

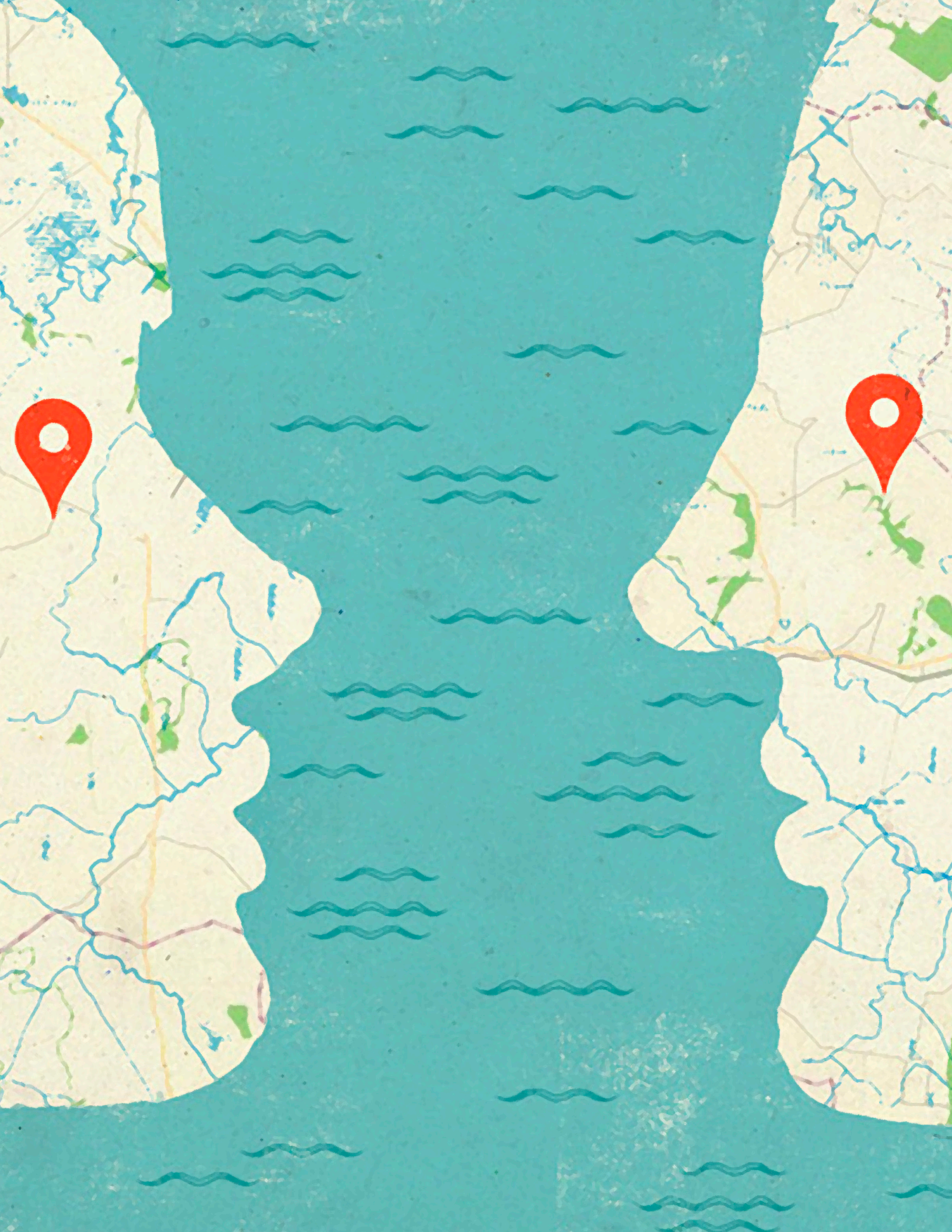


Triggering Cooperation Across the Food-Water-Energy Nexus in Central Asia

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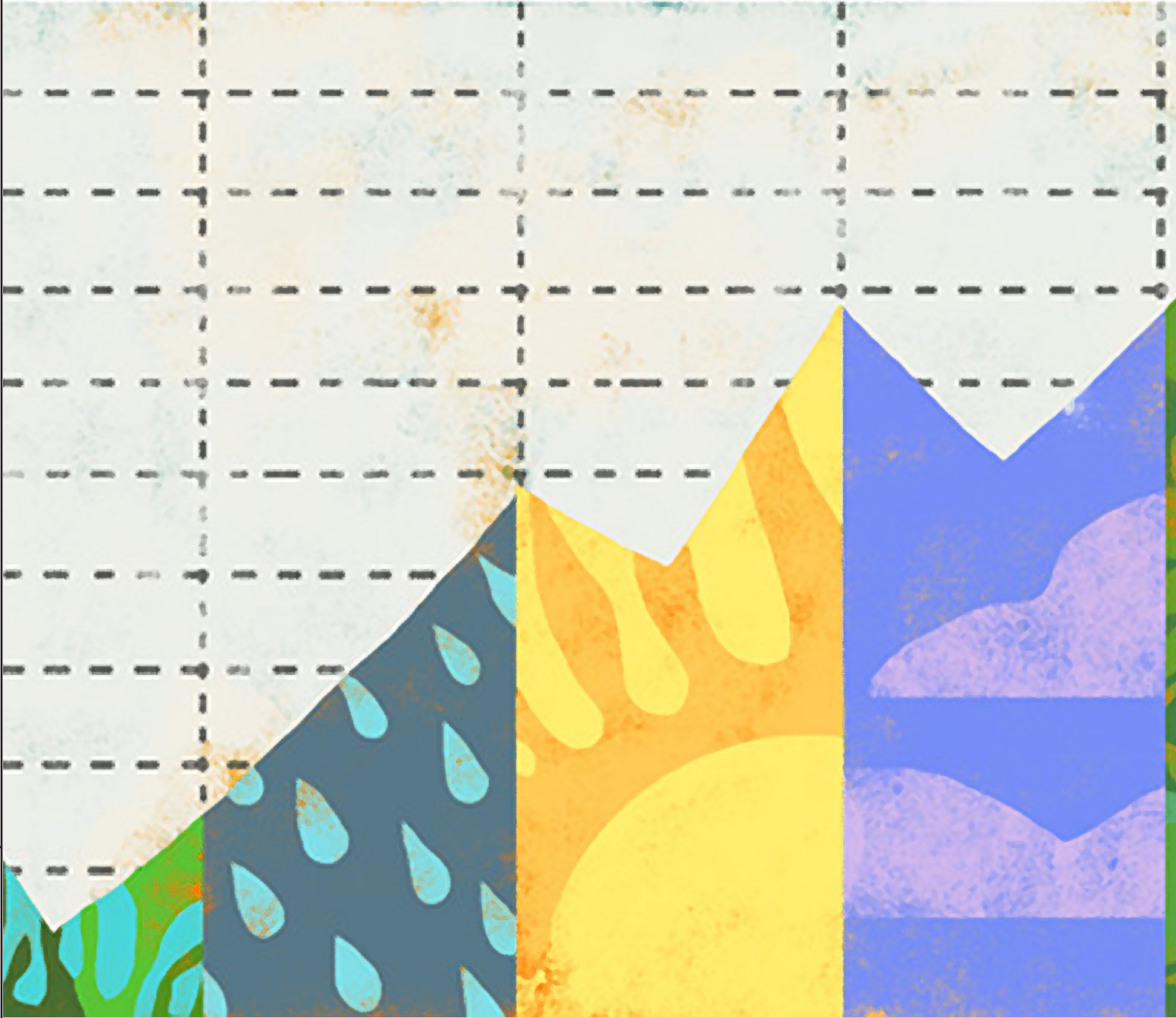
Event Report

December 2014



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Introduction

This paper is a report on *Triggering Cooperation Across the Food-Water-Energy Nexus in Central Asia*, a workshop convened by the International Union for the Conservation of Nature (IUCN), the International Water Association (IWA) and the EastWest Institute (EWI). This meeting, held on July 15-17, 2014, in Istanbul, Turkey, brought together over 50 experts from the Central Asian region and from the international community, to discuss integrated resource challenges in the Amu Darya basin, and to develop potential solutions to address these challenges. Outcomes of the workshop included five individual Nexus Action Plans, which addressed identified problems with fully-fledged project proposals.

The report is structured as follows: section two provides an overview of the countries abutting the Amu Darya River, including Afghanistan, focusing in particular on natural resource management issues within their overall development context. Section three outlines the structure and methodology of the workshop and situates the meeting in the context of other Nexus Dialogues convened by IUCN and IWA as well as prior work by the Amu Darya Basin Network. Section four and five reflect the flow and outcomes of the workshop proceedings, respectively dedicated to problem identification (Day 1) and solutions (Day 2). Section six presents the Nexus Action Plans in the form of detailed project proposals elaborated with specifics on funding, potential partners and ways to move forward. This section also presents the opinions of a high-level panel, which evaluated these Nexus Action Plans and spoke on sustainability issues more broadly. The report concludes with information on necessary next steps.

Outcomes of the workshop included five individual Nexus Action Plans, which addressed identified problems with fully-fledged project proposals.

Regional Overview Including Nexus Issues in Central Asia

Current challenges will likely be aggravated by emerging problems—in particular, climate change.

The Amu Darya River Basin

The Amu Darya is the longest river in Central Asia (2,540¹⁰ km), and is crucial to the livelihoods of the approximately 50 million people who live in its basin. Fed by glacial streams from Tajikistan, Afghanistan and Kyrgyzstan, the Amu Darya flows northwest through Uzbekistan and Turkmenistan towards the Aral Sea. Beginning in the Pamir-Alai and Hindu Kush mountains, the Amu Darya basin contains upstream mountainous ecosystems, downstream arid deserts and grasslands at lower altitudes. Once a key component of ancient Silk Road trade routes, the region continues to be of great geopolitical importance today due to a variety of factors including its rich endowment with natural gas and oil resources and its strategic positioning in the heart of Asia, in close proximity to both regional and global powers and conflict-affected states, notably Afghanistan.¹

Since the collapse of the former Soviet Union, the four Central Asian riparians have experienced mixed progress in implementing gradual transitions to reform and democratization and achieved varying degrees of success in promoting inclusive social and economic development. On the Human Development Index (HDI)—a summary measure for assessing long-term progress in three basic dimensions of human development: a long and healthy life, access to knowledge and a decent standard of living—all four republics feature in the “medium human development” category.²

Additionally, the four Central Asian riparians score in the bottom rankings of Transparency International’s 2013 Corruption Perception Index.³ Notably, both Turkmenistan and Uzbekistan tied for a spot among the ten most corrupt states, and Kyrgyzstan and Tajikistan were not far behind. A recent report by the International Crisis Group (ICG) noted that the combination of these intersecting problems, including competition over water and other resources, “contribute(s) to the overall sense of political and socioeconomic disenfranchisement and instability” in the region—and manifests in armed clashes, border disputes and worsening tensions.

