Peace as a Strategy for Planning Water Secure Futures

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Abstract: Pursuing water security within a framework of peace carries the unexploited potential for the attainment of political stability and sustainability as water crisis scenarios around the world are deepening. Applying the concept of water security also provides a platform to examine the pivotal interlinkages between water, societies, and sectors. The existing literature uncovers a correlation between the level of water cooperation and inter-state relations, and water facilitation in post-conflict reconstruction and development programs as an integral component for sustainability. Limited notions of water security undermine the untapped potential of water within the dialogue of environmental peacebuilding and threaten to reinforce a partisan context of water conflicts. Noting that both at a global and local level, peace and political stability dimensions are noted to have a reciprocal relationship with water, we present a synthesis that builds diverse narratives towards a holistic and intersectoral understanding of water's role in cooperation, conflict, and political stability. The assumption that factoring the water security thinking has the potential to aid in planning water-secure futures while managing uncertainties that operate in socio-cultural, socio-economic and socio-political settings are embedded in the narratives presented in this study. In addition, the study comments on the dynamics of the emerging nexus of water, peace, and political stabilityby employing aset of case studies: the Cochabamba water crisis, transboundary water sharing conflicts and cooperation episodes in the Jordan Basin, and the Syrian conflict analysis. Overall, the script explains how water can be exploited for both cooperative and conflictive outcomes. And, this content analysis calls for providing water users and managers with enhanced knowledge frameworks and improved capacity in the context of the water-peace-political stability nexus. This synthesis will also assist to maximize the latent peacebuilding potential in planning water-secure futures for states and communities.

Keywords: Future; Strategy; Peace; Political Stability; Water-Security.

Introduction

Freshwater is a universal resource facing unprecedented stressors across the globe. The *Global Risks Report 2019* places "water crisis" as one of the top five global risks in terms of impacts with the highest societal risk [1]. This risk is compounded by the interdependency of transboundary and shared water systems between communities, states, economic sectors, and the environment. Around 40% of the global population resides in 270 shared river basins, and some nations receive greater than 75% of their freshwater from upstream riparian states [2]. Across the globe, between 1.5 to 2 billion people experience physical water scarcity every year [3]. The challenges to water security are one part of a problem linked to water governance. The World Water Forum (2003) notes that water challenges are also a "crisis of governance", and to approach water scarcity as a water quantity issue is insufficient to address the structural challenges relating to water scarcity [4, p. 15]. The stressors influencing water security form a complex relationship between natural and social factors. These diverse challenges are faced by various socio-cultural and socio-political populations across the globe.

Utilizing an interdisciplinary and holistic framework of water security is one means to address water crisis-related challenges. Understanding peace and political stability in the context of water security for states and transboundary water systems remain a relatively under-investigated area. A dual narrative exists in the media and academia that observes water as both an element of peace and of conflict. Water's potential as an instrument of environmental peacebuilding is illustrated, and the potential for water in environmental peacebuilding is explored in

the context of water crises and related conflicts, water cooperation settings and post-conflict periods. Peace is translated as a strategy for planning water security within the emerging relationship between water, peace, and political stability.

This synthesis paper examines water's relationship to peace and political stability while providing a deconstruction of the emerging water-peace-political stability nexus. The dynamics between water, peace, and political stability must be understood independently before it can be implemented with other factors of water security. To this end, this paper derives from the UN Water's Water Security conceptual framework (2013) that highlights the significance of peace and political stability to attain water security. The aim is to provide a platform to investigate the interlinkages between sectoral water needs within the larger watersecurity-related goals and targets. UN Water (2013) has developed a definition of water security:

> *[Water security is] the capacity of a population to safeguard sustainable access to adequate quantities of acceptable quality water for sustaining livelihoods, human well-being, and socio-economic development, for ensuring protection against water-borne pollution and water-related disasters, and for preserving ecosystems in a climate of peace and political stability.*[5]

UN Water's definition of water security uses governance, financing, transboundary and domestic water cooperation, alongside the dimensions of peace and political stability as enabling factors for water security. These enablers can be used together to address water management challenges such as water provisioning, adaptation to water-related hazards, ecosystems services/watershed protection, and managing competing water needs between sectors (see Fig. 1 circled red). This water security framework incorporates the interdependency of enablers (see Fig. 1 circled blue) to account for all factors impacting water security. Illustrating the interplay between all four enablers remains pertinent, however that dimension is outside the scope of this synthesis.

