The Inefficiency of Self-Sufficiency:

Uzbekistan's Response to CASA-1000

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Abstract

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Using the CASA-1000 project as a point of analysis, this paper discusses the politics and management of water between Tajikistan, Kyrgyzstan and Uzbekistan. I want to ascertain the implications of their conflicting goals of optimizing agricultural output (Uzbekistan) and producing hydroelectricity (Tajikistan and Kyrgyzstan). More specifically, why do the governments of these countries continue to insist upon asserting self-sufficiency and hardline territorial sovereignty over transboundary waters when cooperation and joint management would not only be more sustainable but also less costly. How has the loss of transboundary water-energy exchange agreements that existed during the Soviet Union impacted sustainable development in the region today?

Current discourse on water security centers around water war theory, which states that scarcity of vital water resources will incite violence and possible war between neighbors who share that resource. While some scholars support this theory, many more are skeptical of it, arguing instead that scarcity breeds cooperation. Should Central Asian countries continue to value water based on volume rather than benefits derived, they will continue to face rapid deterioration of transboundary waters that may lead to more serious conflict in the future.

Downstream Uzbekistan views the project as a threat to downstream interests and

access to their main source of water for irrigation - the Amu and Syr Daryas. Tashkent was given the opportunity to be involved in the project but declined due to disagreements over the source of electricity - several new hydropower dams that could seriously diminish the flow of water down stream during key agricultural growing months. The involvement of international organizations in the project will also be explored to determine whether aid helps or hinders cooperation and joint management in Central Asia.

ABBREVIATIONS

CAS – Central Asian States

ICWC – Inter-State Commission on Water Coordination

CASAREM – Central Asia-South Asia Regional Electricity Market

CASA-1000 – Central Asia-South Asia Electricity Transmission and Trade (1000MW)

UZ – Uzbekistan

TJ – Tajikistan

TM – Turkmenistan

KZ – Kazakhstan

KG- Kyrgyzstan

RU – Russia

BY – Belarus

ICJ – International Court of Justice

I. INTRODUCTION

Water is vital not only to human life but also to sustainable economic development. Access to a shared water resource and the competing uses of it can lead to serious conflict between riparian parties if left unchecked. The newly independent Central Asian states (CAS) are no strangers to water conflict. While upstream Kyrgyzstan and Tajikistan consider themselves to be water rich, their downstream neighbor—Uzbekistan—is admittedly less so. As the water's source originates with its upstream neighbors, the Uzbek government has become increasingly concerned about new development plans that will divert and/or withhold water from key agricultural needs downstream.[1] The reality of impending water scarcity in the region has further compacted tensions, causing relations between the states on water-related issues to devolve.

Lack of cooperation, coupled with inefficient water use can and will lead to the exacerbation of old and future problems for the region: depletion of municipal water supplies and reserves (beyond seasonal shortages), intensified geopolitical and armed conflict, economic hardship (within the energy and agricultural sectors and progressively throughout) and environmental degradation. These current and impending issues indicate that the status quo of water resource management and policy in Central Asia is not only inefficient but also unsustainable. Without a major shift in diplomatic strategy or a change to the political valuation of water resources Tashkent is unlikely to find a solution much less reach a compromise on the CASA-1000 project with Dushanbe and Bishkek.

Through observation of the proposed CASA-1000 Hydropower exchange project and survey of how prior water agreements, existing laws and precedents inform the

[1] Озодлик Радиоси, 2015, "Тошкент минтақада сув омборлари қурилишига яна қаршилигини билдирди," *Ozodlik.org,* October 12.

actions of the involved parties (Kyrgyzstan, Tajikistan and Uzbekistan), I explore the basis of water conflict and how it informs hydropolitics and all of its complexities in the region. Based on my analysis I then provide several policy solutions I believe to be realistic alternatives to Uzbekistan's current opposition strategy. My thesis is led by three guiding research question:

1. Does the situation between Uzbekistan, Tajikistan and Kyrgyzstan lend itself more to the Water Wars or Cornucopian theory?
2. If the former, what legal avenues are available to Uzbekistan to oppose the project without resorting to violent conflict? Which of these actions is Tashkent willing and/or unwilling to take?
3. What international laws and or precedents exist between riparian parties in the region and how enforceable are they really? What improvements can be made to push Central Asia towards a more Cornucopian outcome?

Current discourse on water security centers around the water war theory, which states that scarcity of vital water resources that are shared by two or more countries will incite violence between them.[2] A few scholars have supported this theory, but many more are skeptical of the evidence in support of it. Scholars like David Katz and Aaron Wolf argue instead for the cornucopian model, suggesting that history shows water scarcity breeds cooperation and technological advancement rather than conflict.[3] The possible cost of losing the resource completely is far higher than that of war, making cooperation a

[2] J.A. Allan, 1998, "Virtual water: A strategic resource," *Ground Water,* 36 (4), 546.
[3] David Katz, 2011, "Hydro-Political Hyperbole: Examining Incentives for Overemphasizing the Risks of Water Wars," *Global Environmental Politics,* 11 (1), 16.

more attractive alternative for all parties involved.[4] For this reason, despite the cornucopian modeling appearing to be the more common outcome, my research is meant to continue discussion on the possibility if not of wars than of water conflicts in a world fast altered by climate change. The positivity of water optimists makes it easy to believe these issues will resolve themselves, but the cautious skepticism of water pessimists is equally influential in pushing the cooperation and technological advancement necessary to meet the challenge of water scarcity.[5]

Tashkent and its upstream neighbors continue to insist upon asserting self-sufficiency and eschewing tangible cooperative efforts to organize and enforce resource management regulations together despite the fact that joint projects would not only be less costly but also more efficient. The loss of the transboundary water-energy exchange agreement that existed during the Soviet Union has left a hole in the sustainable development efforts of the region that more than 20 treaties following have been unable to fill. Why, despite seemingly so much effort, are they unable to surpass this water management stalemate? While one could argue that this is an obvious case of realpolitik, the conundrum lies in the fact that this previous exchange agreement not only existed but arguably helped Central Asia to flourish.[6] Furthermore, Tajikistan, Kyrgyzstan and Uzbekistan are all party to newer framework agreements that provide similar opportunities for cooperation.[7]

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[4] Aaron T. Wolf, 2007, "Shared Waters: Conflict and Cooperation," *Annual Review of Environment & Resources,* 32 (1), 245.
[5] Tony Allan, (2011), "Water Security and the Role of Trade," University of Waterloo, https://www.youtube.com/watch?v=pE9towQxE5M.
[6] International Crisis Group, (2011), "Central Asia: Decay and Decline," February 3, 2011, 10-11.
[7] Dinara Ziganshina, 2011, "The Role and Relevance of the UN Watercourses Convention to the Countries of Central Asia and Afghanistan in the Aral Sea Basin," *unwatercoursesconvention.org*, 14.