Intra-regional and intra-country disparities further complicate the situation. Despite notable strides since the end of its civil war⁴ in 1997, Tajikistan remains the poorest, with almost half of its rural population below the national poverty line.⁵ Additionally, Tajikistan has one of the lowest GDPs per capita among the 15 former Soviet Republics.⁶ Kyrgyzstan, which has similarly experienced a high degree of political and social unrest, has 38 percent of its population under the national poverty line, and a quarter of its working poor earn less than \$2 per day.⁷ Kyrgyzstan’s economy depends heavily on gold exports, and agricultural cash crops, such as tobacco and cotton, are grown almost exclusively for export.⁸

In contrast, Uzbekistan’s exports of copper, gold, natural gas and cotton have allowed the country to experience increased GDP growth, and its limited exposure to interna-



tional financial markets have largely insulated it against the recent global economic downturn.⁹ Similarly, Turkmenistan has experienced strong economic growth, expanding by 10.2 percent in 2013.¹⁰ The country's main exports are gas and crude oil petrochemicals, but its economy also benefits from a thriving cotton industry.¹¹ Yet everywhere, pockets of hardship persist, though precise data is often hard to come by: about 7.5 million Uzbeks lack access to safe drinking water, as do 4.8 million Tajiks and 2 million Kyrgyz.¹² Calculations derived from World Bank statistics put the number of Turkmens without access at approximately 1.5 million.

Current challenges will likely be aggravated by emerging problems—in particular, climate change. Notably, the Central Asian region is warming faster than the global average, and climate change will hit the region sooner and harder.¹³ Upstream glaciers are already experiencing an accelerating loss of ice due to warmer temperatures, and projected precipitation decreases will further aggravate conditions in the already water-stressed basin.¹⁴

Changes in water flow could negatively affect hydropower infrastructure, impacting energy generation efficiency, reservoir management and seasonal water availability,¹⁵ including for agriculture, which is a mainstay of Central Asian economies, making up more than one fourth of the GDP of Tajikistan and about one fifth of the GDPs of Uzbekistan and Kyrgyzstan, respectively. While some areas will likely benefit from longer growing seasons (northern and eastern Kazakhstan), others (western Turkmenistan and Uzbekistan) could suffer from increased water demands for irrigation as temperatures rise.¹⁶ Cyclical flooding and droughts already plague Central Asian countries, and are likely to increase with a changing climate.¹⁷

Additionally, population growth is skyrocketing. In the half-century spanning 1960 to 2010, the population increased from 14 million to approximately 50 million.¹⁸ The region expects to gain another 20 million by 2040, placing enormous demands on water and infrastructure,¹⁹ including increasingly in urban areas.

The Food-Water-Energy Nexus in the Amu Darya River Basin

The Amu Darya River Basin today offers almost paradigmatic food-water-energy nexus dilemmas. Much of this situation is rooted in historical circumstances: Soviet era resource management in the region was centrally directed from Moscow, using water quotas and energy barter deals to capitalize on an abundance of water resources in the upstream territories and a wealth of fossil-fuel resources in the downstream territories, respectively.

Beginning in the 1960s, extensive withdrawals and pollution of Amu Darya River waters, associated with upstream agriculture, contributed to the decimation of the Aral Sea. Shrunken to 10 percent of its original size, the Aral Sea is considered among the world's worst environmental crises, with severe economic and social impacts on local populations. The entire eastern part of the basin completely dried for the first time in history in September 2014.²⁰

Following the collapse of the Soviet Union, existing governance arrangements broke down, setting the stage for persistent regional tensions over resource use and allocation. While Central Asian countries formed the Interstate Coordinating Water Commission (ICWC) and signed the 1992 Almaty Agreement specifying water quotas, these frameworks have not effectively rallied participating countries around benefit-sharing in the face of substantial broader economic and political pressures.

This is true despite strong interdependencies among riparians. Upstream countries are rich in abundant water resources, while downstream countries are major producers of fossil fuel energy and agricultural crops. Kyrgyzstan and Tajikistan rely mainly on hydropower for energy, with much potential still unutilized. These countries experience serious energy insecurity; yet at a regional level, there is no shortage of primary energy resources²¹ with many gas and oil reserves located along the border between Turkmenistan and Uzbekistan, two countries that are net exporters of natural gas. Importantly, though a push for diversification in pursuit of food self-sufficiency has reduced the land area used to grow cotton, the fiber that continues to be a dominant driver of the political

economies in Central Asian.²²

The planned Rogun dam is a central conflict flashpoint in the region. The project's location is 70 km upstream of the Nurek hydroelectric dam, which currently provides most of Tajikistan's electricity, on the Vakhsh River, a critical tributary of the Amu Darya. If completed as envisioned by Tajik authorities, Rogun would be the world's tallest dam, producing an estimated 13.3 billion kWh of electricity annually.²³ To put that figure in perspective, Tajikistan produced a total output of 16.1 billion kWh of electricity in 2009.²⁴ While potentially a boon for national and regional development—with ambitions, for example, for export of excess production to Afghanistan and Pakistan—the project also portends to significantly alter the larger power balance among the fractious independent republics.¹

Originally conceived in Soviet times, its construction was interrupted by flooding, political upheaval and finally a civil war. Since 2012, only safety-related and maintenance activities have been carried out pending the completion of technical, economic, environmental and social assessment studies under the aegis of the World Bank, which released its report in September 2014.²⁵ Examining possible dam height among several issues of great controversy, such as seismic risk, the anxiously awaited study concluded that the tallest design would fall within international safety norms, subject to specified design modifications and implementation of monitoring measures. The study also found that the highest dam option would have the longest project life, and therefore would guarantee low-cost energy production for the longest period of time.

In addition, the impact assessment found that a dam built at any of the three proposed heights at the Rogun site could be operated in a way that made no changes to historical flows,²⁶ though flows would likely be reduced during the construction and filling period, which could take up to 16 years. Additionally, resettlement of households near the dam site or in the reservoir area would result in both physical and economic displacement, and

¹ Currently in planning stages, the Central Asia South Asia Electricity Transmission and Trade Project (CASA-1000) will build more than 1,200 kilometers of electricity transmission lines and associated sub-stations to transmit excess summer hydropower energy from existing power generation stations in Tajikistan and the Kyrgyz Republic to Pakistan and Afghanistan.

Upstream countries are rich in abundant water resources, while downstream countries are major producers of fossil fuel energy and agricultural crops.

would be a major impact of the dam's construction.²⁷

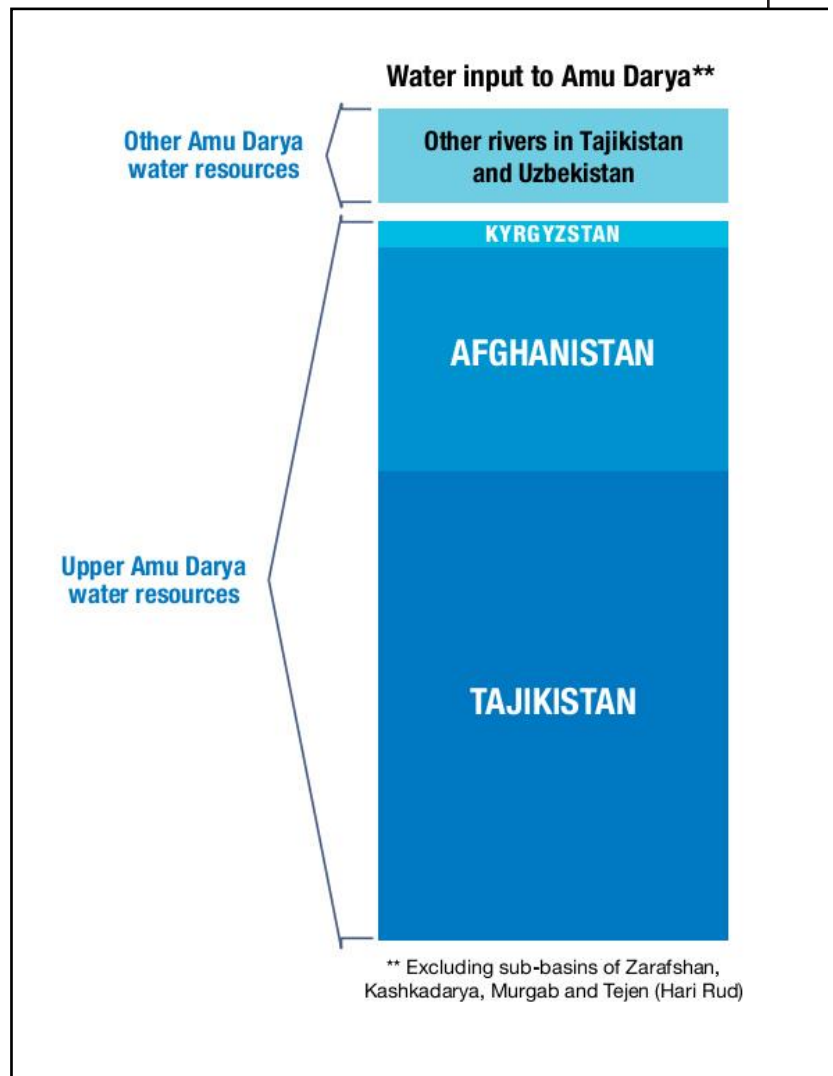
The pervasive lack of trust between Tajikistan and Uzbekistan is likely to contribute to continuing controversy around the dam's construction, and the findings of the World Bank's assessment are likely to be contested and challenged in the coming months. The results of the assessment raise additional questions that must be addressed prior to the dam's construction. For example, the issue of financing the project (the dam is projected to cost about 50 percent of Tajikistan's GDP²⁸), must be resolved before further steps are taken.

Afghanistan

More than one-fifth of the Amu Darya's flow originates from mountain streams in northern Afghanistan,²⁹ yet its resource utilization is nowhere near its contribution. This is not surprising after decades of violent conflict that have ravaged the country's social fabric, economic infrastructure and institutions. Even today, as international forces in Afghanistan transition to Afghan forces, its future lies in the balance and much of its population remains extremely vulnerable.

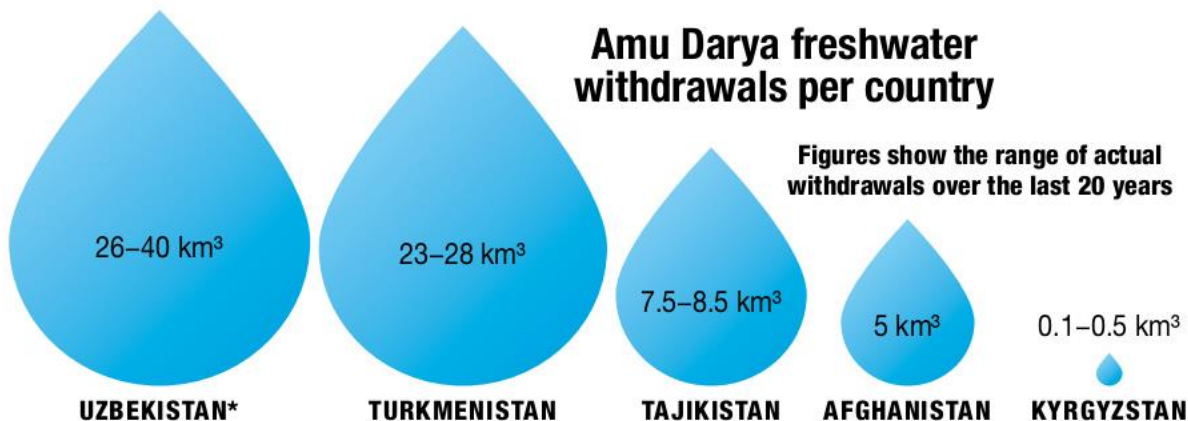
Afghanistan consistently ranks in the bottom of global development and humanitarian rankings.³⁰ Lack of resources and poor governance in the public sector result in large gaps in the provision of basic services. Only 10-15 percent of the Afghan population has access to electricity.³¹ Millions of people are seasonally or chronically food-insecure, and widespread poverty is exacerbated by frequent natural disasters, such as flooding and landslides, which strain the already fragile coping capacity.³² Not only has the conflict produced massive internal displacement of people, Afghanistan also has a large number of returning refugees as the situation appears to improve. As of 2013, 5.7 million people had returned to the country.³³

Assuming a stable political dispensation can be found, a massive economic reconstruction and development effort will of necessity focus on rebuilding the country's agricultural system. Prior to the wars, Afghanistan was mostly self-sufficient in its food supply and was renowned for its almonds, pomegranates, pistachios, raisins and apricots.



