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Artigo

Water and climate change: a sign of war or a chance for cooperation? A comparative study between Central Asia and South America

Água e mudança climática: um indício de guerra ou chance para a cooperação? Um estudo comparado entre a Ásia central e a América do Sul

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Barbara Magalhaes Teixeira[1]

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Abstract
Different than the traditional body of work of this field that claims water scarcity leads to conflict, or to another line of research that claims water scarcity actually leads to cooperation; this article proposes a different causal mechanism that links the importance of the pattern of relations existing between countries prior to climate change and resource scarcity to try to explain why water scarcity causes conflict in some cases and cooperation in others.
Keywords*: Conflict; water scarcity; climate change.*

Resumo
Diferentemente da linha de estudo deste campo que alega que escassez de água leva ao conflito, ou à outra linha de pesquisa que afirma que, na verdade, escassez de água leva à cooperação; este artigo propõe um mecanismo causal diferente que liga a importância dos padrões de relacionamento existentes entre os países antes das mudanças climáticas e escassez de recursos, para tentar explicar porque escassez de água causa conflito em alguns casos, e em outros causa cooperação.
Palavras-chave*: Conflito; escassez de água; mudanças climáticas.*

1. Barbara is pursuing her master's degree at the Department of Peace and Conflict Research at Uppsala University. Orcid:

Introduction

Since the end of the Cold War and the fall of the bipolar world order two major changes have been made when dealing with the concept of security and the arena of interaction between states. The first is the broadening of the concept of security, which we now know has to be able to deal with a lot more possible threats due to the different perception of the actors, the actors themselves, as well as with the new emerging security threats. The second is the regionalization, in which we observe that actors interact much more often and intensively with their neighbors than with countries that are geographically far away. These two characteristics that we observe to be so important right now have been masked by the bipolar world order and the constant clash between the super powers during the Cold War.

Since the broadening of the security agenda in the Post-Cold War period, many new issues have emerged as potential security threats that couldn't be highlighted before because of the obsession with, and terror of, nuclear war. Nowadays, issues like climate change, food security and health have been understood to have a link to the onset of conflict. In this paper, and with this mindset of broad security agenda and regionalization, I will explore the effects of climate change, specifically of water scarcity, to the likelihood of conflict between countries that are geographically close. For this, I will use theories of how climate change can affect the availability of resources and affect the interactions between neighboring states, especially because they share those resources. This will be a comparative study, since the question that I am trying to answer is: ¨why shared water resources can lead to conflictive interactions between neighboring states in a region, and lead to cooperative interactions in another region?¨ I will use the case of Central Asia, the basin of the Aral Sea and the rivers Amu Darya and Syr Darya, and compare it to South America, using the basin of Rio del Plata and the Guarani Aquifer to try to understand how water scarcity relates to the interaction between states.

This paper will be structured as follows: the first section will present explanations to theories and both hypothesis; the second section will contain the research design and the operationalization of the variables; and the third section will outline the application of the theories to the cases selected. Finally, the conclusion will be drawn upon comparison of the cases and there will be a final presentation of the findings of this study.

Water, climate change and conflict

There is a big debate within the field between the role of shared water resources and the relationship of the countries that rely on them. On the one side, some scholars affirm that water can lead to conflict, especially in this age of climate change and water scarcity. There is a vast literature that explores this hypothesis that the more the climate change advances, and the faster the process of industrialization gets, the harder it will be to have a sustainable management of the fresh water resources for everybody equally. As it is known, fresh water is a natural resource that is spread across the planet, but not equally. As a result, some countries ended up having more water resources than others; the largest quantity of water can be found in the northern temperature zone, where the smallest portion of the population is located, and there is a scarce amount of water in the tropical and arid regions of the planet, where most of the population lives (SWAIN, 2015).

The problem that derives from this unbalanced distribution of water, the single thing that is

essential to human survival, is that the resources of the river basins and aquifers don't follow man-made borders. From the 197 countries in the world, 145 have territories with at least one shared river basin, and the Transboundary Freshwater Dispute Database of Oregon State University shows that about half of all the fresh water on the planet is accessible through these internationally shared water resources (TFDD, n/d). Water scarcity can become an issue over which countries fight because of the unequal distribution of the resource, as well as the different needs and uses of each actor.