The following section provides background information from water-energy exchange agreements held during the Soviet Union to the current regional agreements on water management. It also discusses other existing issues—border disputes, ethnic tensions and economic posturing—that have an impact on water conflict in the region. The third section is a literature review of current scholarship on transboundary water security and hydropolitics including an analysis of Central Asia's place within this scholarship. The fourth section outlines bilateral, regional, and international treaties CAS are involved in as well as national and international laws and precedents on water. Based on the information gathered in section four, section five provides policy recommendations for the Uzbek government in opposition to this and similar projects that might arise in the future. The paper concludes by arguing that the proposed solutions of section five would not only help to lessen political tensions but also foster the cooperation and technological advancement necessary to overcome water scarcity and energy shortage concerns.

II. BACKGROUND

The Aral Sea

For most, water security in Central Asia immediately calls to mind the Aral Sea disaster. Once the fourth largest lake in the world, in less than fifty years the Aral Sea all but disappeared due to over-zealous irrigation schemes enacted during the Soviet Union and continued after independence. For the new states of Central Asia the Aral Sea was a unifying concern and the primary subject of early water-related treaties that brought them together following independence. Many of the treaties signed after 1991 involved ambitious plans to save the Aral Sea. Chief amongst them was the Kyzl-Orda Agreement

of 1993.[8] The presidents of all 5 nations signed this treaty, executed on the 26th of March 1993, in which they acknowledged the threats to health, economic development, and the environment continued neglect of the issue would pose.[9]

They also committed to more rational use of water resources in the Aral Sea Basin, maintaining water quality, inflow management to stabilize the Aral Sea levels, rejuvenation of biodiversity in the sea's two tributaries (Syr and Amu Darya), and coordinating development strategies to prevent future issues.[10] In 1999 the signatories reconvened to hammer out details on duties and enforcement mechanisms (Agreement on the Status of the International Fund for Saving the Aral Sea). All five CAS were also involved in other international treaties, including the Conventions on Climate Change (1992) and Desertification (1994) facilitated by the UN.[11] Treaties calling attention to the Aral Sea disaster tended to enjoy more international attention and significantly more funding opportunities. As a result, treaties of this nature were more quickly and easily agreed upon than those broaching issues that many Central Asian officials seemed unwilling to budge on.

Treaties

Much attention was paid to the Aral Sea issue, but immediately following independence from the Soviet Union the new CAS also tried to reach an agreement on

[8] Ibid,15. *Kyzl-Orda Agreement is officially known as *Agreement between the Republic of Kazakhstan, the Kyrgyz Republic, the Republic of Tajikistan, Turkmenistan, and the Republic of Uzbekistan on Joint Actions for Addressing the Problems of the Aral Sea and Its Coastal Area, Improving the Environment, and Ensuring the Social and Economic Development of the Aral Sea Region*.
[9] *Agreement between the Republic of Kazakhstan, the Kyrgyz Republic, the Republic of Tajikistan, Turkmenistan, and the Republic of Uzbekistan on Joint Actions for Addressing the Problems of the Aral Sea and Its Coastal Area, Improving the Environment, and Ensuring the Social and Economic Development of the Aral Sea Region*, Kyzl-Orda. art. 5.
[10] Ibid, art. 1.
[11] Ziganshina, 17-19.

joint water management. With the Almaty Agreement in 1992, they had initially sought to prevent future discrepancy or conflict by agreeing to continue to honor the water-energy exchange agreement of Soviet times.[12] The treaty later led to the formation of the Inter-State Commission on Water Coordination (ICWC), an institution meant to enforce regulations to be agreed upon by all five states.[13] Unfortunately, neither the treaty nor its newly formed commission managed to maintain their initial momentum. The Almaty Agreement was made obsolete by the numerous treaties that succeeded it and CAS were unable to reach consensus on the ICWC's duties or the regulations it was made to enforce.

The old agreement that had suited the region during the Soviet Union was suddenly insufficient in matching the changing economies and ambitious assertions of national sovereignty that pulled CAS in different directions. Tashkent no longer saw water from Tajikistan and Kyrgyzstan as a fair exchange for subsidizing their coal and gas when it could be sold for far more on the world market.[14] Less bountiful in natural resources than other CAS, both Bishkek and Dushanbe saw the potential of water both as a tradable economic commodity to barter with Tashkent and as a source of self-sufficient energy.[15]

Resentments festered and cooperation has become increasingly less palatable to the riparian parties. However, their options for alternatives were initially limited. The Almaty Agreement, continuing the Soviet water-energy exchange, was just as much

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[12] Ibid.
[13] Ibid.
[14] International Crisis Group, "Water Pressures," 6.
[15] Shokhrukh-Mirzo Jalilov, Saud A. Amer, and Frank A. Ward, 2013, "Water, Food, and Energy Security: An Elusive Search for Balance in Central Asia," *Water Resources Management: An International Journal - Published for the European Water Resources Association (EWRA),* 27 (11): 3960.

about the exchange of energy resources as it was about water. The entire region shared a unified energy transmission system—the United Energy System of Central Asia—to mitigate seasonal shortages.[16] For this reason, they were dependent upon one another and could not immediately or completely detach their energy sectors.[17]

During the Soviet era Tajikistan and Kyrgyzstan controlled the flow of the Amu and Syr Daryas for the purpose of enhancing irrigation efforts downstream.[18] But the dams were also used to produce hydroelectricity during the summer months.[19] Excess energy was fed into the regional grid and shared. In the winter hydropower production was halted to refill the reservoirs for summer agricultural needs and to prevent flooding downstream.[20] For this Tajikistan and Kyrgyzstan depended on Uzbekistan and its other downstream neighbors to offset energy shortages with coal, oil, excess thermal energy and natural gas exports.[21] However, the reliability of this system could no longer be counted upon. As a result, Tajikistan decided to move forward with plans to finish the Rogun dam.[22] After independence the dam was left incomplete.[23]

[16] International Crisis Group, "Central Asia," 10.
[17] Ibid.
[18] Bakhtiyor Mukhammadiev, (2014), "Challenges of Transboundary Water Resources Management in Central Asia," in *The Aral Sea: The Devastation and Partial Rehabilitation of a Great Lake,* New York, NY: Springer Heidelberg, 235.
[19] Ibid.
[20] Ibid, 236.
[21] International Crisis Group, "Water Pressures," 3.
[22] Umida Hashimova, 2014, "Rogun Dam Studies Set the Scene for Furth Disputes Among Central Asian Countries," *Eurasia Daily Monitor,* August 2014..
[23] The Economist: Intelligence Unit, "Tajikistan."