However the agricultural sector and the accompanying irrigation systems in Afghanistan have suffered from nearly a quarter century of debilitating conflict and unrest—agricultural production grew at a rate of only 0.2 percent per year during the conflict period (1978-2001), compared to 2.2 percent in the pre-conflict period (1961-1978). Currently, wheat is by far the most important crop, grown by 77 percent of households farming on irrigated land. The domestic cereal supply in Afghanistan is nonetheless usually unable to meet demand, even in good harvesting years, rendering Afghanistan dependent on wheat imports from neighboring countries to meet its food security needs.

Today, the agricultural sector contributes about 50 percent of GDP, and 80 percent of Afghanistan's population depends on agriculture for their livelihoods. In the face of man-made but also natural disasters—a semi-



*Including sub-basins of Zarafshan and Kashkadarya

Source: CA Water Info (→ www.cawater-info.net)

arid country, Afghanistan has experienced cyclical drought in eight of the past eleven years—the government has plans to undertake major upgrades of dilapidated irrigation networks to ensure reliable access to water for farmers. The rural development strategy relies on private investment and public sector support to transform agriculture in some prioritized zones, where conditions are most favorable and high value-added commercial agricultural activities can flourish. Five of these agricultural growth zones are located in northern Afghanistan, near the Amu Darya River.

Irrigation is already the largest water-consuming sector in Afghanistan (93 percent of the country's total water use). The rehabilitation of Northern Afghanistan's irrigation systems, along with their necessary expansion, has the potential to triple withdrawals from the Amu Darya from 2.1 bcm to 6 bcm.³⁴ Experts believe that substantial increases will however not occur for at least two decades, and that these are hence not likely to immediately aggravate already competitive pressures in the basin.³⁵

The long-term trend does nonetheless crystallize the importance of integrating Afghanistan into regional resource dialogues for development and security purposes. Water and agriculture—but also energy, with substantial

recent discoveries of oil and gas that have drawn the interest of outside investors,¹¹ as well as its largely unrealized hydro-generation potential (estimates exceed 23,000 MW through large, medium and small hydropower projects³⁶)—are central to the country's successful post-conflict transition, directly pointing to a greater role of Afghanistan in the future development of the Amu Darya's resources. At this stage, however, there are no working channels for the systematic integration of Afghanistan into regional water management dialogue.¹¹¹

II International interest in gas and oil tenders in Afghanistan has increased since oil and gas production began in the country. In 2011, China National Petroleum Corporation (CNPC) and Watan Oil and Gas were awarded three contracts for hydrocarbon exploration and production projects, and in 2012, a consortium consisting of Dragon Oil, TPAL and Ghazanfar Investment Ltd. were awarded two projects in the Afghan-Tajik basin. While the development of these valuable resources risks potentially increased conflict and corruption instead of development, they could also provide the much needed impetus for economic recovery.

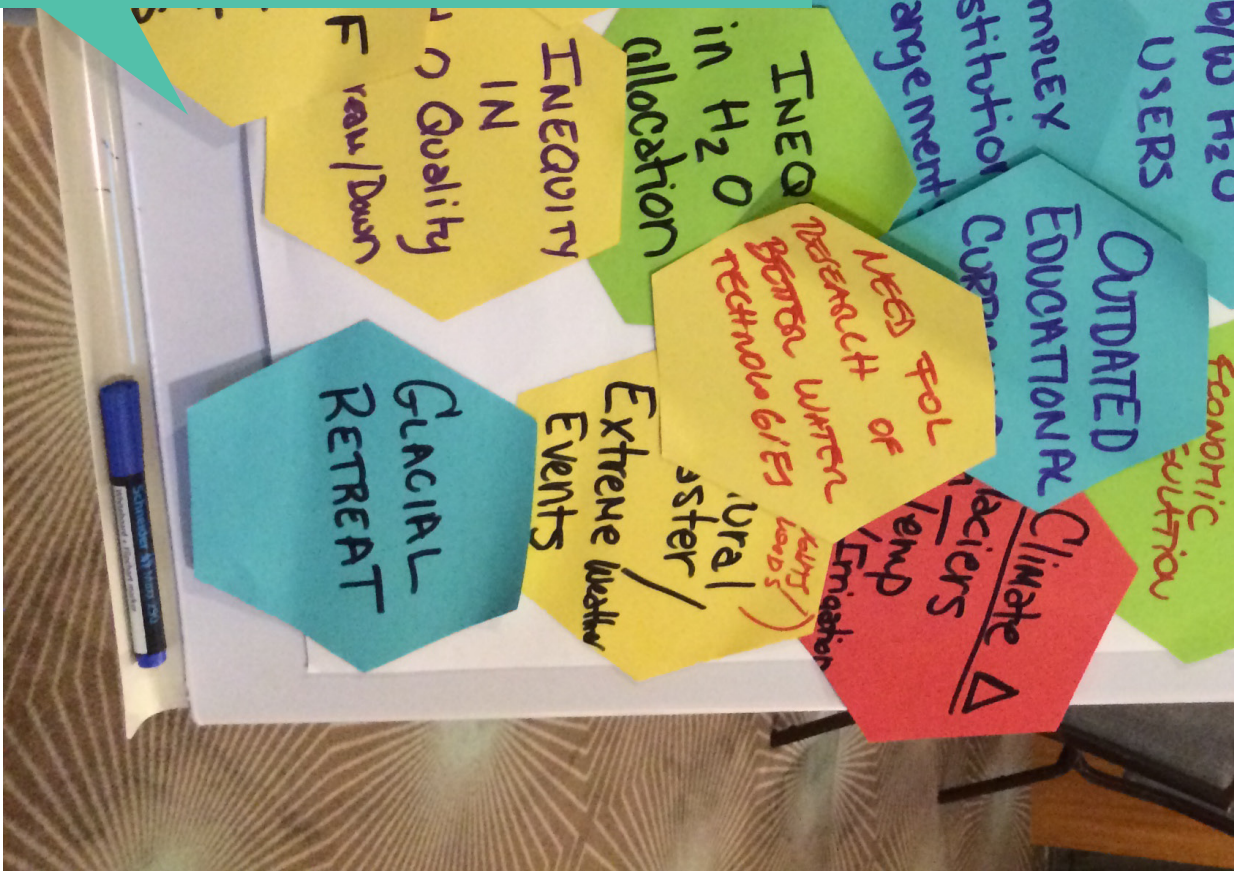
III Though approximately 20 percent of the Amu Darya's flows originate in Afghan territory, the country is not a member of the institutional frameworks established following the collapse of the Soviet Union (the 1992 Almaty Agreement, the International Fund for Saving the Aral Sea [IFAS], and the Interstate Commission for Water Coordination of Central Asia [ICWC]). Although a 1946 Agreement with the Soviet Union did allow Afghanistan to use up to 9 km³ of water per year, this agreement was not integrated into the current water-sharing framework, and due to conflict, Afghanistan has since been unable to participate in any agreements on water in the Amu Darya basin.

About Nexus Dialogues

The International Union for Conservation of Nature (IUCN) and the International Water Association (IWA) are collaborating on a two-year joint initiative to address competing water demands in river basins: The “Nexus Dialogue on Water Infrastructure Solutions” is a call to action to those leading transformations in water infrastructure planning, financing and operation, facilitating new engagements across sectors to deal with the interconnected challenges around water, energy and food/fiber production.

The Central Asia nexus workshop, co-convened with EWI, was one of a series of regional meetings dedicated to fostering an exchange among water, energy and agricultural resource managers and policy experts. It also built on the membership and experience of the Amu Darya Basin Network—an EWI-initiated platform linking over 75 local and international experts to support collaborative research, policy development and knowledge transfer to improve water management in the region.

The outcomes of this workshop, as well as three earlier ones held in Africa, Latin America and Asia, respectively, fed into the 2014 Nexus Dialogues Symposium in Beijing China, on November 11-13.





Business Challenge Series Agenda
14:00 - 14:15: Welcome and Registration
14:15 - 14:30: Keynote: The Role of the Private Sector in Sustainable Development
14:30 - 14:45: Panel Discussion: The Role of the Private Sector in Sustainable Development
14:45 - 15:00: Break
15:00 - 15:15: Panel Discussion: The Role of the Private Sector in Sustainable Development
15:15 - 15:30: Break
15:30 - 15:45: Panel Discussion: The Role of the Private Sector in Sustainable Development
15:45 - 16:00: Break
16:00 - 16:15: Panel Discussion: The Role of the Private Sector in Sustainable Development
16:15 - 16:30: Break
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17:00 - 17:15: Panel Discussion: The Role of the Private Sector in Sustainable Development
17:15 - 17:30: Break
17:30 - 17:45: Panel Discussion: The Role of the Private Sector in Sustainable Development
17:45 - 18:00: Break
18:00 - 18:15: Panel Discussion: The Role of the Private Sector in Sustainable Development
18:15 - 18:30: Break
18:30 - 18:45: Panel Discussion: The Role of the Private Sector in Sustainable Development
18:45 - 19:00: Break
19:00 - 19:15: Panel Discussion: The Role of the Private Sector in Sustainable Development
19:15 - 19:30: Break
19:30 - 19:45: Panel Discussion: The Role of the Private Sector in Sustainable Development
19:45 - 20:00: Break
20:00 - 20:15: Panel Discussion: The Role of the Private Sector in Sustainable Development
20:15 - 20:30: Break
20:30 - 20:45: Panel Discussion: The Role of the Private Sector in Sustainable Development
20:45 - 21:00: Break
21:00 - 21:15: Panel Discussion: The Role of the Private Sector in Sustainable Development
21:15 - 21:30: Break
21:30 - 21:45: Panel Discussion: The Role of the Private Sector in Sustainable Development
21:45 - 22:00: Break
22:00 - 22:15: Panel Discussion: The Role of the Private Sector in Sustainable Development
22:15 - 22:30: Break
22:30 - 22:45: Panel Discussion: The Role of the Private Sector in Sustainable Development
22:45 - 23:00: Break
23:00 - 23:15: Panel Discussion: The Role of the Private Sector in Sustainable Development
23:15 - 23:30: Break
23:30 - 23:45: Panel Discussion: The Role of the Private Sector in Sustainable Development
23:45 - 24:00: Break

Jozef Turok

Liesl Truscott
Isaac Ean

Nirai
Yu

Mun Amir



Workshop Objectives, Structure and Methodology

A first-of-its-kind meeting, “Triggering Cooperation Across the Food-Water-Energy Nexus in Central Asia,” brought together experts from all three key sectors to exchange knowledge, prioritize problem areas and jointly identify solutions, taking into account existing institutional frameworks and initiatives, as well as innovations pioneered globally and in the region and the particular operational realities in Central Asia. Fifty participants from government, international and regional organizations, academia, civil society and the private sector, informed the proceedings with technical, policy and financial expertise.

