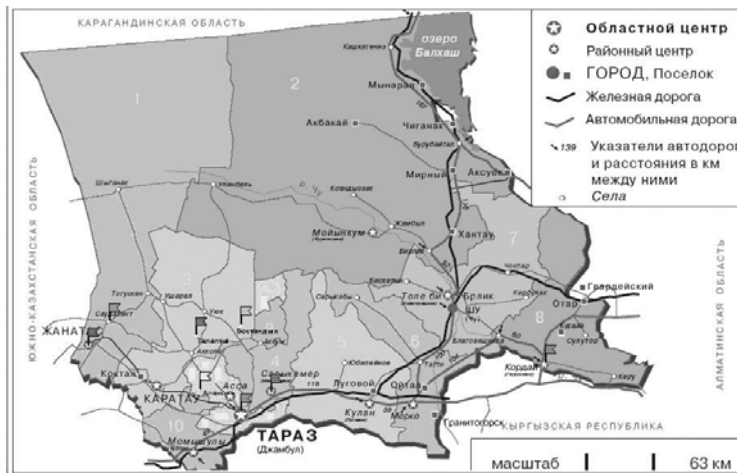
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Место проведения фокус группы	Тип фокус группы
с. Вирдик Бэсжэ – Атинского района Чуйской области, Кыргызстан	Представители крестьянских хозяйств (КХ)
с. Чуй Чуйского района Чуйской области, Кыргызстан	Представители Районного Управления Водного Хозяйства
с. Ивановка Бэсжэ – Атинского района Чуйской области, Кыргызстан	Представители крестьянских хозяйств
с. Кельин Кельинского района Чуйской области, Кыргызстан	Представители Районного Управления Водного Хозяйства
с. Кен-Будун Бэсжэ – Атинского района Чуйской области, Кыргызстан	Представители органов местного самоуправления (МСУ)
с. Кенеш Бэсжэ – Атинского района Чуйской области, Кыргызстан	Представители Ассоциации водопользователей (АВП)
с. Красная Речка Бэсжэ – Атинского района Чуйской области, Кыргызстан	Представители НКО (некоммерческих организаций)
с. Миллифан Бэсжэ – Атинского района Чуйской области, Кыргызстан	Представители Ассоциации водопользователей (АВП)
с. Кызыл-Жылдыз Манасского района Таласской области, Кыргызстан	Представители НКО (некоммерческих организаций) 2) Представители Ассоциации водопользователей (АВП) 3) Представители крестьянских хозяйств (КХ)
с. Покровка Манасского района Таласской области, Кыргызстан	Представители органов местного самоуправления (МСУ) 3) Представители Ассоциации водопользователей (АВП)
с. Аманбаево, Карабуузинского района Таласской области, Кыргызстан	Представители органов местного самоуправления (МСУ) 2) Представители Ассоциации водопользователей (АВП)

Appendix 1. Focus groups conducted in Talas and Chu River Basins in Kyrgyzstan



с. Саудакент, Джамбыльская область, Казахстан	1) Представители Управления Водного Хозяйства (частный сектор) 2) Представители Управления Водного Хозяйства (РПП) 3) Акимы сельских районов 4) Представители крестьянских хозяйств (КХ)
г. Жанатас	Представители Управления Водного Хозяйства (Горводоканал)
с. Бостандык, Джамбыльская область, Казахстан	Представители крестьянских хозяйств (КХ)
с. Атакел, Джамбыльская область, Казахстан	Представители Управления Водного Хозяйства
с. Сарыкмер, Джамбыльская область, Казахстан	1) Представители Сельских кооперативов водопользователей 2) Акимы сельских районов
г. Тараз, Джамбыльская область, Казахстан	Представители НКО (некоммерческих организаций)
с. Талыпты, Джамбыльская область, Казахстан	3) Акимы сельских районов
с. Кордай, Джамбыльская область, Казахстан	1) Представители Управления Водного Хозяйства (РПП) 2) Представители Управления Водного Хозяйства (РПП) 3) Акимы сельских районов 4) Представители крестьянских хозяйств (КХ)

Appendix 2. Focus groups conducted in Talas and Chu River Basins in Kazakhstan

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Biographies

Farida **Abdullaeva** completed her B.Sc. studies in 2006 on natural science at the Urgench State University, Uzbekistan. Starting 2004, Farida started working as a lab and field assistant of ZEF/UNESCO international project. In 2008, she successfully finalized her M.Sc. thesis. Mrs. Abdullaeva works as project assistant for ZEF/UNESCO project in Khorezm region of Uzbekistan. Email: farida@zef.uzpak.uz