	Treaty Name	Terms of Treaty	Signatories (Date Signed)	Comments
Sub-regional Agreements	Almaty Agreement	to continue use of Schemes of Complex Water Resource Use and Protection (Soviet regulations originally overseen by Ministry of Reclamation and Water Management)	TJ, UZ, TM, KZ, KG (1992)	formed Inter-State Commission for Water Coordination (ICWC)
	Kzyl-Orda Agreement	to save the Aral Sea	TJ, UZ, TM, KZ, KG (1993)	
	Agreement on the Status of the International Fund for Saving the Aral Sea	to expound upon Kzyl-Orda and Almaty agreements (duties and functions of organizations)	TJ, UZ, TM, KZ, KG (1999)	
	Chardjev Agreement	to regulate water management issues (Amu Darya)	UZ & TM (1996)	
	Agreement on the Use of Fuel and Water Resources, Construction and Operation of Gas Pipelines in Central Asian Region	to foster economic cooperation on fuel and water resources, pipeline construction and operation (Syr Darya)	KZ, KG, & UZ (1996)	
	(Continuation of above Agreement)	Agreement on use of water and energy resources (Syr Darya) to create a cooperative framework	KZ, KG, & UZ (1998), TJ (1999)	
	Agreement on Parallel Operation of the Energy Systems of Central Asian States	to foster more effective operation of energy systems to create a regional 'integral market for electricity'	TJ, UZ, TM, KZ, KG (1999)	
	Agreement on Cooperation in the Area of Environment and Rational Nature Use	regulation of environmental issues, outlining areas of cooperation in use and protection of natural resources	KZ, KG, & UZ (1998)	
	Agreement on Cooperation in the Sphere of Hydrometeorology	cooperation in hydrometeorology	TJ, UZ, KZ, KG (1999)	
	Framework Convention on Environmental Protection for Sustainable Development in Central Asia	seeking to ensure effective environmental protection for sustainable development in Central Asia (pending)	KG, TJ, & TK (2006)	
Regional and International Agreements	Commonwealth of Independent States (CIS) Charter	cooperation on a number of fronts, including environmental issues	TJ, UZ, TM, KZ, KG (1993)	
	Agreement on Interaction in the Field of Ecology and Environmental Protection	to expand on cooperation efforts outlined by CIS charter (pertaining specifically to environmental issues)	KZ, TJ, and KG (1998)	ratified by these three and other CIS
	Agreement on the Main Principles of Interaction in the Field of Rational Use and Protection of the Transboundary Water Bodies	to reach agreement on rational use and protection of transboundary watercourses of CIS	BY, RU, KZ, TJ (1998)	based on provisions from the UNECE Water Convention
	Aarhus Convention	regarding access to information, public participation in decision-making and access to justice in environmental matters	TM (1999) KZ, KG & TJ (2001)	among others (international convention)
	Espoo Convention	to require parties notify and consult each other on major projects with significant environmental impact across borders	KZ & KG (2001) TJ (2004)	among others (international convention)
	Convention on transboundary effects of industrial accidents	to regulate industrial pollution and provide emergency clean up and management mechanisms	KZ (2001)	
	UNECE Water Convention	to help prevent, control and reduce transboundary impact	KZ (2001) UZ (2007)	
	Convention on Biological Diversity	to promote conservation of biological diversity, sustainable use of its components, and fair and equitable sharing of benefits arising from utilization of genetic resources	TJ, UZ, TM, KZ, KG (1992)	
	UN Convention on Desertification	to combat desertification and mitigate effects of drought through effective actions at all levels (particularly in Africa)	TJ, UZ, TM, KZ, KG (1994)	
	UN Framework Convention on Climate Change	framework for intergovernmental efforts to tackle climate change	TJ, UZ, TM, KZ, KG (1992)	
	Ramsar Convention	cooperative framework for conservation of wetland habitats	TJ, UZ, TM, KZ, KG (1971)	

Info from: Dinara Ziganshina, (2011), "The Role and Relevance of the UN Watercourses Convention to the Countries of Central Asia and Afghanistan in the Aral Sea Basin," *unwatercoursesconvention.org*. And from: United Nation, 2003, *Transboundary water cooperation: trends in the newly independent states,* New York: United Nations.

When it became apparent that the Almaty Agreement had failed to continue the prior exchange and management agreements of the Soviet Union the CAS attempted to reach bilateral and sub-regional agreements instead. Uzbekistan and Turkmenistan signed the Chardjev Agreement on water management regulations in 1996.[24] Uzbekistan also signed an agreement on fuel and water resources and pipelines that same year with Kazakhstan and Kyrgyzstan.[25] This agreement was revisited to discuss the formation of a cooperative framework on the development of water and energy resources in 1998 and in 1999 Tajikistan was invited to sign.[26] Also in 1999, all five CAS met for the Agreement on Parallel Operation of the Energy Systems of Central Asian States to discuss integration of their electricity markets.[27] By 2007 the region had hatched or been involved in no less than twenty bilateral, regional and international treaties on various issues pertaining to water and the environment.[28] Despite these treaties on water resources and energy production, creating economic ties outside of the region turned out to be far more appealing. Tajikistan and Kyrgyzstan turned to South Asia to develop the Central Asia-South Asia Regional Electricity Market (CASAREM).

CASA-1000

CASA-1000 is an ambitious project intent on transmitting 1300MW of electricity generated by hydropower in Kyrgyzstan and Tajikistan through a new series of

[24] Ziganshina, 15.
[25] Ibid.
[26] Ibid, 16.
[27] Ibid.
[28] See chart.

transmission lines to Pakistan and Afghanistan.[29] Kyrgyzstan and Tajikistan view the project as an opportunity to develop their untapped hydropower potentials, overcome winter energy shortages, foster self-sufficient energy sources and build lasting economic ties with their South Asian neighbors.