The overall purpose was to develop Nexus Action Plans for strategic investments in integrative solutions for water, food and energy security. More specifically, the workshop aimed to support participants in:

1. Gaining an understanding of how to combine and apply best practices on water-energy-food nexus approaches for solutions in river basins.
2. Motivating participants to take practical steps toward implementing water, energy and food nexus planning and practices in the Amu Darya River Basin.
3. Exploring new avenues for advancing hydro-diplomacy in Central Asia, in light of the profound transition in Afghanistan, whose agricultural and hydrocarbon resources will play a key role in post-2014 economic reconstruction efforts.

Fifty participants from government, international and regional organizations, academia, civil society and the private sector, informed the proceedings with technical, policy and financial expertise.

The Nexus Realities: From Global Paradigm to Action in Amu Darya River Basin

“The river is probably the most important economic asset in this entire region, and we don’t treat it as an asset. We treat it as a resource that has no value assigned to it.”

**Gary
Lawrence**
CHIEF SUSTAINABILITY
OFFICER, AECOM

The Amu Darya is a key lifeline for the people and economies of Central Asia. Sustainably leveraging the region’s rich natural resource base is crucial to the economic and social renewal of the states of Central Asia and Afghanistan. Necessary progress in the collaborative management of these resources has been inhibited by enduring challenges in the energy, water and agricultural sectors. The first day of the proceedings were dedicated to building a common understanding of the emerging nexus concept and its various implications and applications, as well as to jointly identify high-priority nexus problems in the specific context of the Amu Darya basin.

The workshop began with the Basin Challenge Game^{IV}, an online exercise simulating the development over the course of 50 years of a theoretical river basin shared by two neighboring sovereigns. Posing a series of land use and infrastructure choices and visually illustrating the profound impacts of these on the long-term sustainability of both riparians, the game highlighted the interrelationships within and across sectors and geographic boundaries. In the game—as in real life—clear and consistent communication emerged as essential to maximize co-benefits and minimize trade-offs.

^{IV} Developed by Nathaniel Matthews in coordination with King’s College, <http://thebasinchallenge.com/playgame.php>

“We should have at the beginning benefited from talking to our neighbors,” reflected one participant, whose group found it had to reassess its entire development strategy. The group realized that its initial investment choices, heavily driven by short-run profit maximization criteria, left a legacy of environmental and social problems in later decades.

Moving from the virtual sphere to the day-to-day realities in Central Asia, a series of presentations provided an up-to-date picture of the dynamics, and institutional frameworks shaping the production, use, and governance of essential resources in the Amu Darya basin. Regional and international experts identified regional trends, highlighted persistent challenges and commented on possible opportunities for cooperation across the nexus.

Building on the presentations, which provided a macro-level overview, participants subsequently worked in small groups, using the PESTLE framework (policy, economic, social, technical, legal and environmental problems), to identify concrete nexus challenges in the upper and lower part of the Amu Darya Basin, as well as from a wider regional perspective. A broad sweep of issues emerged, ranging from land degradation and a recurrent energy crisis in the Upper Amu Darya to insufficient investment in key resource infrastructure and management capacity, as well as political barriers in the Lower Amu Darya.

From among the dozens of problem areas flagged, four overarching themes recurred consistently across all working groups:

Data Availability and Lack of Trust

A major problem in the region is a lack of trust between riparian countries. Specifically, the lack of progress on data exchange has prevented the establishment of a comprehensive hydro-meteorological system, without which rational allocation of resources cannot be achieved. While many different networks for data exchange exist (see UNECE publication for a complete list of ongoing data initiatives³⁷), reliable information about the environment, and in particular water resources is not currently available in a consolidated and credible platform. Problems with the current data systems include: low capacity for collecting and managing high-quality data; deteriorating monitoring networks; lack of political will to enable regular information exchange; insufficient budgets for maintaining data networks; a perception that regional data is politically biased, and information sources have no incentive to provide outside organizations with improved data.³⁸ Particularly, lack of trust in regionally collected , as opposed to national data, has aggravated these problems.

Victor Novikov, project manager at Zoi Environmental Network, highlighted some of the most acute nexus problems today in the Amu Darya River Basin. The Golden Age Lake project aims to carry agricultural runoff from irrigated fields in Turkmenistan to a remote desert location. Supporters believe that this will reduce runoff that is contaminated with fertilizers and pesticides, flowing back into the Amu Darya, thereby contributing to improving the health of the river. Opponents maintain that the arid desert climate will cause most of the water, already contaminated with pesticides and fertilizers, to evaporate before reaching the lake, leaving behind a toxic combination of chemicals. Still others worry that additional flows will be diverted from the Amu Darya to fill the lake, a prospect that raises objections from other riparians.

Chronic energy deficits and recurring food crises are serious problems in Tajikistan. Novikov pointed specifically to the compound crisis beginning in winter 2007-2008, when extremely cold temperatures led to widespread blackouts. The severity of the temperatures (-15°C in towns and -25°C in the countryside) caused great damage to the water and electricity system in a country which receives about 98 percent of its energy from hydropower.⁴² This reduced the country's resilience to locusts and droughts in the following months, which killed crops and livestock, and in turn contributed to a national food crisis, with two million Tajiks unable to access food either because of shortage of supplies or because of high food prices.⁴³

Tajikistan's government has proposed the construction of the Rogun dam, a project originally conceived of by the Soviet Union. The dam would be the highest dam in existence, and would almost double Tajikistan's current energy generation, at the cost of at least \$3.6 billion USD. This project has raised strong objections from downstream countries on the grounds that the dam would further limit their ability to control their water resources, and could upset downstream agricultural systems—especially during the dam's construction phase, projected to take a decade or longer.

**Meeting
Highlights**

Water, agriculture and energy are central to a successful post-conflict transition, pointing to a greater role of Afghanistan in the future development of the Amu Darya's resources.

Low Water-Use Efficiency

Lack of reliable and consistent data exchange and other drivers, such as poor irrigation infrastructure practices and a lack of investment in new agricultural and irrigation practices and technologies, have led to low water-use efficiency in riparian countries. The region's irrigation networks were largely built between the 1950s-80s without any significant upgrading, with income generated by large-scale agriculture allocated to other national investments as a form of cross-subsidy.³⁹ Because of problems ranging from deteriorating irrigation networks, to changing evaporative rates due to a changing climate, more than 50 percent of irrigation water is lost before it even reaches the fields.⁴⁰

Climate Change

Water availability will be affected by climate change, which threatens to decrease flows as average temperatures increase and upstream glaciers retreat. Additionally, increased uncertainty and frequency of extreme events due to climate change could create further pressures on an already fragile system. Flooding or drought due to climate change could negatively impact agricultural productivity, hydropower production and the availability of water resources in the region.

For example, the particularly dry summer of 2008 led to rising food prices in Tajikistan, creating a humanitarian emergency affecting two million people and forcing the country to significantly increase grain imports from Russia and Kazakhstan.⁴¹ While the international community provided food aid to alleviate the immediate problem, chronic food shortages are likely to continue to plague the region, as a result of increasingly frequent and severe droughts.

Incorporating Afghanistan

It is highly desirable to include Afghanistan—beyond current bilateral efforts involving Tajikistan—in transboundary discussions on resource management. Though approximately 20 percent of the Amu Darya's flows originate in Afghan territory, the country is not a member of the institutional frameworks established following the collapse of the Soviet Union (the 1992 Almaty Agreement, the International Fund for Saving the Aral Sea [IFAS], and the Interstate Commission for Water Coordination of Central Asia [ICWC]). Yet water, agriculture and energy are central to a successful post-conflict transition in the country, pointing to a greater role of Afghanistan in the future development of the Amu Darya's resources.

Meeting Highlights

Munira Aminova, assistant professor at Vrije Universiteit in Brussels, highlighted political, economic and social changes that took place in Central Asian countries after the Soviet Union collapsed. Poverty and unemployment remain significant, and bound up with nexus-related issues: for example, while Tajikistan aims to reduce poverty to 41.5 percent by 2015, this goal might be too ambitious, considering winter-energy shortages, increasing unemployment, deterioration of sanitation, and the prevalence of malnutrition. Additionally, Aminova touched on differences in demographics and types of governance, including levels of political stability, voice and accountability, amongst Central Asian countries as a way to explain discrepancies in their respective development agendas and actions.

Pointing to some of the root causes and emerging threats affecting resource security in the region, **Rieks Bosch**, consultant with EcoCoast Consultancy, argued that Central Asia suffers from a lack of water-use efficiency, rather than scarcity. In a comparison with other water stressed areas, Bosch noted that water use per capita in Central Asia is 20 times greater than, for example, in Israel. Water efficiency is worst in the agricultural sector, largely due to neglected irrigation infrastructure, outdated technology, and inadequate monitoring and data, exacerbated by fragmented institutional mandates for water management and low levels of trust between riparian states. In terms of solutions, the move towards better resource management can be achieved through data and information exchange and transparent communications. Practical management of resources is needed beyond politics.

Meeting Highlights

Mapping Nexus Solutions for the Amu Darya River Basin

Many ongoing initiatives exist to address enduring nexus challenges in Central Asia, and any effort to mobilize solutions needs to take account of this rich experience. Lessons learned from other parts of the world can also provide ideas and insights, if appropriately modified to fit the particular regional context. The proceedings on Day 2 were devoted to highlighting different types of initiatives and solutions promulgated by a wide variety of actors, both locally and globally, in order to inform the subsequent process of collaboratively crafting nexus solutions. Key supporting documentation for this exercise included a recent report from the World Business Council on Sustainable Development (WBCSD), *Co-optimizing Solutions: Water and Energy for Food, Feed and Fiber*, as well as a compilation of relevant existing institutional activities and frameworks for cooperation.

Presentations on Day 2 highlighted specific, innovative and potentially scalable solutions addressing the interconnected water, energy and food challenges in a variety of ways and contexts. Experts from the public and private sectors, specializing in large-scale infrastructure design, energy and fiber/food production respectively, provided examples of successful initiatives and highlighted enabling conditions as well as barriers encountered in their execution. Representatives from research and intergovernmental organizations presented initiatives based on specific mod-

els of cooperation at both the local and basin levels. Technological and institutional shifts were emphasized, including with respect to the potential of organic cotton and irrigation. Both new and ongoing programs were among the case studies introduced.

Moving from problem identification on Day 1 to the prioritization of problems and then the matching of these with potential solutions, participants worked in the same small-group configurations (upper basin, lower basin and regional groupings). Individual groups jointly crystallized the most acute problems areas and then brainstormed a comprehensive menu of more than 80 suggested interventions that would address different aspects of the nexus conundrum as it manifests itself in the Central Asian context. Not surprisingly, the same themes that dominated on Day 1 reemerged in deliberations on the solution space in Day 2:

Data Availability and Lack of Trust

Prominent among proposed solutions was the creation of some sort of information-sharing mechanism or platform, or the rehabilitation of an existing data-sharing network. Additionally, workshop participants agreed that establishing regional guidelines for the monitoring and assessment of water quality and water governance was necessary in or-

“The nexus is still in its early stages in the region. It is time to develop dynamic and concise, local level, solution oriented tools and instruments for the food-water-energy nexus.”