A content analysis is the methodological approach used in this study. Up-to-date synthesis articles, UN reports, and commentary from International Non-Governmental Organizations are all reviewed, and the merits and challenges of state and transboundary water sharing mechanisms were analyzed in the context of peace and political stability. Other components within this conceptual framework of water security are fundamental, however not included in this synthesis, as the objective here is to deconstruct the relationship between water, peace, and political stability for better clarity and enhanced understanding.

The two narratives of water in peace and conflict are studied while considering the scale of water security extending to both domestic and transboundary contexts. The case study approach is applied to provide an empirical context to the above stated main objective. The Cochabamba water conflict, Bolivia (1999-2000), is the local case example used. This case expresses how a limited approach to water security that only focused on one sector, in this case, the economic sector, can fail. The second example is the transboundary water interactions of the Jordan Basin from the post-1994 Israel-Jordan Peace Treaty. The post-treaty period up to today is characterized by Israel and Jordan exploiting the basin's water supply beyond sustainable levels, and marginalizing basin actors, such as the Palestinians, is deteriorating the level of peace and political stability in the region. The final case example is the Syrian Civil War. The Syrian Civil War analysis is used to demonstrate how water is still misunderstood and misattributed as a conflict driver. These three case examples demonstrate how water security relates to conflict in both domestic and transboundary contexts and how the role of water in conflict is often misconstrued.

This paper then turns to present a gaps and needs discourse on the relationship between water, peace, and political stability. The avenues to address the knowledge gap surrounding the interlinkages between the enablers and the water use sectors of the water security conceptual framework. Peace and political stability are explored through the UN Water Learning Center's (WLC) training on Global Water Security and the Economist's Blue Peace Index (BPI). WLC offers a platform to strength capacity on operationalizing the conceptual framing the UN Water's (2013) synthesis(https://wlc.unu.edu/courses/course-v1:UNU-INWEH+INWEH-01+2019/about) The BPI provides a synthesized index between the social and natural sciences. Incorporating the interlinkages between elements needed to advance the dialogue and decode the emerging nexus between water, peace, and political stability, BPI offers potential to this discourse.
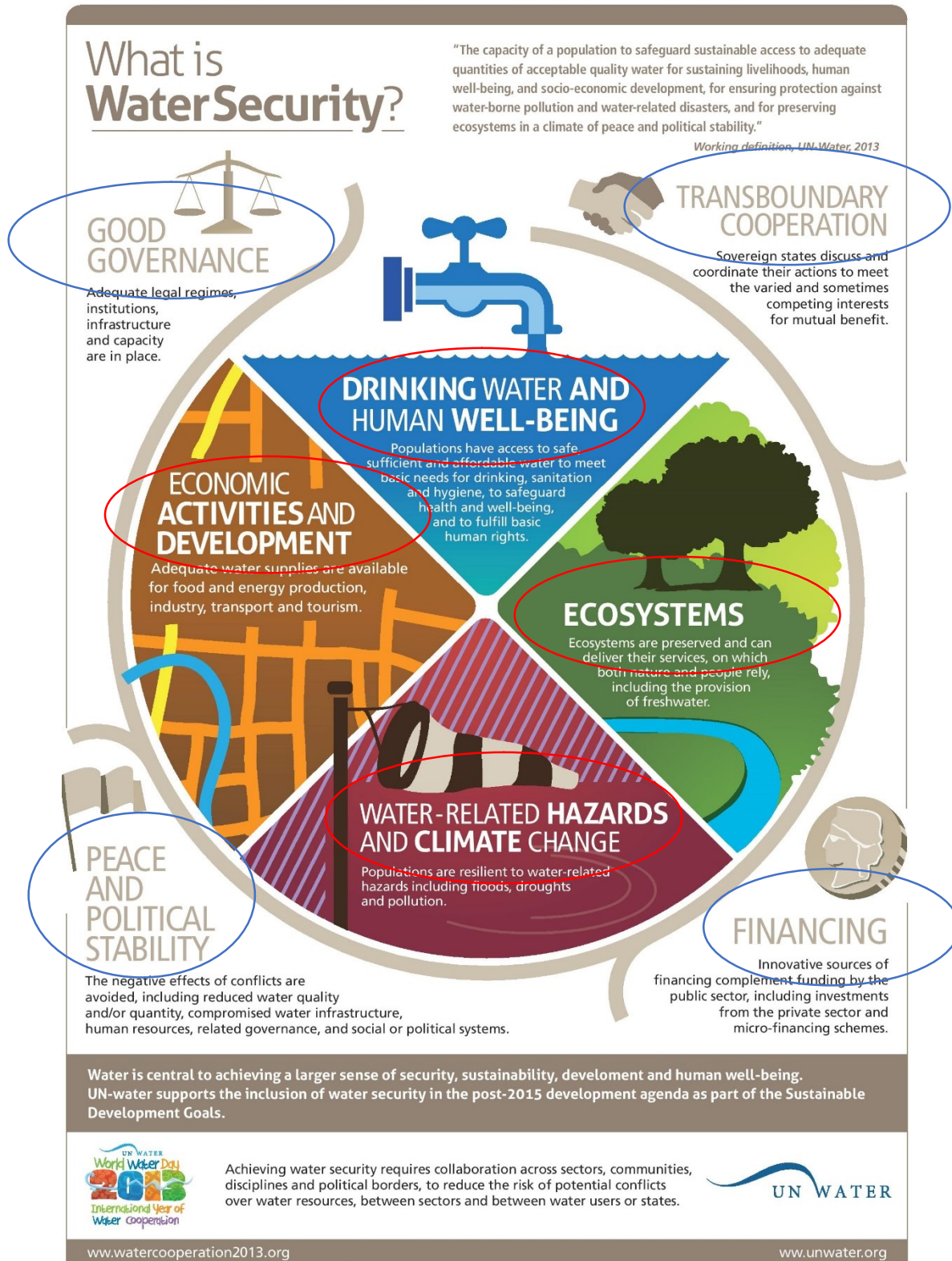
Figure 1: UN-Water's "Water Security" Definition. Source:
https://www.unwater.org/publications/water-security-infographic/