The project was envisioned as part of CASAREM, which brought together Central Asia (Kyrgyzstan and Tajikistan only for now) and South Asia (Afghanistan and Pakistan) with the goals of economic diversification, fostering a lasting economic relationship between the two regions and also creating a more reliable source and delivery system for energy resources. Uzbekistan could potentially become part of CASAREM but so far has refused to cooperate with the existing members in a show of staunch opposition not only to the project itself but also to the proposed hydropower plants that will come with it.[30]

Construction of the transmission lines—expected to span approximately 1300 kilometers across all four countries—is estimated to cost around $953 million, a huge portion of which will be covered by the World Bank.[31] USAID has pledged $15 million dollars to the project.[32] The Islamic Development bank and several other international organizations and financial institutions have endorsed the project, despite growing international skepticism of Kyrgyzstan and Tajikistan's capacity to generate enough energy to overcome their own shortages or to properly maintain the infrastructure once

[29] Casey Michel. (2014, December 5). An Historic, But Pointless, CASA-1000 Accord. *The Diplomat*, December 5, 2014.
[30] Гулнора Равшан, 2011, "Тошкент Душанбенинг нонини яримта қилаяптими?" *Ozodlik.org, May 17.*
[31] International Crisis Group, "Water Pressures," 19.
[32] USAID. (2015, November 20). The US Government continues its support to the energy sector of Tajikistan [Press release].

the project is completed.[33] It is worth noting that the Asian Development Bank withdrew its support for the project in 2013 citing security concerns in Afghanistan.[34]

The project timeline is also a cause for concern. The initial feasibility reports suggest an estimated 58 months from start to finish but varying reports continue shifting the timeline.[35] But Tajik President Rohmon in public statements has claimed that Tajikistan will be trading energy with South Asia no later than 2018.[36] Uzbekistan opposes the project because of the probable impact on downstream access to water for cotton agriculture. Of course, any downstream party would view the diversion of a major water resource as a serious threat to territorial integrity. But beyond disputes over water access there are also serious concerns associated with completion of the Rogun dam, one of several hydropower dams proposed to generate electricity to South Asia via the new transmission lines. The Human Rights Watch reported in June of 2014 that thousands of locals living within the Vakhsh river basin would be displaced by construction and expansion of the Rogun dam.[37]

Damming in general in the region is also associated with several instances of flooding due to poorly calculated storage capacity and reservoir releases.[38] Concerns have also been raised about the dangers of heightening the Rogun dam in an area prone to

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[33] Casey Michel, (2016, January 12). CASA-1000: Finalized or Fantasy? *The Diplomat*, January 12, 2016.
[34] Ibid
[35] SNC-Lavalin International Inc. (February 2011), "Central Asia-South Asia Electricity Transmission and Trade (CASA-1000) Project Feasibility Study Update: Final Report," Transmission & Distribution Division, 15.
[36] Casey Michel, CASA-1000: Finalized or Fantasy?
[37] Human Rights Watch, (2014), "Tajikistan Dam Resettlement Undermines Livelihoods," June 25, http://www.hrw.org/news/2014/06/25/tajikistan-dam-resettlement-undermines-livelihoods.
[38] Iskandar Abdullaev and Shavkat Rakhmatullaev, (2015), "Transformation of water management in Central Asia: from State-centric, hydraulic mission to socio-political control", *Environmental Earth Sciences,* 73 (2): 850.

significant seismic activity.[39] Increased withholding of the Amu Darya's natural flow to the Aral Sea will also contribute to more rapid desiccation.[40] Other common problems of dam construction include: siltation, sedimentation, soil erosion, blockage of fish migration, population displacement, and alteration of the chemical makeup, flow, and temperature of the water—which can seriously impact biodiversity.[41]

History of Conflict and Rhetoric

Uzbekistan's conflict over water with Tajikistan and Kyrgyzstan often is intertwined with other preexisting conflicts between them. According to Tashkent, Dushanbe and Bishkek are strategically withholding water as a bargaining mechanism to force Uzbekistan to subsidize coal and natural gas exports in exchange for guaranteed flow during peak growing months.[42] Tashkent has retaliated by preventing supply shipments from crossing the Uzbek-Tajik border and reaching construction sites.[43] This year Tashkent also finished the new Angren-Pap railway, connecting Tashkent to the eastern Ferghana Valley and completely bypassing Tajik territory. The new railway will eliminate an estimated $28 million in annual revenue for Dushanbe.[44] These reports fuel speculation that this trend of severing economic ties is not just about asserting self-

[39] Human Rights Watch.
[40] Philip Micklin, (2007), "The Aral Sea Disaster," *Annual Review on Earth and Planetary Sciences* 35: 55.
[41] Ibid, 54-55.
[42] Shokhrukh-Mirzo Jalilov, Saud A. Amer, and Frank A. Ward. (2013), "Water, Food, and Energy Security: An Elusive Search for Balance in Central Asia", *Water Resources Management: An International Journal - Published for the European Water Resources Association (EWRA),* 27 (11): 3960.
[43] Zabikhulla S Saipov, (2014), "Relations Between Tajikistan and Uzbekistan Continue Downward," *Silk Road Reporters,* December 10.
[44] Bruce Pannier, (2016, February 25), Uzbekistan's New Railway to Isolation, *Qishloq Ovozi, Radio Free Europe/Radio Liberty.* February 25, 2016.

sufficiency but also largely in protest to the CASA-1000 project and any related hydropower development (notably Rogun and Kambarata 1 and 2).[45]

Bishkek has gone head to head with Tashkent too, primarily concerning military buildups at disputed borders and near major reservoirs and hydropower plants close to the Kyrgyz-Uzbek border.[46] Stand offs happen here frequently, with some instances occurring as recently as March of 2016 when Uzbek President, Islam Karimov, sent Uzbek troops to the border in response to alleged security concerns during Nooruz celebrations.[47] The borders of Central Asia were arbitrarily drawn during the Soviet Union, separating ethnic groups and clans and creating tensions between them with independence.[48] Tension lingers from clashes between Uzbek and Kyrgyz ethnic groups, namely the 1990 Osh Riots and the violent outbreak in the south of Kyrgyzstan in 2010. There are also areas of the border that have not yet been properly demarcated and as a result cause conflict at both local and national levels.[49]

President Karimov has long threatened that the actions of his upstream counterparts would lead to war. Between 2010 and 2015 he seemed to be particularly vocal on the subject, through official statements, letters, and appeals to the World Bank and the United Nations regarding the possible negative impacts of both the CASA-1000 project and Tajikistan's heightening of the Rogun Dam.[50] While Tajik officials have made no outright threats, they do continue to assert that the project will move forward

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[45] Ibid.
[46] Cholpon Orozobekova, (2016, April 1), An Absence of Diplomacy: The Kyrgyz-Uzbek Border Dispute, *The Diplomat.* April 1, 2016.
[47] Ibid
[48] Hirsch, Francine. 2005. *Empire of nations: ethnographic knowledge & the making of the Soviet Union*. Ithaca: Cornell University Press.
[49] Pete Baumgartner, (2016, March 23), Uzbekistan, Kyrgyzstan Deploy Troops In Dispute Over Border Mountain, *Radio Free Europe/Radio Liberty, March 23, 2016.*
[50] International Crisis Group, (2014), "Water Pressures," 19.

despite Tashkent's objections. In fact, Deputy Prime Minister, Murodali Alimardon, said that "Tajikistan will generously share the water… as our country possesses over 60% of it," also pointing out that only part of the region "possesses rich water resources while other have hydrocarbons," with the implication that Uzbekistan could make things far simpler by being more open to compromise.[51]

III. WATER SECURITY

Water War vs. Cornucopia

The water war theory has been covered exhaustively in water security scholarship. Prominent expert on water issues, Aaron Wolf, said in an article on the Jordan watershed that "scarcity of a resource as critical to economic and physical survival as water may provide inducement to cooperation over other regional issues in the context of peace negotiations".[52] Wolf and many other scholars have disproven the water war theory, showing little if any basis for it in history and in fact an aim towards cooperation and advancement in technology in the face of scarcity instead.