Iskandar Abdullaev

EXECUTIVE DIRECTOR,
THE REGIONAL ENVIRONMENTAL CENTER FOR
CENTRAL ASIA (CAREC)

Meeting Highlights

Iskandar Abdullaev, executive director of the Central Asia Regional Economic Cooperation (CAREC), emphasized institutional and political barriers. Following the collapse of the Soviet Union, newly independent Central Asian nations prioritized domestic food, water and energy security to the detriment of basin-wide resource management. Even at the national level, management of water, energy and agriculture remains almost exclusively sector based. Consequently, the nexus can be used as a tool for conflict resolution as well as development.

Abdullaev argued for the need to adopt bottom-up, local-level solutions advanced by local champions. Abdullaev noted that while the nexus approach has been broadly promoted by international organizations, the lack of specific nexus projects and concrete solutions on the local level has the potential to hamper progress. There are institutions that exist to champion action especially at the local level, for example ones that support expanding drip irrigation to save energy.

der to harmonize approaches between different information-collecting bodies. One group added that additional standards on glacial retreat, glacial melt, and precipitation were necessary to improve data availability and analyses. Building data-collecting capacity, through increased installation, RS data and analysis was also proposed as a way to improve the quality of data available.

Low Water-Use Efficiency

Training centers and information networks were another area of focus in order to improve knowledge surrounding high water-efficiency technologies, techniques and practices. Increased investment in rehabilitating water infrastructure was proposed; specifically investment that focused on small, local-level projects was prioritized. Incorporating rehabilitation costs into infrastructure projects early-on, rather than rehabilitating projects ad hoc, would also go a long way in improving the life of a project. Empowering farmers and water users by strengthening extension services for irrigation and horticultural practices would also provide incentives for small-scale farmers to use water more efficiently.

Spotlighting the particular circumstances of Afghanistan, **John Shroder**, a professor at University of Nebraska at Omaha, highlighted the importance of including the country in regional resource-use agreements given that 21 percent of the Amu Darya's flow originates from the country's mountain streams.⁴⁴ The major international treaty governing water withdrawals on the Amu Darya is based on a Soviet era division, which did not include Afghanistan. Afghanistan today only diverts about 2 bcm annually⁴⁵ from the Amu Darya River, but as more than three-quarters of the Afghan people live in rural areas where agriculture is the primary activity, rehabilitation of old and dilapidated irrigation systems, as well as planning and building of new irrigation infrastructure should be national priorities.⁴⁶ Nonetheless, Shroder stressed that, despite any geographic advantage as an upstream riparian that Afghanistan may hold, in practice the longstanding conflict has vitiated its capacity to actively participate in the governance of water resources in the basin and effectively leaves it with little control.

Climate Change

In order to combat the potentially devastating effects of climate change, groups proposed projects that would restore mountain ecosystems through afforestation schemes and energy diversification aimed at reducing deforestation and regulating water resources upstream. Furthermore, improved communication and education of the impacts of climate change on states and the private sector would incentivize mitigation and adaptation. Finally, integrating climate impacts, including water and energy-related ones, in development plans and project proposals would reduce climate vulnerability of public and private undertakings.

Incorporating Afghanistan

In order to include Afghanistan in future dialogues, groups proposed regional and donor assistance programs promoting increased communication between Central Asian countries and Afghanistan as well as capacity building for Afghan water managers at various levels. Other groups incorporated mechanisms into their proposals that would involve Afghanistan in the project steps, allowing for Afghanistan's increased involvement as economic reconstruction took place.

Nexus Action Plans: Mobilizing Nexus Solutions for the Amu Darya River Basin

Meeting Highlights

Starting from the broad menu of options from Day 2, a voting exercise narrowed the field to a small number of solutions collectively deemed most viable and catalytic. It was these potentially high-impact interventions that participants developed into five different Nexus Action Plans—moving to Day 3—from the kernel of an idea to the elaboration of as much detail as possible in the design of realistic and economically viable projects.

Participants were guided in this endeavor by a presentation by Delcho Vitchev, director of Renaissance Finance International Ltd., who summarized the key parameters and characteristics of successful project proposals, based on a resource guide published by his organization. Components of the Nexus Action Plans included details on key steps, including the mobilization of stakeholders and resources, as well as potential barriers and obstacles. Additionally, participants examined risks and benefits of their projects, possible funding sources and partners in order to encourage the long-term viability of these projects.

The five final Nexus Action Plans incorporated: knowledge of the interconnected problems between water, energy and food/fiber production; an extensive and far-reaching

menu of solutions from which to draw upon; lessons learned from previous and currently ongoing regional initiatives and from both upper and lower basin perspectives; and funding conditions required for long-term project success.

In the final workshop session on Day 3, a panel of private and public sector experts vetted and critiqued the Nexus Action Plans and drew connections to broader sustainability issues. The panel was composed of a mix of workshop participants representing a diversity of institutional interests: Iskandar Abdullaev, executive director of the Regional Environmental Center for Central Asia (CAREC), Gary Lawrence, chief Sustainability Officer of AECOM and Jenniver Sehring, environmental affairs adviser for the Organization on Security and Cooperation in Europe (OSCE). They were joined by two Istanbul-based business leaders: Mustafa Baltaci, general secretary of the Federation of Euro-Asian Stock Exchanges, and Mehmet Tiryakioglu, board member of Tiryaki Agro Foods Industry Co.

Panel members highlighted the quality of in-depth analysis of many of the project proposals and particularly commended participants for recognizing the most intractable problems that plague the region. Members praised participants for creatively address-

“Your banker is not your adversary, you work together to make the project successful, because then both parties will benefit.”

**Delcho
Vitchev**

DIRECTOR,
RENAISSANCE FINANCE
INTERNATIONAL LTD.

Gary Lawrence, chief sustainability officer of AECOM, emphasized that a fundamental shift in mind-set and approach will be required to safeguard the security of the region. He laid out three criteria for solutions to gain traction: they must be technically feasible, economically viable and politically acceptable.

Elaborating on these, he emphasized the importance of local knowledge and contexts in developing potential solutions, and warned against what he termed the “tyranny of experts,” identified as people who resist change in the face of evolving scientific understanding and innovation. Lawrence noted that to encourage more rapid change, local knowledge can complement and improve technical and scientific assessments and help devise solutions that are consistent with local needs, traditions and history. Without “permission” from society, he said, potential solutions are unlikely to take root.

Meeting Highlights

Pilot programs are currently being carried out by the International Water Management Institute (IWMI) in the Ferghana Valley. Although these projects focus on water management on the Syr Darya River, **Jusipbek Kazbekov**, a researcher at IWMI, argued that lessons learned from these pilot projects on small transboundary streams (STSs) can be used to generate river-wide institutional arrangements.

Kazbekov emphasized that local context and flexibility to adapt to local conditions were extremely important in ensuring initial project success. Promoting long-term and systemic cooperation, rather than a “one-off” agreement, was another key to success. With these learning experiences in mind, Kazbekov advocated for solutions linked to existing regional frameworks, and argued that solutions should be grounded in local contexts and equipped with flexible adaptation mechanisms. Finally, Kazbekov spoke strongly that donor-funded projects are valuable, but need to be better coordinated to prevent both overlap and oversight.

Meeting Highlights

ing these problems with their Nexus Action Plans.

The panel highlighted how the proposed initiative of strengthening regional economic integration (Group 3)—envisions action at both the political and local level, citing that action pushing for change simultaneously from above and below have a greater chance of success. Capacity building is key for institutional change, and the proposed approach of establishing a network of training centers would improve irrigation and agricultural practices and would provide training services. The lack of institutional capacity is a key barrier to private sector engagement in the region, and that improving institutional capacity in Central Asia and Afghanistan could increase private sector involvement as both a solution provider and an investment catalyst. Implementing payments for ecosystems services in a basin (Group 1) needs to demonstrate clear incentives. For this to be implemented at a transboundary level, there would need to be a regional compact agreement for protecting water quality. Starting on a smaller scale is more manageable and there are initiatives in place (e.g. CAREC). For policy makers to be on board, there does need to be evidence through pilot initiatives, and a clear mechanism to guide them in how to take pilots to the national and regional levels.

Sharing of information is a constant challenge, which could be addressed through the proposed Integrated Basin Wide Information System (Group 2). However, political commitment needs to be in place as well as trust on how data is used. This could be enhanced through the creation of a network of knowledge centers focused on sharing best agricultural and irrigation practices (Group 4 and 5). Securing funding for this type of project is typically difficult, especially as analogous efforts already exist but are not necessarily successful. In general, projects should build on existing programs and initiatives, rather than re-inventing the wheel.

Duplication of efforts emerged as a common risk factor to implementation across the presentations of the Nexus Action Plans and the reflections by the panel. Multiple regional and national initiatives already tend to create policy fragmentation, and competing mandates make projects difficult to manage. Lack of funding also emerged as a key theme.

[\[Continues on page 29\]](#)

Group One: Payment for Ecosystem Services

Upstream decisions can impact the quality and quantity of water resources. This proposal would require downstream countries to participate financially in protecting upstream water sources. This plan would require upstream and downstream countries to share costs, and in effect, would create a system of payment in exchange for ecosystem service provision.

Initially each country in the Amu Darya basin will have a pilot project in a defined sub-basin. The pilot project will focus on developing a Payment for Ecosystem Services scheme in the middle and downstream areas of the basin. The funds from pollution payments will be invested locally to improve agricultural technology and practices in each sub-basin. Indicators will include measuring salinization in the downstream part of the basin and sediment load in the upstream area. The funds will also be used to monitor water and identify major polluters.

I. Problem Addressed

Limited cooperation between upstream and downstream riparian countries, upstream decisions impact the quality and quantity of downstream water resources

II. Solution

By 2030, ensure that downstream users participate financially in protecting upstream water resources through cost-sharing and/or payment for ecosystem services

III. Timeline – Long term vision

By 2020:

- 1) Compile existing international experience
- 2) Training on PES approaches
- 3) Define each country's demand for water
- 4) Development of scenarios which shows costs of no action
- 5) Pilot projects: adopt water quality standards, estimate costs, determine willingness to pay, identify basin indicators for monitoring

By 2025:

- 1) Development of water funds
- 2) Pilot activities in sub-basin: Select smaller riv-

- ers to introduce concept
- 3) Separate projects for upstream, midstream and downstream parts of the basin
- 4) Demonstrate benefits (through pilot activities) of investing in ecosystem services
- 5) Dialogue on willingness to pay
- 6) Development of monitoring system, including laboratories and satellite imagery, plus community monitoring

By 2030:

- 1) Scaling up= negotiation across countries involving all stakeholders
- 2) Regional Amu Darya Strategy (includes benefits, possible future scenarios)
- 3) Matrix of actions across water, energy and food
- 4) Identify separate projects for investment at the transboundary level

Timeline for pilot projects:

Year 1- 2:

- Adoption of water quality standards by sector (acc. EU, UNECE, FAO)
- Estimate costs of achieving quality standards
- Determine willingness to pay
- Incorporate existing

systems of polluter pays into the project

- Identify basin indicators for monitoring

Year 3-4:

- Restoring of water cadaster on national levels
- Development of monitoring system, incl. laboratories and satellite imagery, plus community monitoring
- Pilot activities in sub-basins in each country

Year 5:

- Extend monitoring beyond the pilot activities so to be able to extend beyond the project lifetime

IV. Estimated Funding Requirement

- €3,670,000 per country
- €900,000 training with information system
- €1 million for monitoring
- €400,000 social mobilization
- €300,000 demonstration projects
- 40% overheads

V. Obstacles

- No documents to guide transboundary water use
- Lack of trust between countries and institutions
- Centralized decision making

VI. Partners

- WUAs, drinking water communities
- Water utilities
- Agricultural water users
- National agencies responsible for water quality
- BVO Amu Darya or national IFAS branches
- Industrial water users
- Group with Center for Excellence (group three)

VII. Benefits

- Improved water quality for different uses
- Downstream users save cost of drinking water treatment
- Life extension of reservoirs because of reduced sedimentation
- Improved energy production
- Polluters have access to loans if they are part of the scheme

VIII. Risks

- Project adds burden on farmers as they may have to adjust farming practices to reduce contamination of water bodies
- Targeted spending of money—funds go to state
- Bureaucracy, long time needs for procedures
- State is forcing farmers to farm on land that results in pollution

Group Two: Building an Integrated Basin-Wide Information System

In order to improve cooperation between upstream and downstream countries, a system is to be created for strengthening information exchange and cooperation at the regional and national levels. The ultimate goal of this program would be to achieve a fully transparent, harmonized and up-to-date integrated basin-wide information system on natural resource use, including Afghanistan, by 2030.