Water, Peace, and Political Stability—The Emerging Nexus

The emerging nexus between water, peace, and political stability is gaining greater recognition on a global scale. One reason for this rise is the relevance of the nexus to peacebuilding and conflict mitigation both for intra- and inter-regional issues. *A Matter of Survival* is one such flagship example of the emerging literature exploring the prominent link between water and peace. Geneva Water Hub published this report with 15 UN Member States to initiate the creation of the Global High-Level Panel on Water and Peace [6]. However, this developing awareness continues to battle against an entrenched narrative of water's role in conflict.

There is a well-documented history of water's role in peace and conflict. The Pacific Institute compiled a "Water Conflict Chronology" dating back to 3000 BC to categorize all events related to water and conflict. The chronology classifies the relationship of water to a dispute as either a trigger, weapon, or casualty and totals 926 conflicts within the database [7]. In contrast, UNEP documents more than 3,600 water treaties [8]. The well-documented history of water treaties and water's relationship to conflict is a foundation for water being interpreted in peace and conflict.

Frequency of Resolution to International Water Disputes 1946-1999

- Formal War; 0
- Military Acts; 56
- International Water Treaty; 157
- Hostile Acts; 56
- Military Support; 7
- Non-military Agreement; 436
- Verbal Hostility; 414
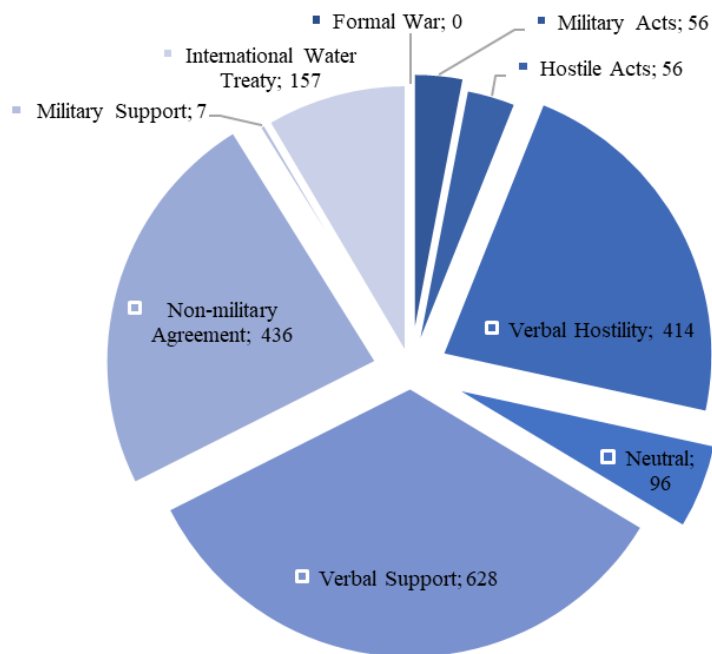- Neutral; 96
- Verbal Support; 628

Figure 2: Adapted from Wolf, A. T. Et al. (2006). Water can be a pathway to peace, not war. Navigating Peace, 1, 1-6.