Developed countries and less populated ones have had the technology and the money to invest in renewable resources of energy instead of relying on hydropower, and have stopped building dams as a way to regulate the quantity of water; but on the other hand, developing countries are the ones that use most of the water to feed their basically agricultural industry, and the rapidly growth in their population also poses a threat to the sustainable use of water (SWAIN, 2015). In this way, we could see how climate change and the irresponsible use of water resources could lead to its scarcity, and how this could emerge as a threat, not only to the states' survival but to human security. Even though this is a plausible claim that makes a lot of intuitive sense, there hasn't been any record of conflicts fought over water so far, only verbal attacks and threats of use of force.

On the other hand, another line of argument posits that competition over scarce shared water resources could lead to cooperation between the states, instead of conflict over it. This time with strong empirical results, Yoffe, Wolf and Giordano's (2003) "Basins at Risk" project show that instead of making countries more prone to fight their neighbors over scarce shared water resources, this environment led the neighboring countries to invest in cooperation efforts to manage and control the use, quantity and quality of the river basins. With the combination of the work of the Basins at Risk and the Transboundary Freshwater Dispute Database, the creation of the Water Event Intensity Scale (WEIS) helped analyze the interactions between states related to shared water resources, and this allows us to observe that more than two thirds of the over 1,800 water events are closer to the 'cooperative' end of the scale than to the 'conflictive' one. Even so, the ones that are characterized as being on the 'conflictive' side of the scale can only qualify as mildly conflictive (YOFEE et al., 2003).

Even though there exists credible empirical data to show that scarce shared water resources lead to more cooperative interactions, it seems imprudent to discard the link between water and conflict, even if it is something that can happen only in the future. With this in mind, this study aims at finding other reasons that could explain this complex phenomenon.

In his article from 2015 titled ¨Climate Change: Threat to National Security¨, Swain presents a new perspective to link climate change and related phenomena with conflict. He states that instead of framing climate change issues as a direct cause for conflict – which we know it is still early to claim – it can act as a ¨threat multiplier¨ (SWAIN, 2015). He poses that climate change and the related issues cannot in themselves directly cause conflict, but they can intensify tensions over other issues that already exist. Climate change can modify the weather characteristics of semiarid and tropical regions, affecting directly the livelihood of millions of people. It can cause desertification in former fertile lands, the rising sea levels affect the existence of the small island states, and floods affect both agricultural activities but also threat housing infrastructure.

These changes in people's livelihood can lead to conflict in a number of different ways, from creating migration flows into other countries and

increasing the rapid and unplanned urbanization of major cities, to intensifying disputes over territories with scarce natural resources or cattle and food raids between farmers/villagers because of food insecurity. Naturally, these conflicts over scarce resources and fertile lands will intensify between neighboring countries that have unresolved demarcations and claims to territories. In this scenario, the relationship between states within a given region will be more important given their geographical proximity. As posed by the Copenhagen School, threats travel more easily through short distances, and this makes the regional states' interactions the center of attention when climate change issues emerge as security threats. Given their geographical proximity, conflict over territory and natural resources will be more likely between neighboring countries than between countries that are geographically distant (BUZAN, 1991).

As seen before, climate change issues are not drivers for conflict on their own, but they will act as threat multiplier when combined with previous conflicting issues between the states. In this way, we can say that climate change issues will intensify the pattern of relationship already existing between neighboring states, in other words, if there are already disputes over territories between neighboring countries, climate change will intensify their conflictive interactions. In the same way, this works in the other direction: in a scenario where the pattern of relationship between the countries is friendly, climate change will drive the states into cooperation to protect the scarce shared resources instead of fighting over them. In relation to the discussion outlined above, the shared water resources that are transboundary between neighboring states have a central role in affecting their relationship in the regional scenario. When climate change affects the freshwater resource, if the neighboring countries that rely on that shared resource have a pattern of enmity between them, it is more likely that they will have conflicting interactions than cooperative ones. In this way, we can infer our first hypothesis:

H1: the presence of shared water resources is more likely to lead to conflictive interactions in a region where the pattern of relationship is enmity.

In the other direction, our second hypothesis states that:

H2: the presence of shared water resources is more likely to lead to cooperative interactions in a region where the pattern of relationship is amity.