At a conference of the World Economic Forum on the Food-Water-Energy Nexus Professor of Engineering and Director of the Water Center at Columbia University, Upmanu Lall, noted that humans, having always lived on the fringes of scarcity, have learned to push resources to the ultimate limits with advancing technology to meet social

[51] Wikileaks, (2011 Octobeer 21), "RUSSIA/KAZAKHSTAN/KYRGYZSTAN/TURKMENTISTAN/TAJIKISTAN/UZBEKISTAN – Tajikistan calls for "constructive" water cooperation in Central Asia," The Global Intelligence Files.

[52] Aaron T. Wolf, (2007), "Shared Waters: Conflict and Cooperation", *Annual Review of Environment & Resources,* 32 (1), 14.

and economic needs.[53] But in the face of population growth and water scarcity even advances in technology will reach their limits.

Cooperation vs. Noncooperation

According to Hummel's quantitative analysis of interaction between Central Asian countries on water and energy, cooperation and noncooperation are equally likely. She shows that results can vary according to political climate, historical backgrounds, river basin, and in some cases even seasonally.[54] She calls for future research to look into the purpose behind each party's actions in Central Asia. Frederick Frey also touches on the motivations of actors in a way that I elaborate further on in this paper:

> *"If water were not vital, actors would be less concerned; if it were vital but plentiful, they would be indifferent to others' usages; if it were vital and scarce but equitable distributed, they would feel that all parties were fairly in the same situation; and if it were not shared, there would be far fewer opportunities for actions that affect others and produce conflict."*[55]

Weinthal argues for a two-fold institution-building approach to state building by incentivizing the Central Asian nations with 'side-payments' from International Organizations, bilateral aid organizations and NGOs.[56] Following independence, she says that CAS thought immediately about forming cooperative agreements on water and energy infrastructure but neglected state formation, which should have been their first priority. Long term, Weinthal's theory that incentives help to enforce stability through

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[53] World Economic Forum, Water Security: The Water-Food-Energy-Climate Nexus, 20 May 2011, https://www.youtube.com/watch?v=lIs0_YnHKcM.
[54] S. J. Hummel, *Cooperation, Noncooperation, and Water Scarcity in Post-Soviet Central Asia.*
[55] F. Frey, (1993), The Political Context of Conflict and Cooperation Over International River Basins, *Water International, 18*(1), 55.
[56] E. Weinthal, (2002), *State making and environmental cooperation: linking domestic and international politics in Central Asia*, Cambridge, Mass: MIT Press, 203.

state building in Central Asia is inaccurate. The fact that these agreements were induced by a desire for funding made them temporary and ineffectual—put on for show to Western investors without intention of change, enforcement or follow-through.

International aid does not induce sustainable resource management or cooperation—in some cases it can do the opposite and assists in stabilizing and reinforcing corrupt government by rewarding them for perceived effort instead of tangible improvement. The US State Department claims to have drawn the line with Uzbekistan on human rights, letting them know that improvements in corruption and human rights must occur before further assistance can be given.[57] Rosenblum, in a recent talk at the University of Washington on the importance of Central Asia to US Foreign Policy, stated that in regards to water, Tajik-Uzbek relations have been surprisingly more successful than Kyrgyz-Uzbek talks.[58]

Tragedy of the Commons

Hardin laments the tragedy of the commons, using the example of shared land for cattle grazing and the tendency of cattle owners to use the area to its limits without thought to others who might also need it. Riparian parties experience similar use competition over transboundary water bodies. Hardin's example shows that stakeholders have no reason to use the area sustainably because there is no benefit to sharing but a larger chance that their neighbor might use up the resource before they can. They would rather use it all than defer a fraction of what they might have needed to the next user.[59] Both use the land inefficiently at the cost of depleting it faster than it can be replenished.

[57] D. Rosenblum, "The United States and Central Asia – 25 Years After Independence, Why Should We Care?" 29 February 2016, University of Washington. Seattle, WA.
[58] Ibid.
[59] G. Hardin, (1968), "The Tragedy of the Commons", *Science,* 162 (3859).

Harmon goes a step further in law—and related directly to water—stating that the United States has no obligation to ensure that water reaches downstream Mexico, and in fact they have a moral obligation to use as much water as their citizens require to properly develop and supply the US population.[60] This is called absolute territorial sovereignty and is claimed by many upstream riparians in the case of transboundary water disputes.

Contrasting interests in agricultural cultivation and alternative power source production have created growing tension between Uzbekistan and Tajikistan over their shared water resource. Arguments have reached a critical point over Tajikistan's aspirations to complete the Rogun dam project, a dam Uzbekistan fears will inhibit vital water flow during key agricultural growing months. Both believe their use of the resource to be of greater importance than their counterpart's. Lack of any real consensus has led to a sort of free-for-all use of water resources as of late. The resulting tensions fall directly in line with Hardin's Tragedy of the Commons, wherein those who have access to the resource use it with impunity under the notion that their neighbor will exhaust the water if they do not do so first.[61]

Applied to Central Asia

Following independence, riparian parties in Central Asia have been unable to compromise on water management issues due to conflicting uses of the resource and aspirations to foster economic ties outside of the region. Arsel and Spoor discuss the difficulties of trying to separate politics from the environmental situation in Central Asia

[60] S. McCaffrey, (1996), The Harmon Doctrine one hundred years later: Buried, not praised, *Natural Resources Journal, 36*(3).
[61] G. Hardin, (1968), "The Tragedy of the Commons", *Science,* 162 (3859).

when it comes to transboundary waterways.[62] They cite two common, but false assumptions on security's "relationship to water scarcity and sustainable rural development:"

1. The "just add water" approach—policy-makers think more water would automatically solve all economic, political, and social problems.
2. Associated literature considers water scarcity a threat to national security.[63]

Like Aaron Wolf and David Katz, Arsel and Spoor assert that water scarcity is more likely to lead to cooperation and technological advancement even in the tricky case of Central Asia. They argue that need will eventually trump existing conflicts.[64]

Karthe, Chalov and Borchardt offer participatory management with comprehensive agreements between states, consequences for breaking those agreements, and an agreed upon, legally binding means of pursuing those consequences.[65] But they fail to properly account for the complexities of hydropolitics in the region, making such a cornucopian outcome ideal but difficult to achieve. Many scholars have proposed similar recommendations without addressing what treaties, laws and precedents are already in place and why they have been unsuccessful so far (Janusz-Pawletta, 2015; Schlüter, 2005; Tookey, 2007; Khudayberganov, 2011). This paper takes into account the research of these scholars but builds new recommendations based on the existing treaties, laws and precedents as well as the realities of political dynamics in the region.