The current dialogue around water security continues to carry the two opposing narratives of water in peace and conflict. More recent documentation of transboundary water interactions from 1946-1999 by researchers at Oregon State University discovered that the "*rate of cooperation overwhelms the incidence of acute conflict*" [9, p. 3]. A continuation off of this study by Wolf et al (2010) documented that over 70% of all cases between 1948-2008 are instances of cooperation over shared water resources [10], [11]. Fig.2 demonstrates how cooperative interactions over shared water resources can take many forms. Even so, when water is attributed to conflict its role is often misunderstood in oversimplified generalizations. Media outlets routinely capture the notion of "water conflicts" worldwide. National Geographic's (2016) [12], BBC's (2018) [13], and the NY Times (2018) [14] are all recent media articles that espouse the story of water being a driver of conflict.To conclude, Strategic Foresight Group (2015) discovered "*a direct correlation between neighbourly relations and the level of water cooperation*" [15, p. 9]. Theseabove-stated argumentspresent a brief insight as to how water's relationship with society with the capacity to build peace or manufacture conflicts manifests.

The practice of water creating a shared challenge and presenting an opportunity for a shared solution is referred to as "environmental peacebuilding". Tobias Ide (2019) broadly defines environmental peacebuilding as referring "*to all forms of cooperation on environmental issues between distinct social groups, which aim at and/or achieve creating less violent and more peaceful relations between these groups*" [16]. The Peace Park in the Cordillera del Condor in Ecuador and Peru is an example of environmental peacebuilding [17]. The two nations have also established an Integrated Water Resource Management Binational Commission for the Zarumilla River to counteract increasing tensions for access to irrigation water because of agriculture expansion [15]. Cooperation between actors builds communication, trust, and increases shared benefits from a shared resource while reducing risk and suspicion [6], [16], [18]–[20]. These possible outcomes act as a form of preventative diplomacy and reduce the likelihood of conflict between actors. Environmental peacebuilding presents an avenue for building peace and political stability discourse in the water sector.

Environmental peacebuilding takes different forms throughout conflict and in the pre- or post-conflict periods. Table 1 illustrates the various strategies that peacebuilding activities can take throughout the phases of conflict [17, p. 12]. Activities targeting conflict prevention aim to stop conflict from developing between different parties. This is the earliest form of conflict resolution that seeks to address the grievances that accelerate conflict [21]. Crisis management follows conflict prevention upon the outbreak of a conflict. The management of a crisis attempts to control the processes of conflict to reduce the destruction and direct the conflict process to a more productive end [22]. The final phase is the post-conflict period characterized by peacebuilding efforts. After the cessation of conflict, peacebuilding efforts assist counties and populations to transition and recovery from the destruction caused by the conflict. Peacebuilding activities will often include elements that seek to prevent the re-emergence of conflict through various conflict resolution mechanisms [23]. Water security planning contextualized within the environmental peacebuilding framing carries potential towards addressing conflicts related to land, water and climate crisis in a more inclusive and equitable manner. Utilizing the various mechanism outlined in Table 1 is a way to capitalize on the peacebuilding potential of water.

Environmental Peacemaking Strategies by Conflict Phase		
Prevention	Crisis Management	Peacebuilding
• Information gathering; stakeholder mapping and analysis; • Community dialogues; establishing measures to build confidence and trust between groups with disagreements; and • Developing inclusive, transparent and accountable natural resource management systems and meaningful engagement opportunities for conflict parties to prevent escalation around contested issues.	• Improving communication and information sharing among stakeholders; • Encouraging collaborative processes based on joint fact finding, problem-solving, and shared responsibility in decision-making; and • Use of third-party mediators.	• Creation of joint decision-making spaces that promote the co-management of natural resources such as water, timber or minerals; • Transboundary conservation efforts that bring together a diverse group of stakeholders including policymakers, scientists and civil society; an • Development of sustainable economic opportunities through, for example, sustainable land use strategies, processing of raw materials to add value before export, and eco-tourism development

Table 1: Adapted with permission from B. Ajroud, N. Al-Zyoud, L. Cardona, J. Edmond, D. Pavitt, and A. Woomer, "Environmental Peacebuilding," Conservation International: Policy Center for Environment and Peace, Oct. 2017.

It should be noted that using water to build cooperation and overcome conflict between actors can also take detrimental forms. The emphasis on cooperation should not be interpreted as leaning towards cooperation being the end goal. Water is an instrument in promoting peace or conflict and so does cooperation have its positive and negative potentials. The asymmetries in riparian power surrounding a water source can engender harmful, exploitative, and coercive forms of cooperation over water sources [24]. The drivers of conflict and cooperation in

the water context can often, but not limited to, be attributed to the function of water resources, the interests of riparian actors, and the broader circumstances of population and environmental conditions [20], [25]. Accounting for the different forms of cooperation in building water security is paramount to prevent the entrenchment of harmful cooperative activities that undermine a holistic notion of water security.