Central Asia Case Study

Even though research says that there is no record of conflicts fought over water, this issue is central to the countries of Central Asia, and it is a major source of tensions and insecurity. Amongst the securitized issues in the region, like drug trafficking, terrorism and border delimitation, water management is at the top of the list as threats to the security in Central Asia (OSCE, 2017). The region is provided with water by the Aral Sea Basin, which comprehends the two most important rivers in the area Amu Darya and Syr Darya, responsible for 90% of all the water in the region (ICG, 2014). Both rivers are born in the mountainous area to the east of Central Asia in Tajikistan and Kyrgyzstan, go down to the border with Turkmenistan and Uzbekistan, fertilizing the valley area, and continue to the northwest to flow into the Aral Sea.

Both Tajikistan and Kyrgyzstan have the advantage of the combination of the mountainous terrain and the abundance of the rivers, which makes both countries rich in hydropower electricity. However, they are also the poorest countries in the region, and are actually almost unable to provide stable energy to their populations during winter. They have also been affected by droughts in their water supply due to climate change (ICG,

2014). Uzbekistan, Turkmenistan and Kazakhstan are the downstream countries and thus, are rich in minerals that are brought along with the river, but they also are the most affected by water shortages. Turkmenistan and Kazakhstan have other sources of water outside of Central Asia, but Uzbekistan is a landlocked country that relies entirely on the supply from the Amu Darya and Sur Darya rivers for its cotton crops.

Even though both Kazakhstan and Turkmenistan are affected by the management – or lack thereof – of the water by the upstream countries, researchers agree that the main source of insecurity in the region lies in Uzbekistan, and its troubled relationship with Kyrgyzstan and Tajikistan. This is due not to the issue of the shared water resources or the threat of water shortage because of climate change, but because of the combination of this issues with underlying historical enmities between ethnic groups. The most contested area in the region is the Ferghana Valley, a very fertile area where the three states meet. In total, they share almost 4,000 km of borders, but 961 km of them are contested, and they are located in the Ferghana Valley region. The tensions are historical because of territorial disputes and allocation of people, but it has been aggravated by the issue of scarce water resources lately. Since the collapse of the Soviet Union, Uzbekistan has positioned itself as an emerging leader in the region, trying to shift the balance of power in its direction (MUSIOL, 2015). It has an authoritarian government that has been aggressive many times against its neighbors mainly because of the enclaves of ethnic Uzbeks inside of Kyrgyzstan, and because Tajikistan has recently reoccupied the Farkhad reservoir and part of territory that was lea-

Figure 1. Water resources of the Aral Sea Basin
Source: http://www.cawater-info.net/aral/i/vod-res-bam-e.gif

sed to Uzbekistan during the Soviet era. The reservoir is important for agriculture for both countries, and this resulted in Uzbekistan closing down some railways connecting the country to Tajikistan and Afghanistan, which their neighbor accused them of blocking the country to destabilize them economically (MEDREA, 2012).

There have been many clashes between the armies in the border, mainly due to high militarization, but recently water supplies have become target. There has been record of Tajik forces that fired grenades and mortars into Kyrgyz territory aiming at the Torktul reservoir, that provides water to the central cities in the region. Later, Kyrgyz guards fired into the air to disperse some 30 Tajiks building water pipes in contested territory, resulting in one death and eight wounded. The retaliation continued between the countries in the border by firing mortars to each side[2]. Local experts also note that conflicts over water are common in the rural areas, especially between the border people that live off of agriculture and depend on farming. In this case, we can see that the majority of the tensions are between inter-ethnic groups in the region, but the issue of scarce water resources, especially in the summer, are threatening to spiral out of control (ICG, 2014).

Even though the pattern of enmity in the region is high, and the tensions over shared water resources appear to affect even more the conflictive interactions, there are also attempts at creating a more cooperative environment between the countries in the region, if not multilaterally, at least bilaterally. Kyrgyz authorities and engineers point out that Uzbekistan often provides assistance with machinery to clean the canals and to maintain infrastructure of the pipes. International donors also work in the region with canal cleaning and building infrastructure as a way to engage the locals in a joint activity, so that they cooperate to preserve the water resources that is so precious to their livelihood in the region and to ease the ethnic tensions (USAID, 2011; SDC, n/d). However, local experts affirm that while these projects are necessary, they do not address the underlying problems of the fear of shortage of water, especially in the summer, due to the lack of institutionalization of the joint water management in the region, and high level of mistrust between the groups (ICG, 2014).

