

Helpdesk Research Report: Water and Energy in Central Asia

Date: 07.05.2010

Query: What research has been published on the political economy of trans-boundary water and energy issues in Central Asia, including Kyrgyz Republic, Tajikistan, Uzbekistan, Turkmenistan and Kazakhstan?

Enquirer: DFID

Contents

1. Overview
2. A good place to start
3. Water politics in the Aral Sea Basin
4. Water, conflict and regional security in Central Asia
5. The Chu Talas Basin Agreement
6. Further information

1. Overview

A range of research has been published on the political economy of trans-boundary water and energy in Central Asia. Much of the existing literature appears in academic journals and straddles the disciplines of international relations, international development, water policy and environmental management. Some policy documents have also been included in this response on account of the fact that they provide clear and concise overviews of the main social, political, economic and environmental issues at play.

Much of the literature included here covers common ground on the following issues:

- Historical factors in the region and the legacy on water allocation of Soviet Rule – although there is some variation in opinion over the extent to which Soviet-era water and energy allocations have contributed to instability, conflict and environmental degradation;
- The various mechanisms and institutions that exist to facilitate regional cooperation. There appears to be some consensus that national leaders only play lip service to regional agreements and that political-will is lacking. Much of the literature here also suggests that international actors should act in a manner that reinforces regional cooperation;
- Local and community level organisations, such as Water Users Organisations (WAU), which need to be involved and included in the formation of regional water and energy policy;
- The potential for conflict in the region arising from disputes over different water and energy needs between upstream and downstream countries. There are a number of papers devoted to issues of water, conflict and security;
- Although not strictly within the scope of this response, a number of papers highlight the potentially destabilising effects of development in Afghanistan on water allocations in Central Asia.

The literature suggests that the region is perceived to be strategically and geopolitically important by a number of external actors. The contemporary role of the US, Russia and China in region is

briefly referred to in some of the articles presented here, but detailed analysis on their role, influence and impact was not found during the research period for this response.

2. A good place to start

Granit, J., Jagerskog, A., Lofgren, R., Bullock, A., de Gooijer, G., Pettigrew, S., and Lindstrom, A., 2010, 'Regional Water Intelligence Report Central Asia', Baseline Report, SIWI, Stockholm www.sivi.org/documents/WGF/Reports/Paper-15_RWIR_Aral_Sea.pdf

This report from the UNDP's Water Governance Facility (WGF) provides a political economy analysis of trans-boundary water issues in Central Asia. It highlights the links between water, energy, food security and human security and presents a number of key messages on these issues:

Water and economic growth

Post-independence, water use is being developed within a different regional framework with independent states promoting individual water development tracks unilaterally. This has increased stress on trans-boundary water resources and the declining Aral Sea, drought and low levels of reservoir storage are visible results of water resource mismanagement.

Water governance

Challenges to economic development and water reform are posed by a lack of transparency, corruption and democratic freedoms. Central Asian states are also at risk of political instability, which can have detrimental consequences on the long-term management of water resources.

Hydropower potential

Tajikistan, Kyrgyzstan and Afghanistan are striving to develop their hydropower potential, given that about only 8 percent of the hydropower potential of the region has been developed. There are five large hydropower plant projects at different stages of progress, all located in Tajikistan and Kyrgyzstan. However, downstream countries have expressed fears that the considerable storage capacities of the largest projects will potentially impact upon the water supply to millions of citizens.

Water storage for hydropower generation and irrigation:

Increasing winter storage and ensuring release regimes for summer irrigation in the downstream riparian countries will benefit all parties if energy during the winter can be guaranteed for the upstream countries. Thus, it is vital to optimise the use of basin-wide water and energy.

Water-food-energy nexus

Tajikistan and Kyrgyzstan are particularly vulnerable to water, energy, and food insecurities. In 2007/8 a combination of drought, and higher food and fuel prices culminated in a food crisis in large parts of Central Asia. This subsequently highlighted the need for new strategies in the region that link food, energy and water supply chains within and beyond the Central Asian region.