The peacebuilding potential of water is not only theoretically possible but also empirically visible. Water as a catalyst in promoting peace and political stability continues to be an underexplored avenue with the misattribution of water scarcity as a sole primary driver in some conflicts. Water can serve to foster the normalization and reconciliation of relations during times of conflict. A prominent example of water cooperation is found in the Mekong Committee in the 1950-70s. The Committee continued its operations throughout the Vietnam war in gathering shared topographical and hydrological information on the Mekong river [26]. The resilience of joint water committees and cooperation between upstream and downstream riparian states is also noted for the Indus Water Treaty and the "Picnic Table talks". The Commission of the Indus Water Treaty of the 1960-70s served as a communicative platform between India and Pakistan during periods of armed hostility [26]. A series of secret water talks dubbed the "Picnic Table talks" took place between Israel and Jordan prior to the 1994 Peace Treaty [27]. The Picnic Table talks helped Israel and Jordan to manage the Jordan River starting in 1953 while the two nations were officially at war [9]. The peacebuilding capacity of water during armed hostility serves as a key point to explain water as an instrument for peace and political stability.

The role of water in peacebuilding extends past the period of war into the post-conflict reconstruction and development (PCRD) phase. Peacebuilding activities are crucial in meeting basic human needs and facilitating a peaceful transition into a period of political stability. Two examples to highlight the role of water in PCRD are visible in the post-India and Pakistan independence period and post-war period in Angola. An analysis by Zawahri (2011) on the economic reconstruction in eastern Punjab following the period of intense communal violence in the post-India and Pakistan independence period, reveals the revitalization of key hydrological infrastructure in facilitating the displacement and subsequent rehabilitation of millions of refugees. Zawahri notes that the Indian government's scheme to allocate land to refugees and displaced persons while securing irrigation water from canals and wells for food security was pivotal to ensuring post-conflict stability [19], [28]. This example represents water services provided by the state to individuals in a top-down approach during the PCRD period

Bottom-up practices in water governance have proven just as effective in PCRD situations. Community-based organizations foster greater inclusion, participation, and democratic devolution of power to reduce inequality. Andrea Beck explores this practice in Luanda, Angola. During the post-war period in 2002, water user committees were established at the grassroots level. These committees were tasked with "operating standposts, collecting revenues and overseeing operations and maintenance" which has led to greater community participation, responsibility, and accountability [29, p. 219]. Local management brings an array of benefits that can be compounded to meet the broader socio-economic needs of communities. Water is an underlying element connecting "economic integration, environmental conservation, and sustainable development" together [30, p. vii]. Water facilitation plays an important role in peacebuilding throughout PCRD periods and can be utilized in both top-down and bottom-up approaches.

The emerging nexus between water, peace, and political stability is being documented and decoded in the discourse of peace and conflict. The intersection of water in economic activities, human well-being, ecosystems, and water-related hazards renders water as a crucial element in peace and political stability for states and communities. Water can fuel grievances between stakeholders when it is inequitably distributed between sectors [31]. Peacebuilding with water between water's stakeholders is possible and advances water as an instrument of peace. In summary, understanding the relationship between water, peace, and political stability is vital for planning a water-secure future for states and communities.

Case Study 1: The domestic water conflict in Cochabamba, Bolivia

The domestic water conflict in Cochabamba is an example of an unsustainable approach to water management. Economic factors at the center of this approach proved to be unsustainable because water became unaffordable for a vast portion of the city's residents. Grievances between the residents and the city continued to increase and resulted in months of violence and civil disobedience. Cochabamba's water services were eventually returned to the municipal provider from the private holder. The World Bank and International Monetary Fund came to an agreement with the Bolivian government for a national debt relief program in the late 1999s to the early 2000s for $138 million USD [32]. Some state-run services were to be sold off and privatized as part of the debt relief

agreement. Cochabamba's municipal water supply was one of the services that were privatized and sold to Aguas del Tunari, a private international consortium [33].

Under the Municipal Water and Sewage Service of Cochabamba (SEMAPA), close to 50% of the city's residents had access to the SEMAPA water services [32]. Many of the remaining residents relied on water trucks, wells, and neighbors for their daily water needs. It was advocated that by privatizing the city's water supply would increase accessibility and bring a guaranteed return on investment of 15% [32], [34]. The initial forecasted price increase claimed that the poorer socio-economic classes would not experience more than a 30% increase in water pricing [35]. These arguments hope to provide a win-win incentive for privatizing the city's water service.