South America Case Study

South America is a region in the world that is vastly rich in freshwater resources. It hosts two of the largest river basins in the world, and it is privileged with the abundance of water, auspicious climate and fertile lands. The Rio del Plata Basin, the 5 largest in the world, is shared by 5 countries in South America: Brazil, Argentina, Uruguay, Paraguay and Bolivia. It consists of 3 major rivers that supply water, the Paraná River, the Paraguay River and the Uruguay River. When the Paraná River is joined by the Uruguay River, they become the Plata River, giving the name to the basin. The basin is of major importance for the five countries, since 4 capitals of the 5 countries are comprehended in the basin, as well as the city of São Paulo in Brazil, the largest in South America. Being this large and comprehending this many cities, this means that an amount of 100 million people in the 5 countries depend on the shared water resources of the La Plata Basin (CAHLMAN, 2008).

It is estimated that the hydroelectric potential of the Plata Basin is 100,000 MWh, of which only half is being utilized as of now. There has been the construction of approximately 75 dams along the rivers in the basin, of which the largest three are

2. All of these incidents are coded as "conflictive interactions" in this study, but they do not make it as "armed conflict" because of the 25 battle-related deaths threshold stipulated by the UCDP (Uppsala Conflict Data Program).

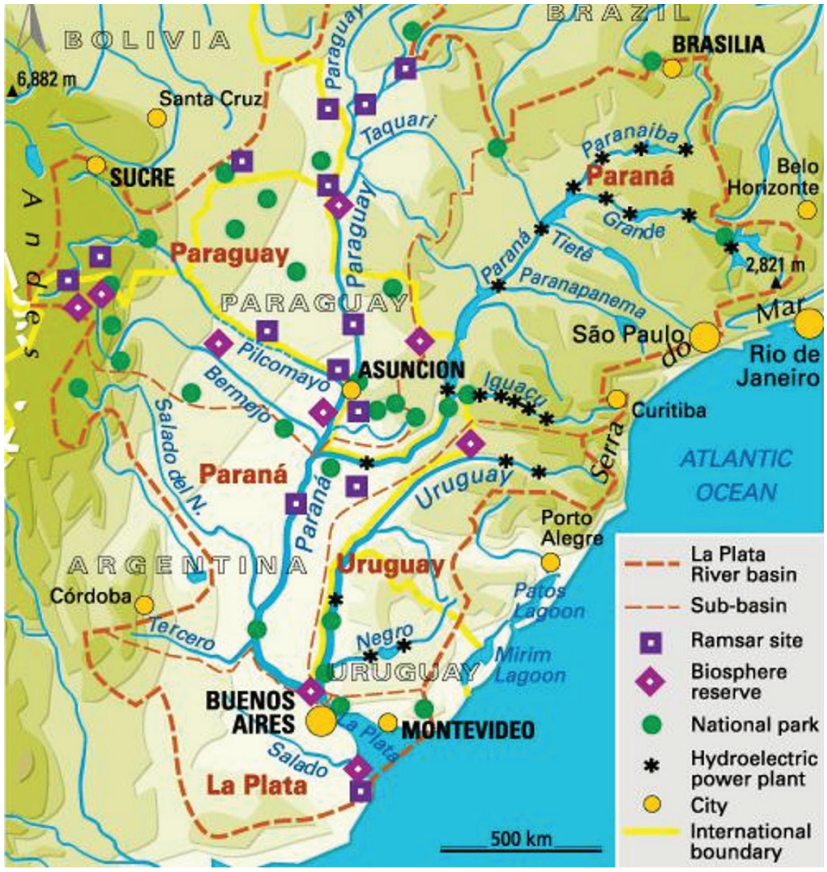

Figure 2. Rio del Plata Basin

Source:http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/SC/images/img_cs-map_wwdr3_plata_big.JPG