Regional cooperation

Trust is low between Central Asian countries and there are multiple regional organisations with overlapping mandates. This could be due to the fact that Central Asian economies are dominated by irrigated agriculture practices, the outputs of which maintain the ruling elites grip on power. Furthermore, Central Asian states have increasingly adopted "zero-sum" positions on water resources and at the same time have increased consumption to unsustainable levels.

Geopolitical situation

There are signs that the conflicting strategic interests of different regional players might become more complicated. Both Russia and China have key geopolitical interests in the region - the influence of China as an investor in hydropower and as an upstream competitor for water also

appears to be having serious implications for the shrinking of Lake Balkhash in Kazakhstan. The US has a strategic security interest in the region that will not be reduced in the coming years. However, the Shanghai Cooperation Organisation (SCO) including China, Russia and some Central Asian states have shown their readiness to be a counterweight to US interests in the region (e.g. by rejecting a US application for observer status to the SCO in 2005). A fourth "axis" to consider is Turkey, Iran and Pakistan, who all have strategic energy and longer term trade interests in the region.

McKinney, D.C., 2003, 'Cooperative Management of Trans-boundary Water Resources in Central Asia', in Burghart, D. and Sabonis-Helf, T. (Eds), In the Tracks of Tamerlane – Central Asia's Path into the 21st Century'

<http://www.ce.utexas.edu/prof/mckinney/papers/aral/CentralAsiaWater-McKinney.pdf>

This chapter provides an account of the regional water management practices and structures that exist in the region. It also provides an overview of country specific issues with regard to water and energy use in the Amu Darya and Syr Darya basins. It argues that the capacity for shared water management exists in Central Asia, but it is not as effective as it could be. This is partly due to the lack of high-level political-will and the fact that Government officials, particularly those from Turkmenistan and Uzbekistan, prefer to handle water management and other regional issues through the development of bilateral arrangements.

Notwithstanding the above, improved regional cooperation on water management could be facilitated by the following regional frameworks and institutions:

- The Interstate Coordination Water Commission (ICWC) is the highest level of trans-boundary water resources management in the region. It is responsible for water management in the Amu Darya and Syr Darya basins;
- Basin Water Management Organisations (BVOs) operate as executive organs of the ICWC and are responsible for day-to-day operation of the main water supply facilities in the two basins;
- The International Fund for the Aral Sea (IFAS), which was created to attract resources and finance programmes to overcome problems associated with the desiccation of the Aral Sea;
- The Syr Darya Basin Agreement, which was signed by Kazakhstan, Kyrgyzstan and Uzbekistan in 1995 to alleviate problems emanating from differing demands on the use of water in the basin and particularly over the operation of the Toktogul Reservoir in Kyrgyzstan;
- The Central Asian Economic Community (CAEC), which in 1996 stepped in to mediate agreements on water and energy management in the Syr Darya Basin following constraints on the IFAS to act as a neutral broker.

The paper also offers some recommendations with regards to regional water management issues that must be addressed if progress is to be made on water management in Central Asia:

- Country financial obligations to regional institutions such as the IFAS and ICWC must be met. Only Turkmenistan and Uzbekistan have met their obligations for maintenance and operation works under the ICWC agreement;
- All main structures for controlling trans-boundary waters in the Syr Darya and Amu Darya basins should be transferred into the long-term control of the BVOs;
- Water quality problems in Central Asia need to be addressed in a comprehensive manner. This includes adequate and up-to-date equipment to monitor and process water quality data;
- Citizen participation in water management should be increased, particularly the participation of NGOs in the formulation of water-related policy;
- Agreements on water allocation in the Amu Darya basin should take into account the water needs of Afghanistan.