Iskandar **Abdullayev** holds PhD on water management. He worked as assistant of Professor at Tashkent Institute of Irrigation until 1999. In 1999, Dr. Abdullayev with group of water professionals has formed Association of Uzbekistan for Sustainable Water Resources Management-Suvchi- professional unit of the educators, researchers and practitioners on water resources management. For 2001-2007, he worked as a researcher at the International Water Management Institute. Since April 2007, Dr. Abdullayev is working as Senior Researcher in the Center for Development Research (ZEF), Bonn, Germany. E-mail: i.abdullaev@uni-bonn.de

Victor **Dukhovny** is a Civil Engineer in Land Reclamation and Drainage. Professor Dukhovny, Doctor of Science in Water Economics, is acting as the Director of Scientific-Information Center of the Interstate Commission for Water Coordination in Central Asia. Vice-President of ICID, member of Board of Directors of IWRA and Board of the World Water Council. Email: dukh@icwc-aral.uz

Björn **Guterstam** is Network Officer for Central Eastern Europe, Central Asia & Caucasus and China at Global Water Partnership Secretariat, Stockholm. Björn's Ph.D. is in Marine Ecology from the Institute of Marine Sciences, University of Kiel, Germany. He has been a scientist and teacher on Baltic Sea environmental issues for 25 years. Within the science of Ecological Engineering he developed and demonstrated a concept to manage wastewater as a resource. Björn is Swedish and has been Chair of Swedish Friends of the Earth and the Coalition for a Clean Baltic, and is a board member of the International Ecological Engineering Society and the Swedish Aral Sea Society. Email: bjorn.guterstam@gwpforum.org

Stuart **Horsman** is a research analyst at the Foreign and Commonwealth Office. He previously taught at the University of Bradford and University of Sheffield. He has published widely on Central Asian affairs. His publications include "The Politics of Mountain Toponyms in the Pamirs" Area, Vol. 38, No 3, 2006; "An all-encompassing definition of Terrorism: Central Asian governments' portrayals of the IMU and Hizb ut-Tahrir" *The Third World Quarterly*, Vol. 26, No 1, 2005; "Uzbekistan's involvement in the Tajik Civil War 1992-97: domestic considerations", *Central Asian Survey*, 18(1), 1999, p. 37-48. Email: stuart.horsman@fco.gov.uk

Kati **Kangur** is a PhD candidate at King's College London since October 2006. Her studies focus on the implementation of EU environmental health directives in new EU member states. Her previous work in an NGO, Peipsi Centre for Transboundary Cooperation and in the Estonian University of Life Sciences involved implementation of IWRM principles in Baltic States and Central Asia. Email: Kati.Kangur@kcl.ac.uk

John **Lamers** studied agronomy and plant nutrition in The Netherlands and holds a Ph.D in agro-economics from Hohenheim-University, Germany. More than 20 years of professional experience in long-term and short-term missions as researcher, government advisor, development worker and consultant. At present project coordinator of the ZEF/UNESCO project in Uzbekistan. Email: j.lamers@zef.uzpak.uz

Bo **Libert**, the UNECE Regional Adviser on Environment, has previously held various positions in research, government and management, including with the Swedish Environmental Protection Agency and the OECD. Dr Libert, a Swedish citizen, has published various publications in the agricultural and environmental fields including a monography on agriculture and the environment in the former Soviet Union. Email: bo.libert@unece.org

Nazir **Mirzaev** is a Civil Engineer in Hydro Construction, Candidate of Science in Land Reclamation and Drainage. Dr. Mirzaev is acting as Senior Research Worker of SANIIRI and Regional Coordinator of the Project Component "Integrated Water Resources Management in Fergana Valley" executed in association with IWMI (Tashkent Office) under financial support from Swiss Agency for Development and Cooperation. Email: nazir_m@icwc-aral.uz

Fatima **Nurmetova** obtained B.Sc. on agronomy from Urgench State University. She completed practical work at Weihenstephan University in Germany in 2007-2008. Mrs. Nurmetova is conducting MSc research on farmer's perceptions in irrigation systems of Khorezm region, Uzbekistan within scope of ZEF/UNESCO project at present. Email: fotima1984@mail.ru

Miina **Porkka** is a master's student in Water and Environmental Engineering at Helsinki University of Technology. She is interested in water resources management, impact assessment and interactions between water and social issues. Email: mporkka@cc.hut.fi