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[62] Arsel, Murat and Max Spoor, 2010, "Securing the Future, Democratizing Development: The Role of Water." *Water, environmental security and sustainable rural development: conflict and cooperation in Central Eurasia*, London: Routledge

[63] Ibid, 271.

[64] Ibid, 270.

[65] Karthe, Daniel, Sergey Chalov, and Dietrich Borchardt, 2015, "Water resources and their management in central Asia in the early twenty first century: status, challenges and future prospects," *Environmental Earth Sciences,* 73 (2): 496.

IV. TREATIES, LAWS, AND PRECEDENTS

Based on the information gathered in the previous chapters, this chapter outlines possible courses of action available to the government of Uzbekistan. These are broken up into three categories—litigation, arbitration or mediation, and negotiation—and explained in order from least to most likely option to be implemented by Tashkent in response to CASA 1000. This is not meant to be an exhaustive list of policy options to Uzbek government officials. It does seek to offer a variety of solutions having weighed the pros and cons of each in line with Tashkent's *modus operandi* on not only transboundary water disputes, but other issues of pertinence to the country as well (i.e. human rights).

Scholars dealing with the issue of transboundary water management in Central Asia offer many common solutions but fail to explain how parties would reach or then execute them. This work takes into account the proposed solutions of previous scholars but goes a step further and discusses how they would actually execute those suggestions, showing that some are far less applicable than others. Additionally, the actions offered in the following sections do take for granted that the CASA-1000 project will come to fruition, with or without the agreement and cooperation of Uzbekistan.

Litigation

Seeking resolution of its dispute with Tajikistan and Kyrgyzstan under the auspices of the International Court of Justice (ICJ) is the least likely course of action Uzbekistan's government would choose to pursue. Tashkent acceded to the UN Convention on International Watercourses on September 4th of 2007. But neither

Kyrgyzstan nor Tajikistan has followed suit.[66] The convention confers jurisdiction to the ICJ if other means of settlement are attempted and failed beforehand.

> "2. When signing, ratifying, accepting, approving, or acceding to this Convention, or at any time thereafter, a Party may declare in writing to the Depositary that for a dispute not resolved in accordance with paragraph 1 of this article, it accepts one or both of the following means of dispute settlement as compulsory in relation to any Party accepting the same obligation:
>
> a. Submission of the dispute to the International Court of Justice;
>
> b. Arbitration in accordance with the procedure set out in Annex IV."[67]

While they have not acceded to the 1997 UN Water Convention, Tajikistan and Kyrgyzstan are party to other international treaties employing similar clauses on litigation and dispute settlement. Uzbekistan could use these to build a case showing both to have violated previous agreements on the fair management and distribution of transboundary water bodies. As noted in the previous chapter, Tajikistan is part of the 1998 CIS agreement on the rational use and protection of transboundary watercourses, which uses the 1966 Helsinki Rules as a basic framework.[68] Uzbekistan and Kyrgyzstan are not. In 2001 Kyrgyzstan acceded to the Espoo Convention, which has a clause on dispute settlement using the exact same language as the 1997 UN Water Convention[69].

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[66] Convention on the protection and use of trans boundary watercourses and international lakes, Multilateral, 17 March 1992, United Nations, Treaty Series, vol. 1936. p. 269.
[67] Ibid, art. 22, para. 1.
[68] Ziganshina, 17.
[69] UN Convention on environmental impact assessment in a trans boundary context. art. 15, para. 2. "2. When signing, ratifying, accepting, approving or acceding to this Convention, or at any time thereafter, a Party may declare in writing to the Depositary that for a dispute not resolved in accordance with paragraph 1 of this article, it accepts one or both of the following means of dispute settlement as compulsory in relation to any Party accepting the same obligation: (a)

The Espoo Convention requires signatories to notify and consult with their neighbors when a project may have a significant negative impact on the environment across borders.[70] Notice of the CASA 1000 Project's progression has been widely available through project proposals, feasibility and environmental impact reports, and funding requests. But Tashkent could argue that at least Kyrgyzstan (if not Tajikistan) has neglected to consult directly with its downstream neighbors according to its obligations under the Espoo Convention. Unfortunately, between these three treaties and three countries, there are no overlaps. The 1997 UN Water Convention and 1991 Espoo Convention have similar dispute clauses but they apply only to "parties accepting the same obligation" as signatories of the respective treaties.[71] This leaves the court without a common, unifying international precedent between them upon which to base a decision.

As members of the United Nations, all three have the right to appear before the ICJ should they so choose. This would require consensus among them to use the international court system and subsequently to acknowledge the veracity of the court's decision. Not one Central Asian country currently recognizes the compulsory jurisdiction of the ICJ.[72] As a result, even if they were to appear, there is technically no legal obligation by any party to accept, much less carry out the rulings of the court. There are also no mechanisms in place in the region to ensure that the court's decision is enforced even if the former steps are taken. Although officially recognizing the compulsory jurisdiction of the Court would be in Tashkent's interest in the case of transboundary

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Submission of the dispute to the International Court of Justice; (b) Arbitration in accordance with the procedure set out in Appendix VII"

[70] Ibid, art. 3-5.

[71] UN Convention on environmental impact assessment in a trans boundary context. art. 15, para. 2. & UN Convention on the protection and use of trans boundary watercourses and international lakes. art. 22, para. 1.

[72] United Nations, Charter of the United Nations, 24 October 1945, 1 UNTS XVI.

water disputes, it would also make the government vulnerable to legal attacks on other fronts, namely human rights. Having a poor track record in this area, the Uzbek government is unlikely to open itself up to any sort of legal culpability.