Dukhovny, V. and Sokolov, V., 2003, 'Lessons on Cooperation Building to Manage Water Conflicts in the Aral Sea Basin', UNESCO

<http://unesdoc.unesco.org/images/0013/001332/133291e.pdf>

This article was prepared for the joint UNESCO-Green Cross International Project 'From Potential Conflict to Cooperation Potential (PCCP): Water for Peace'. It provides an overview of the historical, social-political and environmental factors at play in the management of water resources in Central Asia. It also provides a detailed breakdown of regional and national water management institutions and discusses the legal basis for trans-boundary water relations.

Existing regional water management mechanisms have both strengths and weaknesses. However, real regional partnership can help mitigate existing shortcomings if regional integration is improved on the following:

- Regional water basin management and conservation;
- Economic and environmental interests through inter-sector partnerships in each country that take account of environmental requirements;
- The involvement of water users at all levels of the management hierarchy;
- Knowledge and practice through a partnership of science and information exchange with water users and water management organisations;
- International donors and regional bodies – particularly through improved coordination between international financial institutions and the region's countries.

Interestingly, the authors view the ICWC as a unique experiment which has brought the five Central Asian countries together to plan, operate and manage trans-boundary rivers in real time. Furthermore, they argue that cooperation under the ICWC has progressed despite various complexities and differences in social, political and environmental conditions of different Central Asian countries.

Wegerich, K., 2009, 'Politics of Water in Post-Soviet Central Asia', In Dominic Heaney (Ed.), Eastern Europe, Russia and Central Asia 2010, 10th Edition. Routledge. London, pp. 27–31

<http://waterwiki.net/images/9/98/PoliticsofWaterinPostSovietCentralAsia.pdf>

As well as providing an overview of political and economic issues surrounding the sharing of water resources in Central Asia, this chapter provides an update on some recent regional developments.

Since independence, Central Asian countries have coalesced into two blocs: the downstream, riparian states of Kazakhstan, Turkmenistan and Uzbekistan; and the upstream states Kyrgyzstan and Tajikistan. Uzbekistan looked to garner the support of the other downstream countries in order to counter plans of Kyrgyzstan and Tajikistan to construct reservoirs. In April 2009, the Presidents of the five Central Asian states met in Almaty to discuss water issues in the Aral Sea Basin. An analysis of the situation later that year suggests that these two blocs only actually exist on a superficial level. This is reinforced by occurrences in the Syr Darya basin, where Uzbekistan and Kazakhstan made their own bi-lateral contracts with different upstream riparian states.

3. Water politics in the Aral Sea Basin

Spoor, M., 1998, 'The Aral Sea Basin Crisis: Transition and Environment in Former Soviet Central Asia', Development and Change, Vol. 29, pp.409-435. Available by document delivery.

This article focuses on the political economy of the Aral Sea Basin crisis, which it argues is largely an anthropogenic disaster. It analyses attempts made during post-independence transition

of the Central Asian countries - with international donors and newly emerging environmental NGOs - to contain and mitigate the impacts of the crisis at regional and national levels.

Degrees of water dependency vary markedly among the five countries in the region with Uzbekistan and Turkmenistan the main users of externally provided water, and Kyrgyzstan and Tajikistan the main supplier countries. This unequal division of availability and use, within the general context of a regional water deficit, is one of the main sources of tension for current and future river basin water management.

The paper argues that national interests continue to prevail despite the fact that the five presidents have agreed to a more efficient and sustainable use of the water from the Amu Darya and Syr Darya basins. Tension over access to land and water has already provoked some inter-ethnic resource-based conflicts and such tensions might well ignite larger conflicts, particularly in areas such as the densely populated Fergana Valley.

It concludes by stating that a clear change in the political will of the Central Asian leadership is necessary. In spite of official discourse, all Central Asian leaders have underestimated the danger to their economies and human ecology from the desiccation of the Aral Sea. Further, many of the proposed solutions for improving water efficiency and sustainability need a combination of national policies and major international support for infrastructural investments (in irrigation systems, drainage, sustainable agricultural development and reforestation), well above the current level of pledged aid.