The program would establish hubs and networks for ongoing information exchange, building on current negotiations hosted by ICSD and ICWC, to agree upon the scope and methodology for data collection, management and dissemination. Additionally this program would aim to harmonize data systems and capacity building packages. The final end-product would provide public accessibility with capacity for updating, and would make available high-quality data required for effective resource allocation and use decisions.

Action Plan

I. Problem Addressed

Limited cooperation between upstream and downstream riparian countries, upstream decisions impact the quality of downstream water resources

II. Solution

By 2030, strengthen information exchange and cooperation mechanisms at regional and national level to achieve a fully transparent, harmonized, up-to-date, integrated, basin-wide information system on natural resource use, including Afghanistan

III. Steps/Timeline:

By 2015:

1) Develop a consensus on the goals of the program, on the concept of information systems, and on the requirements by country

By 2017:

1) Scope of data and methodology established
2) Build national and sectoral systems in compatible way (env't agreement hydromat)
3) Establishment of network

By 2020:

1) To degree necessary, harmonization of data systems
2) Delivery of harmonized capacity building packages

By 2025:

1) National hub system is in place
2) Capacity building ongoing

By 2030:

1) Public accessibility
2) Capacity for updating
3) Transparency and usefulness of data
4) High quality data, linked with global data systems

IV. Estimated Funding Requirement:

• Setup phase

(2015-2020) costs

per year

- One hub per country plus six regional hubs, \$1.2 million
- Data transfer and communications costs \$300,000
- Capacity building technical partners \$1 million
- Capacity building social partners \$500,000
- Building institutional interest and ownership \$300,000

• Execution Phase (2020-2030)

- Operation costs \$150,000 per country/per year
- \$1 million at national level and \$300,000 at regional level
- Ongoing capacity building \$250,000/year minimum

V. Obstacles:

- 2 draft negotiation texts on a regional data system (ICSD and ICWC) need to be merged/unified
- Sustainable funding
- Institutional competition
- Hesitation about data provision/compliance
- Mobilization of int'l and national resources
- Technical and management capacity
- Info availability at national/sub-national level
- Intra-governmental coordination
- Key data not publically available
- Language

VI. Partners:

- Riparian states
- EC-IFAS, ICWC, SIC-ICWC
- BWO (Amu Darya & Syr Darya)

• CAREC

- GWP
- Regional Hydrological Center
- USGS, NASA, European Space Agency
- World Bank, SDC, GIZ, EU
- UNDP, IHP-UNESCO, FAO, UNECE, UNEP
- NGOs and Civil Society

VII. Benefits:

- Improved coordination of resource use
- Improved forecasting ability and disaster risk reduction capability
- Associated financial savings from damage prevention

VIII. Risks:

- Political commitment and low institutional capacity
- Shortage of data to be fed into the regional system
- Incompatibility of different national information systems
- Requirements for supportive national regulatory frameworks must be put in place

Group Three: Strengthening Regional Economic Integration

This program would promote the benefits of cooperation in the region, by strengthening regional economic integration. This project would advance in three phases. First it would promote the benefits of cooperation based on evidence from local examples. The second phase would attempt to establish a common energy market, which would lead to the third phase in which free trade between Central Asian countries would be established.

This project would simultaneously advance at a high political level and the local level through economic integration of border regions. Lessons learned and experiences on the local level would theoretically serve as evidence for the political track, at which political will around economic integration would be generated. To pursue these two goals, the proposal would assess benefits and costs, carry out a feasibility study, and formulate recommendations from working groups and workshops.

I. Problem Addressed

Limited Cooperation between Riparian Countries, a lack of an agro-trade agreement, and frequent border disputes

II. Solution

By 2030, promote the benefits of cooperation in the region by strengthening economic integration and development – with a view to improve natural resource management as well as human rights standard

III. Steps/Timeline:

By 2018:

- 1) Identify mechanisms for cooperation
- 2) Assess risks/benefits
- 3) Feasibility study
- 4) Formulate recommendations with possible benefit scenarios
- 5) Workshops/exercises for integration at micro-level ex local food markets and energy sharing

By 2021:

- 1) Agreement on trade

- 2) First energy market consensus

By 2026:

- 1) Implementation, integrated grid
- 2) Coordination in practice
- 3) Creation of new institutions with special energy and food trade

By 2030:

- 1) Expand agreement to common tariffs

IV. Estimated Funding Requirement:

• Startup costs (2015-2018)

- Year one: \$750,000 USD
- Year two: \$1.25 million USD
- Year three: \$1 million USD

V. Obstacles:

- How to incorporate Afghanistan into framework
- Lack of political will
- Third party interests are not necessarily aligned with individual country priorities
- Disparities in Economic Development
- Corruption

- Previous bilateral agreements in the region may be an obstacle for new negotiations that aim to address the same issues but in a broader context and integrating new countries.
- Who will be the project champion?
- Who will create incentives for implementation?
- Power dynamics/ political will
- Economic sustainability of institutions (funds)

VI. Partners:

- National Government
- Foreign governments
- Local governments
- Community
- CBO

VII. Benefits:

- Improving regional cooperation
- Improving trade between countries
- Improving energy efficiency through competition and updated grid management

VIII. Risks:

- Disagreements on implementation lead to further disintegration of cross-border relationships
- Too high reaching, not feasible
- Lack of government approval
- Resistance to change
- Energy market creates negative competition between countries

Group Four: A Network of Training Centers for Improved Irrigation Capacity Building and Service Provision

High land degradation due to inappropriate irrigation techniques represents a huge problem to upstream and downstream riparians. This project aims to raise the professional skills of water specialists, farmers, and water user associations through the establishment of professional training centers. These centers would work to develop educational curriculum and instruction on appropriate practice and technology of irrigation to reduce water and energy demand, and to reduce land degradation and erosion. The professional training centers would both equip water professionals and users, and promote further technological innovation on irrigation techniques.

Additionally, training centers would eventually become service providers, for which farmers and other water users could pay, which would contribute to continuing operations. These centers could improve knowledge on the use of water in the basin, and equip water users to continue re-evaluating water use practices, to synchronize efficient water-use across borders, as well as to develop innovative techniques regarding water use for agriculture in the region.



Action Plan

I. Problem Addressed

High degree of land degradation, largely due to inappropriate irrigation techniques

II. Solution

By 2030, significantly raise the professional skills of water specialists, farmers and water user associations, through professional training centers

III. Steps/Timeline:

By 2020:

- 1) Create steering committees with regional representatives
- 2) Identify possible funding sources
- 3) Conduct a scoping study, identify trainers and specialists
- 4) Create training modules/ curriculum, develop pilot program
- 5) Conduct risk analysis

By 2025:

- 1) Become centers of excellence
- 2) Maintenance and Evaluation, including self-sufficiency of centers
- 3) Risk analysis and Iterative process, lessons learned

IV. Estimated Funding Requirement:

- \$1 million USD to open the training centers
- 20% of initial costs invested yearly for maintenance and continuation
- Future farmer fees collected for training services

V. Obstacles:

- Availability of funding
- Bureaucracy/political approval
- Long-term political and financial commitment
- Keeping control

- Lack of Innovation
- Impact of climate change on water supply
- Tensions between urban and rural areas

VI. Partners:

- Other Research and Development Institutes
- Ministries and other State Agencies
- Melioration stations
- Ministry of Energy (of each government)

VII. Benefits:

- Long-term competitiveness through reduced soil erosion and resource use
- Reduced liability to national government
- Improved Environment
- Farmers save on energy costs
- Fosters competition between farmers for best practices
- Reducing cross-border

water disputes by conserving water

VIII. Risks:

- Lack/loss of governmental approval
- Corruption and mismanagement of allocated resources
- Unaffordable for farmers
- Promotion of locally inappropriate technologies

Group Five: Network of Nexus Knowledge & Innovation Centers

In order to move towards regional food security, this project would improve irrigation and agricultural practices through the creation of a network of knowledge and innovation centers. This would improve working knowledge on nexus issues, and would create cooperation on the nexus at regional and national levels. Through capacity building, demonstration and improved reporting procedures, this project would first define each country's water demand, and would verify existing data on water use and water needs. Additionally, this project would work to survey the already available irrigation and agronomic options and technology.

In the second stage the project would work with farmers, Water User Associations, and investors to develop activities in the upper basin on agricultural and horticultural improvements, and improve food storage and food processing in the supply chain. Additionally, the knowledge and innovation centers would work to study, and design improvements to current approaches to pest management and soil conservation. Finally, the program would leverage the interests of the private sector, in order to develop a network of academic institutions, such as research organizations and educational programs promoting advanced agricultural practices.

Action Plan

I. Problem Addressed

In Tajikistan, 56% of the population is malnourished. Food security is needed in upstream countries

II. Solution

By 2030, establish a network of knowledge and innovation centers to improve cooperation on the water-energy-food nexus at regional and national levels

III. Steps/Timeline:

By 2020:

- 1) Capacity building + reporting procedures
- 2) Define each country's demand for water
- 3) Verify existing data for irrigation, energy demand, water needs etc
- 4) Incentivise regional "ownership" of capacity building
- 5) Feasibility study for regional energy market
- 6) Accounting of available irrigation, agronomic options + technology

By 2025:

- 1) Invest in upper watershed integrated agricultural improvements
- 2) Improve food storage + processing entire supply chain
- 3) Implement customary practices to support buy-in to new technologies and approaches
- 4) Improve/new approaches to Pest management, soil management, varieties, agronomy, water

By 2030:

- 1) Leverage private sector support
- 2) Extend to Academia, research organizations and schools

IV. Estimated Funding Requirement:

- By 2020—U.S. \$2 million in total across 5 activities
- By 2025—U.S. \$25 million

V. Obstacles:

- Willingness to provide

data

- Prevent brain drain resulting from capacity building
- Infrastructure
- Regulations
- Legal framework
- Technologies
- Resistance to change
- Political instability
- Lack of incentive, "Nobody cares"

VI. Partners:

- Governmental institutions
- Research and Training Centers
- Practitioners, Professional Communities
- Universities
- Regional organizations
- Rural advisory centers
- Private sector

VII. Benefits:

- Improved use of water and energy
- Improved irrigation techniques
- Increased awareness of cross-sectoral interdependencies
- Improved environmental

conditions

- Increased cooperation and integration at the regional level
- Improved flow of information
- Trust building (bottom-up)
- Improved livelihood of regional population

VIII. Risks:

- Outcome will not reach end user
- Resistance to change
- Lack of incentives
- Lack of sustainability
- Inappropriate technologies chosen
- Governmental approval
- Short term commercial interests prevail

In outlining options for moving towards sustainable cotton production, citing trends and case studies **Liesl Truscott**, farm engagement director of TextileExchange, addressed a host of complex issues surrounding one of Central Asia's most significant crops. Production has decreased somewhat in the region since the era of the "cotton basket" of the Soviet Union, as countries have diversified through increased wheat production. Cotton nonetheless remains a primary export in Central Asia, with Uzbekistan, Turkmenistan and Tajikistan among the world's top 20 producers. In Tajikistan, Turkmenistan, Kyrgyzstan and Uzbekistan, over 40 percent of the labor force is in the agricultural sector.⁴⁷ As the agricultural sectors of Turkmenistan and Uzbekistan mainly consist of cotton, much of the population is employed in the cotton sector.