Arbitration and/or Mediation

Arbitration is a more likely approach to the dispute for Tashkent than litigation. Under the Doctrine of equitable and reasonable utilization all three parties could agree to invite a fourth, uninvolved party to act as both mediator and advisor on the issue. The aforementioned treaties include arbitration clauses to be pursued if prior notification and consultation measures do not result in consensus between parties to a dispute.[73] In this case, all three treaties—UN Water Convention, Espoo Convention and the CIS agreement—require signatories to follow these steps regardless of whether or not the other party is also a signatory.[74] In good faith, if Kyrgyzstan and Tajikistan were to take these steps, the onus would be upon Uzbekistan to be responsive during process despite not having a common international precedent between them.

The biggest obstacle to overcome in arbitration would be in agreeing to allow an arbitrator the final say. All three countries employ stances of strict absolute territorial sovereignty both in national law and practice.[75] Kyrgyzstan goes one step further in line with a very literal interpretation of the Harmon Doctrine[76] and a view of water as a

[73] UN Convention on environmental impact assessment in a trans boundary context. Annex IV. & UN Convention on the protection and use of trans boundary watercourses and international lakes. Appendix VII.
[74] Ibid.
[75] Government of Republic of Uzbekistan. (1993). *Laws of the Republic of Uzbekistan: Water and Water Use*. Tashkent, & Government of the Republic of Tajikistan. (2001). *Law of the Republic of Tajikistan: Water Code.* Dushanbe, art. 5, para. 1, & Government of the Kyrgyz Republic. (2001). *Law of Kyrgyz Republic on Interstate Use of Water.* Bishkek, art.1, para. 2, art. 3, para. 3.
[76] S. McCaffrey, (1996), The Harmon Doctrine one hundred years later: Buried, not praised, *Natural Resources Journal, 36*(3), 549-590.

tradable commodity.[77] Any decision by an arbiter seen as impinging on economic sovereignty could go unrecognized by upstream Kyrgyzstan and Tajikistan. Nonbinding arbitration with the aim of reaching an agreement that could build the groundwork for a binding agreement between parties would be the most viable option in dispute resolution on CASA 1000. Still, oversight and enforcement mechanisms in the region are weak and mostly nonexistent. This makes any dispute resolution through arbitration about CASA 1000 precarious at best if it cannot be enforced.

Mediation of transboundary water disputes already in the region would most likely be a more agreeable option to either litigation or binding arbitration. It is also a less abrasive medium. Unlike arbitration, mediation does not call for an arbitrator but an advisor or overseer to negotiations. No concrete decision must be reached by the end, although time constraints sometimes may be applied to encourage parties to meet milestones in the process.

Negotiation

The one thing all parties in Central Asia seem to agree on is that cooperation is vital to improving the situation on transboundary water bodies in the region. Initially, I expected to find that there was not enough cooperation in Central Asia on transboundary water disputes. I found the opposite to be true; there are a number of agreements. The major drawbacks are that few of these agreements include all five riparian states and that, besides ICWC, they have yet to create a unifying framework that includes mechanisms of both oversight and enforcement. One might argue that the number of current agreements shows how little weight they carry in resolving riparian disputes.

[77] Government of the Kyrgyz Republic. 2001. *Law of Kyrgyz Republic on Interstate Use of Water.* Bishkek, art.1, para. 2, art. 3, para. 3.

But treaties are made with two goals in mind: settling a dispute and fostering cooperation in development.[78] They are also voluntary and require compromise, showing that the riparian parties may not be in consensus but are serious about open dialogue and finding a solution. While they may appear to be ineffective in the short-term, treaties like these foster soft laws which can help lay the groundwork for more binding precedents of behavior in the region and hopefully eventually to create tangible laws. These building blocks are vital to the improvement of relations between riparian parties in Central Asia and their abilities to develop their economies in more cooperative ways.

Assuming CASA 1000 moves forward with the appropriate funding and support from project members and international organizations, Uzbekistan's best option is to negotiate an advisory position in the decision-making process of the CASA 1000 project through the planning phases with some amount of veto power, a joint management project of the hydroelectricity dam facilities, or an energy exchange agreement akin to those implemented during the Soviet Union. These can be leveraged in exchange for a promise to implement more conservative use of water in agriculture, soft law and strengthening of the ICWC and treaties on transboundary water rights in the region, and new energy trade agreements. Tashkent could also use its international allies and popular international concerns on major environmental disasters like the Aral Sea to pressure its upstream neighbors not only to give them a say in CASA 1000 but also to be more environmentally mindful through the progression of the project.

V. RECOMMENDATIONS

[78] Seligman, D., Colorado River Commission of Nevada, & Peterson, McClain. 2008. *World's major rivers: An introduction to international water law with case studies*. Las Vegas, NV: Colorado River Commission of Nevada, 6.

The following solutions have been compiled not only for Uzbekistan but for all CAS and also International Organizations looking to invest in or offer assistance to the region. These solutions are by no means exhaustive but were chosen based on courses of action that would be within agreeable means for CAS while still offering International Organizations with methods of supporting CAS without also supporting corruption or misappropriation of funding. Use of any of these methods would hopefully still allow upstream Kyrgyzstan and Tajikistan to foster lasting social and economic ties with their South Asian neighbors without severing ties with Uzbekistan. Through cooperation they would also help to empower the populations of each country and improve economic development, proving that depending on each other for certain things is not equivalent to surrendering national sovereignty. Self-Sufficiency sounds good in theory, but is inefficient in practice. Improvement can be achieved by applying any one or combination of the following:

1. Offering funding only to joint projects of 2 or more CAS or to projects that have included all riparian actors with a vested interest in the body of water to be used for the proposed project in the feasibility and planning steps;
2. Offering priority funding to alternative energy production projects over carbon or hydro-based energy.
3. In the case of CASA-1000 and the dispute between Kyrgyzstan, Tajikistan and Uzbekistan - CASAREM and CASA-1000 membership, advisory positions, volume flow agreement, and assistance in smaller reservoir and hydropower construction in Uzbekistan to offset flooding.

Method 1: Competitive Funding for Joint Projects

According to Hummel, between CAS cooperation and noncooperation in response to water scarcity are equally likely.[79] Of course international organizations should encourage CAS towards the former. This can be achieved by offering funding opportunities only to joint projects that promise transparency in how funds are spent and offer oversight to the international organization providing the money. The project planning phases must involve cultivation of concrete regulations and enforcement mechanisms that are agreed upon by all riparian actors that could potentially be impacted by the project. Repairs to existing infrastructure and plans with a theme of sustainable use and management must also be proven through the planning phases. While agreements on seasonal water releases and fixed energy prices are still worth discussing, these projects would require more in-depth transboundary cooperation between parties.[80]

One example of the possible type of cooperation required would be a joint, state-owned and managed hydropower plant or water sanitation facility at the border between Tajikistan and Uzbekistan (or Uzbekistan and Kyrgyzstan, etc.). In the case of CASA 1000 and the Rogun Dam, current financers of the project could lobby Tajikistan and Kyrgyzstan continue discussions with Uzbekistan on the project, listen to Tashkent's concerns, and try to find a compromise. Offering Tashkent an advisory position on the project might be a good start to finding a diplomatic solution. Adding an additional reservoir and a small secondary dam on Uzbek territory to give Tashkent a feeling of empowerment in the project and control over seasonal flow would also be worth considering in a bid to gain Uzbek agreement to CASA-1000.