Peachy, E.J., 2004, 'The Aral Sea Basin Crisis and Sustainable Water Resource Management in Central Asia', *Journal of Public and International Affairs*, Vol. 15, Spring 2004 <http://www.princeton.edu/jpia/past-issues-1/2004/1.pdf>

This article traces the historical development of water resource management in Central Asia, focusing on the causes of the current Aral Sea Basin crisis. It examines the obstacles facing the Central Asian republics in addressing this problem and offers predictions regarding the future state of the region's ecology, economy, and stability, as well as the health of the region's people. The article also explains how existing plans of action have been largely ineffective and why restoring the Aral Sea to its original state is an impossible task. Finally, it provides feasible policy recommendations on how to prevent the further mismanagement of the region's water while maintaining viable levels of economic development and population growth.

Significant population increases, limited water resources and a depressed economic situation are all important factors that could lead to instability within and amongst Central Asian states. Water serves as the principle economic catalyst and the primary source for growth. The potential for militarisation and conflict amongst states in the region will therefore increased as states vie for control of this limited resource in the face of increasing demands.

The article offers a number of policy proposals to improve water management and mitigate the crisis:

- Approaches to water management should reflect diverse interests, geographies, and applications at the local, national and regional levels of each country. This approach should also capitalise on local, community based initiatives, which best reflect the needs of the populations they serve. Such localised approaches should be housed within Basin Valley Organisations (BVOs) that serve entire river and drainage systems rather than within national governments or sub-national administrations;
- Central Asian governments should work together with independent BVOs to address issues such as water withdrawal quotas. Funds should also be made available to fund BVO and NGO activities rather than projects that are specific to individual countries;
- The international community should provide assistance for the development of a more

coherent and less conflictual management structure and work to ensure that Central Asian states contribute requisite amounts to IFAS.

It concludes by stating that bilateral aid could reinforce regional stability and security; given contemporary geopolitical interests in the region, such stability is integral to the promotion of many nations' foreign policy aims.

Wegerich, K., 2008, 'Hydro-hegemony in Amu Darya Basin', Water Policy, No. 10, Supplement 2, pp.71-88

Independence in Central Asia led to the emergence of inequitable water allocations in the region and gave rise to a perception that Uzbekistan was the hydro-hegemon in the Amu Darya Basin. This paper set out an argument against this perception.

Data presented here on water utilisation trends suggests that, rather than any one country obtaining primacy, each state is actively and passively engaged in competition over use of water from the Amu Darya basin. Control over the flows is contested and the basin is characterised by different riparian states engaged in strategies of resource capture by increasing their water demand without renegotiating the official agreements.

The paper concludes by stating that the Soviet legacy of mutual interdependence means that the emergence of independent self-sufficient states is too costly, both economically and politically and thus not feasible. Therefore, the emergence of a real hegemon in the Amu Darya Basin seems unlikely.

4. Water, conflict and regional security in Central Asia

Sievers, E.W., 2002, 'Water, Conflict and Regional Security in Central Asia', Environmental Journal, Vol. 10, pp.357- 402

<http://www1.law.nyu.edu/journals/envtllaw/issues/vol10/3/v10n3a2.pdf>

This article addresses the role of water and environmental conditions in exacerbating conflict and instability within Central Asia. In doing so it surveys the major water conflicts and the exacerbation of these during the past decade. It also examines the impact of international law and international institutions. Finally, it concludes that foreign aid may actually be contributing to conflict in the region.

Water conflicts in Central Asia may work to decrease regional stability in two major ways. Firstly, they may lead to open conflict between states. Secondly, they may lead to internal weaknesses and hamper the capacity of individual states to address non-state threats such as terrorism, drug cartels and separatist movements.