Soon after it was discovered that the poor were subject to an average 41% increase in the cost of water services while the majority of water users experienced a 51% increase after the city's water services were privatized [36]. These price increases were unaffordable and lead to months of violent civil disobedience. Hundreds of the city's residents were injured and at least six died during the waves of protest [33]. Cochabamba's water supply was eventually returned to SEMAPA after months of unrest, however, the reinstatement of SEMAPA did not address the issue of water scarcity and accessibility as proportionality fewer people had access to water than prior to privatization[37].

The privatization of Cochabamba's water and sewage services was lacking a holistic approach to water management that is vital for planning water security. The economic viability of the project is important but must also address the availability, accessibility, the affordability of water services for water users. These three aspects of drinking water relate to the condition of human well-being in the Water Security framework (UN Water, 2013). An equitable approach to water management that considers the well-being of water users is more likely to succeed than one that ignores such dimensions. In the Cochabamba case, ignoring the affordability of the water for the city's residents lead to the collapse of the privatized effort. The case study points to the importance of incorporating a holistic water security framework towards planning water-secure strategies, more so in settings where water crises and conflicts are common.

Case Study 2: The Case of the Jordan River Basin

The Israeli-Jordanian 1994 Peace Treaty and its Annex II pertaining to water-related issues is an example of water governance that served detrimental to the basin's ecology and to water-related grievances of marginalized stakeholders. Approximately 90-95% of the basin's water supply is being diverted for domestic, agricultural, hydro-power, and development projects between Syria, Israel, and Jordan proceeding the Peace Treaty [38], [39]. The river is being treated as an inexhaustible resource and is surpassing the basin's recharge rate. The International Institute for Sustainable Development predicts that the Jordan River will shrink by approximately 80% by the end of the 21st century [39]. The basin's actors are extracting unsustainable amounts of water from the basin. This overexploitation of the shared water source degraded the riparian ecosystem and livelihood and income generation opportunity for stakeholders depending on the river.

Israel is the dominant political actor in the Jordan Basin and the second annex of the Israeli-Jordanian peace treaty relating to water issues is "heavily skewed clause-by-clause" within Israel's favor [40, pp. 167–168]. Not only is there an imbalance between Israel and Jordan in the water-related annex of the peace treaty, but downstream in the lower Jordan Basin, the water distribution between the Israelis and Palestinians is highly coercive and inequitable. There exists a 90-10% water distribution between the Israelis and Palestinians [24]. This is further aggravated by the Israeli-Palestinian Joint Water committee's licensing scheme granting an effective veto for Israel in cases of water projects threatening the interests of the Israeli state [41], [42]. Negotiations in 2000 and 2008 failed to address the power asymmetry and imbalanced distribution of water between the Israelis and Palestinians [40]. The situation in the lower Jordan Basin is representative of a coercive form of cooperation. It has continued to marginalize a portion of the basin's inhabitants and is one factor increasing the water-related grievances between the Israelis and Palestinians that diminishes from the region's level of peace and political stability.

The role of state actors in water governance is central but does not exclude the importance of non-state actors. Community-based organizations and non-governmental organizations also play a relevant role in building positive forms of cooperation by using water as a peacebuilding instrument. A prominent example in the current case is the "Good Water Makes Good Neighbours" initiative by Friends of the Earth Middle East (FoEME). FoEME's objective is "the promotion of cooperative efforts to protect the shared environmental heritage of the region" [43]. This initiative establishes a bottom-up approach centered on addressing transboundary environmental issues between Israel, Jordan and the Palestinian territories. The second phase of the program has garnered 17

municipalities to conduct joint water and waste management projects between the Israelis, Jordanians and Palestinians [44], [45]. Grassroot activates such as FoEME education and awareness "knobbier's path tours" have exposed thousands of residents in the Jordan Valley to the degraded ecological state of the lower Jordan River [38]. The shared environmental challenges present an opportunity to build peaceful dialogue for collaborative solutions despite the broader hostile political context. For instance, the establishment of three "ecopeace parks" to date with the support of local citizens and municipalities involved with FoEME received state-level support from Israel [46].

Case Study 3: Conflict analysis of the Syrian Civil War

The Syrian civil war reflects on the argument that water can be misattributed as a direct driver of conflict. Three academic papers between 2012 and 2015 purported that climate change impacts on drought and water patters within Syria as a leading driver of the conflict [47]–[49]. The arguments outline how anthropogenic emissions viewed within climate change impacts increased the severity and length of a drought in the late 2000s. Furthermore, this drought caused large waves of migration from the primarily agriculture-based countryside into urban settlements. The increasing tension in urban centers is argued to play a part in food insecurity and growing unemployment that built up the political instability across the country [47, p. 338]. This case study points to the opinion that understanding the role of water in migration, food insecurity, and increasing political tensions cannot be represented in an overgeneralized thesis. The attribution of water in driving conflict contains numerous other elements.