Truscott pointed to excessive use of agrochemicals and pesticides, as well as high-water consumption and contamination, as key problem in much cotton production, but also asserted that organic cotton is achievable in Central Asia and could be a mechanism for improving well-being and economic development. As a heat-loving and rather drought resistant cash-crop, cotton could be a well-suited crop in Central Asia's arid climate. Additionally, cotton represents a foreign currency earner, and an industry in which individual farmers could add-value to their products by expanding their processing activities (such as cutting, packing, cleaning, boiling, pulping and drying). Transitioning from conventionally to sustainably-produced cotton is another way for farmers to increase the value of their products. Truscott presented a case study from Tajikistan, where TextileExchange, with support from Helvetas, created a cooperative for organic cotton production that brought organic farmers earnings equivalent to nearly seven times the average salary of agricultural workers in Tajikistan.

Meeting Highlights

Meeting Highlights

Said Yakhyoev, program assistant with the Organization for Security and Cooperation in Europe (OSCE), presented a case study of Rasht Valley, a poor rural area in Tajikistan, to argue for a bottom-up approach to solving energy problems. National level projects, as well as international development banks, have promoted the development of small-scale hydropower, as a way to reduce reliance on fossil fuels. While providing electricity in a sustainable manner is an important international goal, Yakhyoev argued that these small-scale hydropower projects tend to suffer from poor efficiency and large expense. They also fail to address a basic need in impoverished areas of Tajikistan: winter heating. In rural Tajikistan, 60-80 percent of electricity is used for heating purposes in the cold winter months. Tajikistan famously suffers huge energy deficits in these months, and often experiences complete blackouts in rural areas for weeks at a time, and even daily blackouts in urban areas. Rivers supplying the hydroelectric plants, the country's main source of electricity, often freeze solid in the extreme temperatures. Since most of the energy is produced in the summer, when hydropower facilities are working, and most of the energy need is in the winter, Tajikistan's seasonal energy supply and demand are unevenly matched.

Yakhyoev proposed the use of readily-available coal to meet household heating needs. This solution, Yakhyoev argued, would satisfy critical needs in the short-term, thereby enabling the economic development that could allow for more sustainable solutions in the long-term. A representative of the energy sector, Nikolai Sviridov, Deputy Director of Mezhhregionsoyuzenergo (Inter-regional Energo-Union"), agreed with Said, and argued that to increase the standard of living in Central Asia, energy security must be addressed, especially for Tajikistan.

Here panel members challenged a reflexive reliance on traditional donors, and they recommended a much stronger involvement of the private sector where relevant.

Disparities in economic development between countries were also highlighted as an obstacle to cooperation between governments, pointing to the advisability of scaling back very ambitious schemes. The proposed creation of a regional energy market (Group 3), could improve economic cooperation, although the reality is that this type of undertaking is not likely feasible at present due to regional sensitivities and vested political interests. A more manageable approach could focus on small-scale energy cooperation, or small-scale grid integration projects, although participants were reminded of the difficulty in achieving this using an example from Rasht Valley in Tajikistan. In Tajikistan—donor efforts to move from dependency on coal to a renewable future was both intermittent in delivering electricity, costly and questionably sustainable. Small-scale projects could be complimented by setting the foundations for a regional agricultural commodities market.

Finally, a lack of political commitment to improving regional resource management was an overriding concern. The origins of the European Union lay in a willingness by former adversaries to lay aside a difficult history in favor of a better future.

Next Steps

Actions Plans and outcomes from the discussion will be further reviewed in terms of their geographic coverage and national prioritization, together with regional relevance and development strategies. Initial discussions with donors will take place to assess their interest, and link the action-plan owners to those interested in future discussions and possible support by the end of 2014.

Discussions from the workshop were also taken into the global nexus dialogue on water infrastructure solutions in Beijing in November 2014, and will be discussed in South Korea at the 7th World Water forum in April 2015.

Meeting Highlights

Many promising regional initiatives exist to improve the use of water resources in Central Asia. Giovanni Munoz, land and water engineer at the Food and Agriculture Organization of the United Nations (FAO) argued that an ongoing initiative, titled “Scenario Thinking to Enhance Water Cooperation in the Aral Sea Basin,” has helped participants to agree that investments in water resources infrastructure alone are not enough to significantly increase agricultural output and water productivity. Additionally, this initiative and the use of scenario thinking has enabled experts to come to similar conclusions on climate change, agricultural trade and population growth, suggesting that joint discovery to reach a “communality of views” is an important outcome in itself. This act of mutual discovery can bring actors together in their understanding of a particular issue, and therefore provides a means by which they

might start to move past zero-sum thinking in order to make better decisions.

The United Nations Economic Commission for Europe (UNECE) has undertaken another important initiative which addresses natural resource management in Central Asia. Annukka Lipponen, environmental affairs officer of the UNECE, argued that UNECE work on the nexus in the Syr Darya basin could be incorporated into the existing National Policy Dialogues (NPD) framework. This approach would use participatory workshops and indicator-based analysis to generate a nexus assessment report, which could be incorporated into the NPD framework, in order to discuss results at the national level among the different stakeholders. These types of regional initiatives offered examples to workshop participants during the project proposal sessions.

Workshop Agenda

DAY 1: Tuesday, July 15, 2014

The Nexus Realities: From Global Paradigm to Action in Amu Darya River Basin

Time	Session	Summary
8:30-9:00	Arrival & Registration	–Welcome desk located on the first floor of the DoubleTree, outside Daphne conference room
9:00-9:30	Opening Session	Welcome & Introduction Welcoming Addresses by IUCN/IWA/EWI Participant Introductions Agenda review (objectives, structure, expectations)
9:30-10:00	The Nexus Dialogue	Outline overall purpose of the Nexus Dialogue on Water Infrastructure and key findings to date (IUCN/IWA)
10:00-10:30	BREAK	
10:30-12:30	The Water Challenge Game	Facilitated Interactive Exercise Illustrates economic/political/social/environmental costs of uncoordinated development paths Basis for discussion on opportunities/challenges and requirements for integrated approach in ADRB
12:30-13:30	LUNCH	
13:30-15:30	Status of the Nexus in Central Asia	Presentations providing up-to-date overview of nexus challenges and national & international efforts to address them, including success stories. Dr. Iskandar Abdullaev , Executive Director, Regional Environmental Center for Central Asia (CAREC) Mr. Rieks Bosch , Consultant, EcoCoast Consultancy Dr. Jusipbek Kazbekov , Researcher – Water Management Specialist, Central Asia Office, International Water Management Institute (IWMI) Dr. Annukka Lipponen , Environmental Affairs Officer, United Nations Economic Commission for Europe (UNECE) Mr. Victor Novikov , Project Manager, Zoï Environmental Network Plenary Discussion: Questions & Answers, Comments & Additions
15:30-16:00	BREAK	
16:00-17:00	Towards ADBR Action Plan 2030: Identifying Specific Nexus Problem/ Opportunity Areas	Group Work: Participants will work in Upper Basin and Lower Basin groups to conduct deeper analysis of policy, economic, social, technical, legal and environmental problems (PESTLE) in relation to water-food-energy interactions.
17:00-17:40	Spotlight on Afghanistan	Presentation and discussion providing overview of nexus challenges in Afghanistan, and national efforts to address them: Dr. John F. Shroder , Senior Research Scholar, Center for Afghanistan Studies, Emeritus Professor of Geography and Geology, University of Nebraska at Omaha (via remote access)

17:40	Day 1 Close
19:15	Depart from hotel at 19:15 for Kebap dinner, generously hosted by EWI Board Member Zuhail Kurt, Chief Executive Officer of Kurt Group.

DAY 2: Wednesday, July 16, 2014
Mapping Nexus Solutions for Amu Darya River Basin

Time	Session	Summary
9:00-9:15	Introduction to Day 2	Brief recap of Day 1 and overview of Day 2 activities
09:15-10:30	A Focus on Nexus Solutions	Presentations on innovative and potentially scalable solutions to interconnected WEF challenges, followed by plenary discussion. Mr. Gary Lawrence , Chief Sustainability Officer, AECOM Technology Corporation Dr. Giovanni Munoz , Land and Water Development Engineer, Investment Centre Division, Food and Agriculture Organization of the United Nations (FAO) Mr. Nikolai Sviridov , Deputy Director, Mezhhregionsoyuzenergo Ms. Liesl Truscott , European & Farm Engagement Director, TextileExchange
10:30-11:00	BREAK	
11:00-12:30	Plenary Discussion: Questions & Answers, Comments & Additions	
12:30-13:30	LUNCH	
13:30-14:30	Towards ADBR Action Plan 2030: Identifying Nexus solutions	Group Work: Based on menu of solutions presented, Participants identify solutions that could enable ADRB countries to reach the Nexus 2030 Vision
14:30-15:15	Towards ADBR Action Plan 2030: Prioritizing Nexus solutions	Group Work: All participants assess the solutions developed and vote on the ones considered viable and catalytic
15:15-15:30	BREAK	
15:30-17:30	Towards ADBR Action Plan 2030: Developing an Action Plan for Implementation of Priority Nexus Solutions	Group work: The groups will develop a more detailed action plan to implement the different solutions to 2030, identifying objectives, requirements & enabling conditions, and key stakeholders

17:30	Day 2 Close
18:15	A sunset reception and Iftar dinner, generously hosted by Kiler Holding Company, will be held at the top of the Sapphire building.