The water basin tensions in the region that are most likely to lead to decreased stability include:

- In the Amu Darya Basin, the greatest tensions are between Turkmenistan and Uzbekistan. Sources of this tension include the construction of the 'Golden Lake', which could cause a massive diversion of water;
- Increased demand for water resources from Northern Afghanistan as a result of economic development could lead to conflict with downstream riparian states;
- In the 1990s, China began constructing a canal to divert a substantial portion of the Black Irtysh River, which empties in Lake Zaisan in Kazakhstan's heartland.

On the positive side, Central Asian states have embraced multilateral environmental conventions and have taken some strong steps towards resolving longstanding water issues. A primary

example includes an agreement ratified in 2002 in which Kazakhstan agreed to pay Kyrgyzstan several hundred thousand dollars per year to assist the maintenance of water control installations on the Chu and Talas rivers. However, the worrying news is that current water management in Central Asia is 'business as usual' behind a public face of reform. This has subsequently led to a critical worsening of conditions in almost all the critical basins of the region. Furthermore, the substantial aid given to Afghanistan in recent years and increased demands on water will almost certainly mean that conditions in the Amu Darya basin will soon deteriorate further.

One must also take into account that only one state in the region had experienced large-scale conflict during the first decade of independence (Tajikistan, which experienced a civil war). In this regard, Central Asia is amongst the most peaceful regions in the former Soviet Union. However, this peace is fragile, and water related conflicts threaten all countries in the region and have the potential to spill over into Russia, China, Iran, Afghanistan and Azerbaijan.

Kemelova, D. and Zhalkubaev, G., 2003. 'Water, conflict, and regional security in Central Asia revisited', *University Environmental Law Journal*, Vol. 11, No. 2, pp.479-502. New York
http://www.google.co.uk/url?q=http://www1.law.nyu.edu/journals/envtlaw/issues/vol11/2/kemelova.pdf&sa=U&ei=Oe_iS9nXN5_8sQbdpdVB&ct=res&ved=0CB0QFjAA&cd=1&usg=AFQjCNFbYp8zANkWQ58T2bVF2jp4gl7h9w

This paper, written in response to Sievers (2002) contends that the actions of certain Central Asian states and donor agency initiatives violate international watercourse law.

It describes how Uzbekistan - without regional consultation - has developed plans to use winter releases of water from the Toktogul reservoir in addition to beginning construction on a number of new reservoirs such as Rezak reservoir in the Namangam region, and the Karaman Reservoir in the Jizak region. It argues that these projects are illegal and facilitated by the World Bank, who have funded other 'legal' water projects but have turned a blind eye to these 'illegal' ones. Furthermore, these 'unanticipated' reservoirs could preclude future expanded water uses in Kyrgyzstan and further exacerbate the Aral Sea Crisis.

The author's conclude by stating that, if downstream states such as Uzbekistan were more aware of their international obligations and if development agencies respected international law, the risk of regional conflict over water resources could be averted.

Adullaev, I., Manthrithilake, H., and Kazbekov, J., 2006, 'Water Security in Central Asia: Troubled Future or Pragmatic Partnership?', Paper prepared for "The Last Drop? Water, Security and Sustainable Development in Central Eurasia" International Conference, 1-2 December 2006, Institute of Social Studies, The Hague, Netherlands.

This conference paper explores some of the geopolitical factors that impact upon water allocation in the region. It also provides a discussion of potential water conflicts and subsequent measures to prevent these.

Water resources in the Central Asian states are inextricably linked to the overall geopolitical situation in the region. For example, Pakistan and China provide potential export markets for hydro-electric power generated in Kyrgyzstan and Tajikistan. In addition, energy companies based in neighbouring states (e.g. Russia, China and India) are vying for control of hydro-electric power stations located in Kyrgyzstan and Tajikistan.