None of the arguments that outline the role of water and drought in the Syrian Civil War claim that it was the sole cause, but the extent that climate change and drought can be identified play a role as a direct or indirect driver in the conflict is uncertain. Selby et al (2017) examine the drought-migration-civil war thesis to determine the extent that climate change caused the drought, the magnitude of the drought on migration, and the degree of drought-migration that feeds into sparking the conflict. Selby concludes that in all cases the data and consequences are "overstated and unreliable" [50, p. 238]. The study also reflects how socio-economic and socio-political realities in Syria prior to the civil war. And, how these realities in tandem with climate change (mostly droughts) operated in the civil conflict in Syria. Socio-economic grievances began with agriculture liberalization and privatization reforms in the 2000s that were intensified under Bashar al-Assad's accession. The eventual removal of key government fuel and fertilizer subsidies resulted in price hikes of 342% in 2008 and 200-450% in 2009, respectively [50]. The socio-political drivers during the first protests "denounced the security forces and the broader apparatus of authoritarianism" [50, p. 240]. Widespread civil unrest spread under the pretense of revolution against the broader repressive regime and the President's oppressive regime.

Disentangling the role of water-related elements in conflict is a difficult task. Collin Kelley's Climate modeling indicates that greenhouse emissions have doubled the likelihood of the drought in the Middle East, but even in the absence of climate change, it is not possible to say there would be no drought or no war [10]. The notion that the drought was a primary driver of conflict in Syria remains uncertain because of the same multi-year drought-impacted Cyprus and Jordan without any equivalent unrest. Lebanon was also impacted by a drought of similar extent and has provided refuge for 1.5 million refugees fleeing from Syria [51]. Lebanon has not experienced any similar level of unrest equivalent to the civil war in Syria. Moreover, various countries were engulfed in a period of political unrest sweeping the Middle East and North Africa in 2011. Unraveling how climate and water-related factors affect conflict is a difficult task that simplified theories cannot describe while excluding the social and political considerations on the ground.

Forwarding the Dialogue

The mutually reinforcing relationship between water, peace, and political stability is garnering greater awareness on a global scale but continues to be underemployed. Wider recognition of this emerging nexus is increasing the potential for water as an instrument in peacebuilding. The BPIand UN Water's WLC, particularly the Global Water Security Capacity Development Program (https://wlc.unu.edu/courses/course-v1:UNU-INWEH+INWEH-01+2019/about), are two platforms that have emerged to conceptualize and operationalize the water-peace-political stability nexus. These can assist stakeholders with the tools to enhance their knowledge and develop their capacity to addresswater-related issues within a framework of peace and political stability. Mainstreaming the evolving water-peace-political stability nexus continues to remain a challenge with an abundance of potential.

In terms of existing framings and tools that can serve useful to explain this nexus, indices such as the standard precipitation index, effective drought index, and the water scarcity index areplatforms operating in the water observatory practices. These indices are often underutilized in formulating effective water management practices and should be employed in what Geneva Water Hub calls "predictive performance models" to attenuate the overexploitation of freshwater resources [6, p. 45]. The water security index estimates 1.4 billion people now live in river basins where water tables are either at or exceeding their minimum sustainable recharge rates [52]. The exhaustion of groundwater occurs when the level of water extraction surpasses the water table's recharge rate. Some of the largest groundwater sources in India, China, and the United States are all being exploited beyond their capacity to be replenished [53]. The overexploitation of groundwater has devasting impacts on the sustainability of social and ecological systems. Diminishing levels of available freshwater can lead to further competition. Evaluating existing policies and mechanisms with the water-peace-political stability nexus can assist in planning a more water-secure future.

The incorporation of water-related elements in peacebuilding strategies is currently underemployed. A study conducted by Andrea Beck (2015) examined 568 documents availed by the UN Peace Building Commission from 2006 to 2014 and discovered that only 12.5%, or 71 documents, referred to water-related issues [29]. This exposes a gap in the level of recognition and implementation of water as an environmental peacebuilding instrument. Further research conducted revealed that in post-conflict countries—Nepal, Rwanda, and South Sudan—citizens described their demands for water and sanitation services from governments as correlating to their perception of the state's legitimacy [54]. The potential to use water as a peacebuilding instrument remains with an abundance of untapped potential.