DAY 3: Thursday, July 17, 2014
Mobilizing Nexus Solutions for the Amu Darya River Basin

Time	Session	Summary
09:00-09:15	Introduction to Day 3	Brief recap of Day 2 and overview of Day 3 activities
09:15-09:30	Designing Investment Grade Project Proposals	Presentation by Mr. Deltcho Vitchev , Director of Renaissance Finance International on main considerations and elements related to financing of water and green energy projects.
9:30-9:45	Presentation on Energy Finance in Tajikistan	Presentation by Mr. Said Yakhoev , Programme Assistant with OSCE Office in Tajikistan.
09:40-13:00	Towards ADBR Action Plan 2030: Refining Nexus Proposals	Group Work: Transform solutions into investment grade project proposals, including key milestones, partnerships and timelines.
13:00-14:00	LUNCH	
14:00-16:30	A Vision for a Sustainable Future -Solutions for Central Asia in a Global Context	Presentations and Q&A of project proposals to panel of high-level experts Mr. Mehmet Tiryakioglu , Board Member, Tiryaki Agro Mr. Mustafa Baltaci , Secretary General, Federation of Euro-Asian Stock Exchanges (FEAS) Dr. Jenniver Sehring , Environmental Affairs Adviser, OSCE Mr. Gary Lawrence , Chief Sustainability Officer, AECOM Dr. Iskandar Abdullaev , Executive Director, Regional Environmental Center for Central Asia (CAREC)
16:30- 17:00	Closing Remarks from EWI and IUCN/IWA – Workshop Close	

List of Participants

Last Name	First Name	Affiliation
Abdullaev	Iskandar	Regional Environment Center for Central Asia (CAREC)
Aminova	Munira	Verje University of Brussels and Executive Director of Central Asian Research and Development Network (CADN)
Beltaci	Mustafa	Federation of Euro-Asian Stock Exchange (FEAS)
Bosch	Rieks	EcoCoast Consultancy
Çalkıvık	Konca	Business Council for Sustainable Development (BCSD) Turkey
Collinsworth	Allen	EWI Fellow
Cowan	Joel	Earnest Scheller, Jr. College of Business at Georgia Tech, USA/EWI Board Member
Creighton	James	EastWest Institute
Cross	Katharine	IWA
Dalton	James	IUCN
Djanibekov	Nodir	Leibniz Institute of Agricultural Development in Transition Economies (IAMO), Germany
Eagan	Isaac	Spirit of America, Washington, D.C., USA
Ferenz	Michele	EWI
Gritsenko	Natalya Vladimirovna	Kazakh Scientific Research Institute of Water Economy
Ibatullin	Saghit	UN Economic Commission for Europe (UNECE) Water Convention
Jones	Barbara	U.S. Department of State

Kamalov	Yusup	Global Water Partnership Central Asia; Head of Union for the Defense of the Aral Sea & Amudarya
Kazbekov	Jusipbek	Central Asia, International Water Management Institute (IWMI)
Kholmatov	Anatoliy	UNDP, Tajikistan
Kholmatov	Daler	Ministry of Energy and Water Resources, Tajikistan
Kryc	Kelly	U.S. Department of State
Kurt	Zuhal	Kurt Holding Group/EWI Board Member
Latorre	Carolina	IWA
Lawrence	Gary	AECOM
Lipponen	Annuka	United Nations Economic Commission for Europe (UNECE)
Matthews	Nate	CGIAR Research Program on Water, Land and Ecosystems (WLE)
Mirdadayev	Mirobit Salimovich	Kazakh Scientific Research Institute of Water Economy
Mosello	Beatrice	Overseas Development Institute, UK
Munoz	Giovanni	Food and Agriculture Organization of the UN
Novikov	Victor	Zoi Environment Network
Nurmuamedova	Guljamal	Economic Society Ynanch-Vepa (NGO, Turkmenistan)
Oskarsson	Katerina	Institute for the Analysis of Global Security (IAGS), Department of Political Science/International Studies - Old Dominion University
Paradise	David	Embassy of US, Kazakhstan, US State Department
Park	Allen	International Food Policy Research Institute (IFPRI)

Pulatov	Yarash	Tajik Research Institute of Hydraulic Engineering and Land Reclamation
Rahimova	Shahlo	HELVETAS Swiss Intercooperation -- Tajikistan office
Sanchez	Juan	IUCN, Environmental Law Center
Sehring	Jenniver	Organization for Security and Cooperation in Europe (OSCE) Vienna, Austria
Schaitkin	Hope	EWI
Shobair	Sayed Sharif	Water Resources Expert, Afghanistan
Shokhrukh-Mirzo	Jalilov	Aalto University, Esbo Finland
Shroder	Jack	University of Nebraska at Omaha
Sokolov	Vadim	Global Water Partnership (GWP)
Sviridov	Nikolai	Mezhregionsoyuzenergo (Inter-regional Energo-Union")
Tiryakioglu	Mehmet	Tiryaki Agro
Truscott	Liesl	Textile Exchange, HQ in U.S. with operations in eight countries
Turok	Joseph	International Centre for Agricultural Research in Dry Areas (ICARDA)
Vitchev	Deltcho	Renaissance Finance International Ltd.
Yakhyoev	Said	Organization for Security and Cooperation in Europe (OSCE), Tajikistan
Yu	Hongyuan	Institute for International Studies/Center for International Energy Strategy Studies, Renmin University of China, Shanghai
Ziganshina	Dinara	Scientific Information Center - Interstate Coordination Water Commission (SIC ICWC)

ENDNOTES

- 1 Fritzsche, Kerstin, et al. "Climate Change and the Water-Energy-Agriculture Nexus in Central Asia." Adelphi Background Paper (2011). http://programme.worldwaterweek.org/sites/default/files/carec_nexus_approach.pdf
- 2 UN Development Programme (UNDP), Human development report 2014 - Sustaining Human Progress: Reducing Vulnerabilities and Building Resilience. (2014). <http://hdr.undp.org/sites/default/files/hdr14-report-en-1.pdf>
- 3 Transparency International, Corruption Perception Index. <http://www.transparency.org/research/cpi/overview>
- 4 Linn, Johannes F. "Tajikistan: Progress and Problems at the Heart of Central Asia." The Brookings Institution. N.p., 9 July 2008. Web. 30 Sept. 2014. <http://www.brookings.edu/research/opinions/2008/07/09-central-asia-linn>
- 5 World Development Indicators, The World Bank, accessed September, 2014. <http://data.worldbank.org/indicator/SI.POV.RUHC/countries/1W?display=default>
- 6 Central Intelligence Agency. The World Factbook. Tajikistan, accessed September 2014. <https://www.cia.gov/library/publications/the-world-factbook/geos/ti.html>
- 7 United Nations Development Programme (UNDP), Human Development Reports, Kyrgyzstan. Accessed September 2014. <http://hdr.undp.org/en/countries/profiles/KGZ>
- 8 Central Intelligence Agency. The World Factbook. Kyrgyzstan, accessed September 2014.
- 9 World Bank Uzbekistan profile, The World Bank, accessed September, 2014. <http://data.worldbank.org/country/uzbekistan>
- 10 World Bank Turkmenistan profile, The World Bank, accessed September 2014. <http://www.worldbank.org/content/dam/Worldbank/document/Turkmenistan-Snapshot.pdf>
- 11 Central Intelligence Agency. The World Factbook. Turkmenistan, accessed September 2014. <https://www.cia.gov/library/publications/the-world-factbook/geos/tx.html>
- 12 Olivier Normand, "Regional Rural Water Supply and Sanitation Project Ferghana Valley", Towards the 6th World Water Forum – Cooperative Actions for Water Security, International Conference, Tashkent, 12-13 May 2011, http://www.cawater-info.net/6wwf/conference_tashkent2011/files/normand_e.pdf
Almaz Isman and Mirlan Toktaliev, "Кыргызстан без воды" ["Kyrgyzstan without water"], Radio Free Europe/RadioAzattyk, 13 December 2012.
- 13 Fritzsche, Kerstin, et al (2011).
- 14 IPCC, 2014: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part B: Regional Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Barros, V.R., C.B. Field, D.J. Dokken, M.D. Mastrandrea, K.J. Mach, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, XXX pp.

- 15 The World Bank, Fay et al. Adapting to Climate Change in Europe and Central Asia, 2010. http://siteresources.worldbank.org/ECAEXT/Resources/258598-1243892418318/ECA_CCA_ch6.pdf
- 16 IPCC (2014).
- 17 The World Bank (2010).
- 18 M. Akmurudov et al, "Environment and Security in the Amu Darya Basin"; UN Environmental Programme (UNEP), (2011). <http://envsec.org/publications/AmuDarya-EN-Web.pdf>
- 19 IPCC (2014).
- 20 Liston, Enjoli. "Satellite Images Show Aral Sea Basin 'completely Dried'" The Guardian 1 Oct. 2014.
- 21 Stucki, Virpi, and Suvi Sojamo. "Nouns and Numbers of the Water-Energy-Security Nexus in Central Asia." International Journal of Water Resources Development 28.3 (2012): 399-418.
- 22 Akmurudov et al (2011).
- 23 Weil, Stephen. "Tit-for-Tat: The Evolution of Non-Cooperation over the Rogun Dam." Center for Strategic and International Studies. N.p., 1 Feb. 2012. <http://csis.org/blog/tit-tat-evolution-non-cooperation-over-rogun-dam>
- 24 Weil (2012).
- 25 The World Bank (2010).
- 26 The World Bank. Key Issues for Consideration on the Proposed Rogun Hydropower Project. September 2014. http://www.worldbank.org/content/dam/Worldbank/document/eca/central-asia/World%20Bank%20Note%20-%20Key%20Issues%20for%20Consideration%20on%20Proposed%20Rogun%20Hydropower%20Project_eng.pdf
- 27 The World Bank (2014).
- 28 The World Bank (2014)
- 29 Scheme on Complex use and protection of water resources of in the Amu Darya, Sredazgiprovodhlopok Design Institute, Tashkent, 1971.
- 30 United Nations Office for the Coordination of Humanitarian Affairs (UN OCHA). Afghanistan Common Humanitarian Action Plan 2013. December 2012.
- 31 Presentation by Prof. Dr. Abdul Rahman, Carnegie Endowment for International Peace. Energy Sector Afghanistan. http://carnegieendowment.org/files/Presentation_-_%20Ashraf.pdf
- 32 United Nations Office for the Coordination of Humanitarian Affairs (2013).
- 33 United Nations Office for the Coordination of Humanitarian Affairs (2013).

- 34 Ahmad, Masood and Wasiq, Mahwash ,Water Resource Development in Northern Afghanistan and Its Implications for Amu Darya Basin, World Bank Working Paper No.36, World Bank, 2004. <http://elibrary.worldbank.org/doi/pdf/10.1596/0-8213-5890-1>
- 35 Ibid, Ahmad, Masood and Wasiq, Mahwash (2004).
- 36 http://www.usea.org/sites/default/files/event-file/522/Afghan_Power_Sector_Briefing_June_2011.pdf
- 37 Denisov, Nickolai and Libert, Bo. Zoi Environmental Network and United Nations Economic Commission for Europe (UNECE). Water Information for Central Asia – A framework for future development. March 2012. http://www.unece.org/fileadmin/DAM/env/water/cadialogue/docs/Inform_meeting/The_future_of_water_information_in_Central_Asia_final_18March2012.pdf
- 38 Denisov, Nickolai and Libert, Bo (2012).
- 39 Akmurdov et al (2011).
- 40 Akmurdov et al (2011).
- 41 Fumagalli, Matteo. "Food security in Central Asia: A priority for Western engagement." Journal title Central Asia-Caucasus analyst (2008): 12-14.
- 42 Granit, Jakob, et al. "Regional water intelligence report Central Asia."Stockholm, March (2010).
- 43 Fumagalli (2008).
- 44 Scheme on Complex use and protection of water resources of in the Amu Darya, Sredazgiprovodhlopok Design Institute, Tashkent, 1971.
- 45 Ahmad, Masood and Wasiq, Mahwash (2004).
- 46 Afghanistan National Development Strategy: A Strategy for Security, Governance, Economic Growth and Poverty Reduction." 2008-2013. http://www.undp.org.af/publications/KeyDocuments/ANDS_Full_Eng.pdf.
- 47 Laruelle, Marlène, and Sébastien Peyrouse. Globalizing Central Asia: Geopolitics and the Challenges of Economic Development. Armonk, NY: M.E. Sharpe, 2013.

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