Economic differences between Central Asian countries may have a future impact on patterns of water usage and conflicts in the region. This is particularly the case if more economically developed countries in the region begin to take independent actions to capture or divert trans-boundary water resources. Oil-rich and economically strong countries such as Kazakhstan and

Turkmenistan may begin to change their water use patterns or construct water infrastructure on trans-boundary water resources. Tajikistan's 'Golden Lake' development, Kazakhstan's attempts to restore the northern part of the Aral Sea and Uzbekistan's construction of a dam to capture winter flows from the Syr Darya are all examples of developments which could enhance tensions.

There are a number of potential causes of serious water resource related conflicts in the region:

- The change of operational regimes of the Toktogul reservoir and the Naryn river hydropower cascade in Kyrgyzstan to meet winter energy needs have had an impact downstream where the welfare of around 15 million people depends on irrigation water released during the summer months;
- Upstream populations are trying to change historical water distribution in small scale tributaries – particularly upstream populations who want to increase water abstraction, which in turn affects supplies to downstream areas;
- The allocation of water from the Amu Darya between Uzbekistan and Turkmenistan is allocated on a 40:40 basis, a remnant of the Soviet-era. This is despite the fact that the river basin is inhabited by 14 million people on the Uzbekistan side and only 4 million on the Turkmenistan side;
- The impact of Afghanistan claiming water from the Amu Darya river could reduce water availability in Uzbekistan and Turkmenistan.

The authors conclude by proposing a framework for the prevention of water related conflict in the region:

- Support should be given to countries in the region to sign a Central Asian Water pact that regulates the division of trans-boundary water resources. Under this pact, each country's water usage should be determined by the population size and the role that the country plays in the formation of water resources. Lessons can be learned from experience in the Mekong, Jordan and the La Grande river basins;
- Maximum opportunities should be given for water management institutions to cooperate at the regional level rather than setting up new national level entities;
- Special funds should be made available through the Central Asian Bank for Development to finance the maintenance and operation of the entire water-management system across the region.

Chait, E.A., undated, 'Water Politics of Syr Darya Basin, Central Asia: Question of State Interests'

<http://www.envsec.org/centasia/proj/ferghana/reports/Chait.pdf&sa=U&ei=qabiS6O6GeeVsQacyLQw&ct=res&ved=0CBwQFjAC&cd=3&usg=AFQjCNEEv8-kHmKVSti6gWVlaLVSRBm1QQ>

This paper looks at how effectively Central Asian countries have combined national interests with regional concerns. It contends that national leaders have been pursuing individual development policies with regard to the Syr Darya at the expense of regional cooperation – which increases the potential for conflict.

Respective state claims to Syr Darya waters are based on the following justifications:

- Kyrgyzstan, which is blessed with water, has sought to control more of the water that forms on its own territory in order to increase irrigated agriculture and generate more hydro-electric power. It contests its own allocation of water, agreed as part of the 1992 water sharing agreements, which entitled Kyrgyzstan to only 20-25% of waters formed within its territory on the Syr Darya. Kyrgyzstan also upholds that Uzbekistan and Kazakhstan should share the burden for operational and maintenance costs of storage and control infrastructure along the Syr Darya;
- Securing sufficient quantities of water for agricultural use is a vital issue for Uzbekistan, particularly for the cultivation of cotton upon which the economy is dependent on. It therefore

- strongly supports the allocation it receives under the 1992 agreement;
- Water quality and quantity have both been sources of contention between Kazakhstan and Uzbekistan. In Southern Kazakhstan, waters arrive directly from the pesticide-treated cotton fields of Uzbekistan with little treatment. Water quantity is of immediate concern because the Syr Darya is the main source of water for irrigating cotton and rice fields and to sustain animal husbandry.

The author argues that existing regional water management mechanisms are not effective due to a combination of inappropriate funding and a lack of appropriate authority. Therefore, conflict over the Syr Darya is probable in the mid-term and the potential further increases if: (1) divergent economic paths lead to increasing incompatibility amongst states' water development programmes; and (2) local-level conflict over water and land-use between ethnic groups negatively impact upon inter-state relations.