all binational. The Itaipú dam, which was the largest in the world until the middle of the 2000s, is shared by Brazil and Paraguay, the Salto Grande is shared by Argentina and Uruguay, and the Yacryetá is shared by Argentina and Paraguay (FLINKER, 2012). The construction of the dams and the sharing of energy hasn't always been peaceful and cooperative, generating many conflicting interactions between the states in the region, but none of those incidents led to even the threat of use of force. All of the disputes were resolved peacefully, many were even brought to the International Court of Justice because of the any treaties signed in the region regarding the sharing of the water resources, but all of them have been resolved peacefully through cooperation agreements (CAPALDO, 2009). The biggest case is the one of the construction of the Itaipú Binacional between Brazil and Paraguay in 1975. Brazil´s initial intention was to build a canal in Brazilian territory to change the course of the Paraná river before it could get to Paraguayan territory, this way, they could build the hydroelectric power plant without having to share the energy with their neighbor. These plans were not accepted by Paraguay, which would see a tremendous loss of quantity of water into their river and territory, and the solution was the creation of the binational agency for hydropower water, in a more auspicious place at the border, that generates much more energy than first expected (CAHLMAN, 2008).

Climate change and shortage of water are issues that are affecting the Rio del Plata River Basin like everywhere else in the world. Even though the Basin is supplied by the Guarani Aquifer, the largest one in the world, which has an enormous capability to replace the underground water, in the

last years it has been affected by unprecedented droughts in the region. The levels of the reservoirs were below the minimal for two years from 2014-2016, which led the government to issue a state of rationing in São Paulo, the most populous state in Brazil. The drought was due to the unusual lack of rain in the rainy season, but, more than that, it was the mismanagement and lack of infrastructure of the government to deal with the crisis, and the ever-increasing unsustainable use of water. Due to climate change, the region has experienced rising temperatures, which means drier winters and hotter summers. In Brazil alone, in 2014, the water consume increased 30% in the summer, because of the high temperatures, and because all of the 3 main rivers in the Del Plata Basin are born in Brazil, this affects the other countries directly, not only for the generation of electricity, but also for their supply of water (ZIEGLER, 2015).

Even though climate change and scarce water resources are starting to become a real threat in South America, a continent that was so sure that their water resources were infinite, it is unlikely that this will lead to conflict between the countries. South America has a history of peaceful collaboration between the countries, and has seen the last territorial conflicts in the 19th century. Besides that, the shared water resources in the Del Plata Basin are firmly preserved by several multilateral and bilateral treaties, as well as the constitutions of the five riparian countries. The five riparian states have also created the CIC, a coordination initiative between the countries on the Del Plata Basin, to promote the articles of the treaties, and every new construction and project on the basin, or that will affect the basin, has to be approved by the committee (CIC, n/d). On this context, we can observe that, even though the climate change is becoming a threat to the livelihood and survival of the five countries in South America, it is very unlikely that this might lead to armed conflict between them. We can assert that, even though distinct interest of the five countries might lead to some conflictive issues over how to act on the shared resources, they tend to resolve peacefully and to follow the treaties and regional institutions created to deal with this issue. Even though climate change and the increasing threat of water shortage might be a problem, this brings the countries of the region together to cooperate and find a collective action plan, instead of driving them away from each other.

Conclusion

The aim of this study was to find an explanation to why scarce shared water resources lead to conflictive interactions in some cases, and in others it promotes cooperation. We used the two cases of Central Asia and South America to illustrates the two types of actions that can result from climate change and shortage of water. In the first case, that of the countries in the Aral Sea Basin, we saw that scarce shared water resources act as a ´threat multiplier´ to other types of tensions and issues between the countries. Water on itself is not the main driver of conflict between the countries, but it exacerbates other tensions that are present in the region. Central Asia has a history of ethnic tensions and disputed borders that cause trouble on their own, when we add the ´water shortage issue´ it intensifies the negative relationship between the countries. We even saw that, countries like Turkmenistan and Kazakhstan that don't have ethnic tensions and border disputes with Tajikistan and Kyrgyzstan are able to resolve issues of water management and sharing peacefully through treaties.

In South America, the Del Plata Basin is essential not only to the climate balance in the region, as well as for the flora and fauna, fishing, cattle industry and agriculture. The major cities of the region are

supplied by the basin, and recent droughts caused by climate change have threaten the abundance of water to the 5 riparian countries. We were able to show that, because of the peaceful coexistence between the countries in South America and the lack of conflicts between ethnic groups or territorial disputes, the pattern of relationship allows the countries to come closer to cooperation over issues like water shortage, instead of creating conflict.

Both cases illustrate that climate change is a real threat that can have serious consequences for the livelihood of millions of people, and that water shortage can work differently depending on the already existing tensions between ethnic groups and territorial disputes, or it can act as a way into cooperation between countries that have peaceful relations.

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