Muhammad Mizanur **Rahaman** is a researcher at the Water and Development Research Group, Helsinki University of Technology. His research interests are integrated water resources management, transboundary river basin management, global water policies and water treaties. He is currently serving as an editorial board member of *Water International* and *International Journal of Sustainable Society*. Email: mizanur.rahaman@hut.fi, muhammadmizanur@gmail.com

Suvi **Sojamo** is a master's student at the University of Helsinki in the major of Environmental Science and Policy. This paper is a part of her Bachelor's thesis on transboundary water conflicts and cooperation. Email: suvi.sojamo@helsinki.fi

Vadim **Sokolov** is a Civil Engineer in Hydro Construction, Candidate of Science in Hydrology. He is acting as Deputy Director of Scientific-Information Center of the Interstate Commission for Water Coordination in Central Asia. At the same time, Dr. Sokolov is the Co-Manager of the Project "Integrated Water Resources Management in Fergana Valley" executed in association with IWMI (Tashkent Office) under financial support from Swiss Agency for Development and Cooperation. Also he is the Regional Coordinator of the Global Water Partnership for Central Asia and Caucasus (GWP CACENA). He is a member of International Water Resources Association. Email: vadim@icwc-aral.uz

Rachel **Strickman** is studying towards a master's in Plant Biology at the University of Helsinki. She is interested in ecosystem restoration and other practical applications of plant ecology. Email: rachel.strickman@helsinki.fi

Pertti **Vakkilainen** is Professor of Hydrology and Water Resources Management at Helsinki University of Technology, Finland. He is one of the pioneers of IWRM practice in Finland, being actively involved in integrated planning processes since 1970s. Email: pertti.vakkilainen@hut.fi

Olli **Varis** is a Professor at Helsinki University of Technology, Finland. He has a broad and interdisciplinary experience on water, environment and development research and consultation. He is currently the Vice President of International Water Resources Association. He is the author of 330 scientific papers. His research concentrates on environmental and social impacts of water policies and integrated water resources management in developing countries. Email: olli.varis@hut.fi

Manijeh Mahmoudzadeh **Varzi** pursued her primary studies in irrigation in Sari Faculty of Agriculture in Iran. Then she studied for her master's degree in international land and water management in Wageningen University, the Netherlands, where she became familiarized with both concepts of IWRM and institutional aspects of water management. Her work experience relates to irrigation system design. Email: m.mahmoudzadeh@gmail.com, manijeh.mahmoudzadeh@wur.nl

Kai **Wegerich** is an Assistant Professor at Wageningen University. He previously worked as a researcher for the Centre for Development Research [ZEF] and as a development worker for the German Development Service [DED] in Khorezm/Uzbekistan. His research interests are social and political aspects of water management in Central Asia. He conducted fieldwork in Uzbekistan, Kazakhstan, Kyrgyzstan and Afghanistan. Email: wegerich@yahoo.com, kai.wegerich@wur.nl

CENTRAL ASIAN WATERS

Social, economic, environmental and governance puzzle

Muhammad Mizanur Rahaman & Olli Varis (eds.)

The Aral Sea has lost most of its water but why? The region is not particularly dry in terms of available, renewable water resources per capita. Uzbekistan, the country at the center of the Aral Sea Basin, has more water per capita than for instance Spain. The problem is the massive water use in the production of agricultural products, particularly cotton. The water use per capita is higher than anywhere in the world and although 17 years have passed since the collapse of the USSR, the economy is still being built on many of the same pillars than before. The economic return from the water used remains strikingly low.

This book includes 11 articles that scrutinize the economic, environmental, social and governance challenges of Central Asia; the region that is not limited to Aral Sea basin but encompasses Uzbekistan, Tajikistan, Kyrgyz Republic, Kazakhstan, Turkmenistan and northern Afghanistan. The book consists of two parts. The first one, consisting of three chapters, provides an introduction to the problematique and institutions. Those chapters are being authored by the three partners of this book, Helsinki University of Technology, Global Water Partnership and The Interstate Commission for Water Coordination of Central Asia.

The second part of the book includes eight research articles. The first of them presents a regional institutional analysis of water management in Central Asia. Two subsequent chapters analyze the Central Asian water challenges from the direction of Afghanistan. Then three articles centered on Uzbekistan follow. They are followed by two analyses of the Chu Talas Basin which is shared by Kyrgyz Republic and Kazakhstan.

The book has been produced within the GWP-CACENA Project, with the funding of the Ministry of Foreign Affairs of Finland. Our sincere hope is that this book will lubricate and bring new insight into the discussion of water management in Central Asia.