Luong, P.J. and Weinthal, E., 2002, 'New Friends, New Fears in Central Asia', *Foreign Affairs*, Vol. 81, No. 2

This article examines the implications of US policy towards Central Asia. Of particular interest is a section on water where the authors argue that issues of water resource management are intimately linked with drugs cultivation and refugee flows from Afghanistan.

Any plan to rebuild Afghanistan must include agricultural development, and this will increase water usage and potentially threaten the viability of downstream agreements in Central Asia. However, Afghanistan hasn't been included in any of the regional Central Asian water management strategies; on the contrary, they have been excluded from negotiations because Central Asian states fear losing out on pre-existing Soviet-era water allocations.

The end of the Afghanistan war will not necessarily stop the flow of refugees from Afghanistan into the region and any new exodus will impose significant burdens on impoverished and multi-ethnic Central Asian states. This in turn could trigger further conflicts over local water use and arable land.

Furthermore, both of the above are inextricably linked to the drugs trade, because food production requires more water than poppy cultivation. Therefore, flows of drugs, water and refugees across porous borders are regional problems that demand regional solutions. The US should therefore continue to support regional institutions such as the CAEC, which can serve as a coordination mechanism over economic, security and water issues in the region.

5. The Chu Talas Basin Agreement

Wegerich, K., 2008, 'Passing over the conflict. The Chu Talas basin Agreement as a model for Central Asia?', in Rahaman, M.M. and Varis, O. (Eds), *Central Asian Waters, Water and Development Publications*, Helsinki University of Technology, Helsinki, pp.117-131
http://www.water.tkk.fi/English/wr/research/global/publications_central-asia.html

This paper examines the case of the Chu-Talas basin agreement between Kazakhstan and Kyrgyzstan, which was celebrated by the international community as a major breakthrough for water management in Central Asia. It questions whether this agreement can be used as a model for resolving problems in other Central Asian rivers.

Data presented in this paper shows that, after independence, Kyrgyzstan always fulfilled its water supply obligations to Kazakhstan as determined in Soviet-era agreements. However, Kyrgyzstan did change the operation of the Kirov reservoir (e.g. by changing the timing of peak water

releases), which ultimately led to reduced amounts of water available for irrigation and therefore increased pressure on downstream agriculture in Kazakhstan.

It could therefore be argued that Kyrgyzstan utilised its strategic upstream position to press Kazakhstan into sharing the operation and maintenance costs of the Kirov dam. However, whilst Kazakhstan began contributing to maintenance costs in the late 1990s, the operation of water flows as had existed during the Soviet period was not reinstated. Therefore, it is too early to celebrate this agreement and the real success is not in basin cooperation, but rather in upstream hegemony.

6. Additional information

Author

This query response was prepared by Shiv Bakrania s.k.bakrania@bham.ac.uk

Contributors

Kai Wegerich, IWMI-Tashkent

Dr. Claire Wilkinson, Centre for Russian & East European Studies, University of Birmingham

Oliver Olsson, Water Resources Management, Leibniz Universität Hannover

Brian Lucas, GSDRC

Websites visited

Environment and Security, Eurasian Development Bank, Helsinki University of Technology Water and Development Research Group, Institute for Public Policy Kyrgyzstan, International Crisis Group (ICG), International Institute of Social Studies, Interstate Commission of Water Coordination of Central Asia (ICWC), Stockholm International Water Institute, UNDP Water Governance Facility, UNESCO, WaterWiki.net, WorldBank,

About Helpdesk research reports: Helpdesk reports are usually based on 2 days of desk-based research. They are designed to provide a brief overview of the key issues; and a summary of some of the best literature available. Experts are contacted during the course of the research, and those able to provide input within the short time-frame are acknowledged.

Need help finding consultants?

If you need to commission more in-depth research, or need help finding and contracting consultants for additional work, please contact consultants@gsdrc.org (further details at www.gsdrc.org/go.cfm?path=/go/helpdesk/find-a-consultant&)