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[79] S. J. Hummel, *Cooperation, Noncooperation, and Water Scarcity in Post-Soviet Central Asia,* 12-16.
[80] Ibid, 8.

Method 2: Alternative Energy Funding

International organizations should encourage CAS to diversify sources of energy away from traditional carbon-based sources. But they should not paint hydropower as the perfect alternative. Hydropower has its own environmental tradeoffs that must be considered in the planning of new and renovated dams in Tajikistan and Kyrgyzstan. Sedimentation buildup and siltation (which influence dam efficiency and the river ecosystem), changes in flow and water temperature, and how these changes alter the biodiversity of rivers are all important factors in planning.

Central Asia during the Soviet Union was home to the construction of too many hydropower dams without proper planning for the inevitable decommissioning process. Upstream shortages of energy and downstream extremes of winter flooding and summer water shortages can be largely attributed to the shortcomings of short-term Soviet planning in the region. Also, hydropower does not store long-term, so it must be used soon after being generated. Therefore, international actors should not encourage CAS to see hydropower as the catchall solution to energy shortages.

Solar power would be a great alternative. Solar power production can be implemented on a small scale, giving individuals and communities direct control of the resource. There is also an opportunity to transmit surplus energy to the grid and provide these communities with an additional source of income. While this is not a source that could immediately phase out hydropower production, it would complement and help to reduce dependency.

Converting construction plans for Rogun in Tajikistan or Kambarata 1 and 2 in Kyrgyzstan to produce a solar-hydro hybrid station, similar to China's Longyangxia

station could be a compromise between upstream and downstream parties to start. Longyangxia station is linked to a solar park that can produce up to 1280 megawatts of electricity annually and has an estimated 25-year life span.[81] Brazil is also discussing floating solar panels at their Sobradinho and Balbina dams "to reduce water loss while reservoir water boosts photovoltaic efficiency by keeping the solar units cool."[82] Implementing similar innovative projects could not only help to reduce tensions over possible withholding of water by upstream parties, but also make alternative sources of energy less variable and at the same time more attractive to donors and governments.

Method 3: CASAREM Membership, Advisory Status, Volume Flow Agreements and Offset Methods

CASAREM was created to foster an energy trade relationship between Central Asian and South Asian states. As a CAS, Uzbekistan has the right to actively participate in this group. As a gesture of goodwill, CASA-1000 members should offer Tashkent an advisory position on the project. This position would allow Tashkent oversight, input, and possible veto power on any plan it views as a serious risk to downstream interests. If Tashkent were to refuse the position, the next logical step would be for Tajikistan and Kyrgyzstan to sit with Uzbek officials and commit to an exact volume of water to flow downstream within such an amount of time as to meet Uzbekistan's needs and alleviate fears of water shortages during growing seasons.

In addition, to alleviate concerns about winter flooding downstream, CASA-1000 members and the World Bank could assist Uzbekistan in the funding and construction of

[81] International Hydropower Association, (2015), 2015 Hydropower Status Report. 4.
[82] Ibid, 38.

a smaller dam and reservoir scheme to control seasonal flow on their side of the border and offset summer shortages in the future.

VI. CONCLUSION

A long-term solution to the water dispute is impossible unless Kyrgyzstan, Tajikistan and Uzbekistan can find a way to work together. Tashkent is unlikely to use of the International Courts as a means of dispute resolution because doing so could open the Uzbek government to international scrutiny on other fronts that it is not yet ready to address. Therefore, resolution through bilateral and regional agreements as well as joint projects facilitated by international financial institutions is more likely to show results.

Treaties of the past, in which parties agree to disagree or to discuss the problem and potential solutions further down the road, are no longer sufficient.[83] Any agreement between CAS will require active participation by all parties and willingness to compromise. With growing concerns about upstream water diversion, Uzbekistan can no longer ignore Tajik and Kyrgyz aspirations to achieve self-sufficient energy. With this in mind, it seems to be in everyone's best interest to revisit the possibility of reviving a system of mutually beneficial exchange similar to the one employed during the Soviet Union.

This can be achieved through subsidized pricing of hydrocarbon energy in exchange for seasonally timed outflows that match Uzbek needs or exchange of excess power generation for Uzbekistan in the summer months and Tajikistan in the winter months. An energy exchange will cut down on costs for both countries. The construction and upkeep of brand new hydropower plants is far more expensive. In this case self-

[83] Timo Goeschl, "Distributive Constraints on Environmental Policy in Central Asia," in *Environmental Problems of Central Asia and their Economic, Social and Security Impacts,* ed. Jiaguo Qi and Kyle T. Evered (Dordrecht, NE: Springer, 2008), 322.

sufficiency is less efficient than outsourcing. Additionally, CAS should be working to diversify their energy resources to prevent the possibility of shortages in the future.

Using one or any combination of the solutions offered in this paper would help to promote cooperation between CAS on water management, combat corruption and the improper use of funds. The second solution might be the easiest to start with. Rather than scrapping all hydropower projects in the region right off the bat, this solution offers Kyrgyzstan and Tajikistan the opportunity to experiment with alternative energy sources that can be used to compliment hydropower and make its product more reliable. They could then become trendsetters in alternative energy production. Offering their citizens the option of having their own solar panels to produce energy for their home and, if they wish, to export excess energy to the national grid for a small income would help to combat poverty as well.

The third solution, while not as easy as the second, would also be a worthwhile step for the three nations. International Organizations have contributed large amounts of funding to updating irrigation infrastructure and water sanitation in each country. It is time for these organizations to contribute not to individual countries but to group projects covering the basin or river as a whole. CASA-1000 is an opportunity for Tajikistan, Kyrgyzstan, and Uzbekistan to create not only new trade relationships with South Asia and with each other, but also to make new, real regional water management regulations a priority. With the right compromises (which would be achieved through the solutions provided in this paper), all three could potentially benefit from the project. Most importantly, they would have to understand that the value derived from their water

resources is far more important than any agreement they could come to on an exact allotted volume per country.

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