The knowledge base surrounding water and peace continues to expand with the rise of publications and practical capacity development despite its current underutilization. The UN Special Rapporteur on the human right to water and sanitation, C. De Albuquerque (2012), published *On the Right Track: Good practices in realising the rights to water and sanitation*. Geneva Water Hub's (2017) *A Matter of Survival*, Swiss Agency for Development and Cooperation's (2017) *Water as an Asset for Peace*, Strategic Foresight Group's *The Blue Peace Framework*, UN Water's (2019) *World Water Development Report*, and Adelphi's (2016) *Water and Climate Diplomacy Report* are all examples of water literature making progressing on a global stage. The Global Water Partnership brings together over 3,000 organizations from 179 countries in facilitating on-the-ground knowledge and capacity development [55]. These initiatives represent the stakeholder collaboration needed to successfully advocate and implement sustainable water management for advancing water's relationship to peace and political stability.

The peace and political stability stream of knowledge enhancement and capacity development surrounding water security is another aspect that needs attention and scaling at the local/national level. Water's capacity as a "threat multiplier" is increasingly talked about in military circles and on a global scale. Former UN Secretary-General Kofi Annan remarked that changing hydrological patterns will destabilize already "fragile states or volatile regions" in fostering resource competition and increasing migration [56, p. 15]. The U.S. Department of Defense risk assessment (2010)noted that climate change and the resulting impacts on water scarcity "*will increase the spread of disease, and may spur or exacerbate mass migration*" with geopolitical consequences [47, p. 337]. Incorporating these perspectives into the water discourse is essential in formulatingfuture plans and actions within a water security framework. However, the misappropriation of water's role in conflict is still distorted in the media and is rather unclear in academia.

Enabling policy planners and conflict analysts with the knowledge to untangle the components in water-related issues is a challenge given the various interlinkages. UNU-INWEH with support from partners and experts has developed an online Global Water Security program. This course unpacks the enhanced understanding of UN Water's (2013) water security definition [57]. The program aims to decode each of the four "hard elements" (see Fig.1 circled red) and the four "enablers" (see Fig. 1 circled blue) in eight separate modules [3]. The breakdown of the hard elements and enablers provides clarity on the interlinkages between these eight factors. The hard elements are described as the four inner factors that define water security, and the surrounding enablers are factors to (de)stabilize the fulfillment of the four inner factors in Fig.1. The farming is adaptable to fit a local context. Policymakers can begin with any combination of enablers and hard elements and later incorporate the various other aspects. The UN Water's WLC houses the Global Water Security e-course as part of its inventory of online learning resources "for the development and implementation of sustainable natural resource management strategies" [58]. The adoption of these frameworks into a deliverable format for knowledge enhancement between researchers, policymakers, and analysts is a critical step to achieve a water-secure reality. Also, UN Water's water security

framing to comment on the stated nexus provides a good base to understand the interlinkages between water, peace, and conflict.

The Blue Peace Index

The inclusion of indices is central for analyzing data and generating broader pictures of transboundary and domestic water security. However, different indices have different limitations and benefits. The standard precipitation index, effective drought index, and the water scarcity index are all indices using environmental indicators and "hard science" quantitative data sets. The exclusion of various "soft science" considerations when using these indices to understand the water security of a region is hence limited. Capturing a complete picture of a region's water security must include the aspects in human societies that affect water security. Different regions experiencing water stress will respond differently to periods of water scarcity based on the various factors of governance. Institutions, conflict resolutions mechanisms, and early warned and action systems are some methods that can help alleviate and assist a population to adapt to the impacts of water stress. The BPI is one example of a unified index including both the hard and soft science qualities.

The BPI is developed by The Economist Intelligence Unit with support from the Swiss Agency for Development and Cooperation and was launched in 2019. The BPI assesses water management based on five aspects (Fig.4) of water security and has evaluated 24 countries from 5 basins so far [59]. The BPI examines five aspects that are disaggregated into multiple sub-sections on both a country and basin level analysis [60]. The accumulated data provides a more thorough understanding of water security while also evaluating the basin actors' resilience and capacity to adapt. The BPI's incorporation of the relevant socio-political factors on a local, national and basin level to indicate a level of water-related peace and stability is an asset for policymakers. The proper institutional and water management practices can mitigate and prevent the effects of water stress and encourage sustainable development for both humans and the environment. integrating the BPI and other similar indices provides a greater interpretation of water security and the shared challenges of human pressures on the environment.

Capturing the interlinkages between water sectors is a challenge yet important to incorporate in analyses. The BPI adopted a case study approach that examines the interlinkages within the water-food-energy-ecosystem nexus. This nexus is employed in the Sava River Basin between Bosnia and Herzegovina, Croatia, Montenegro, Serbia, Slovenia, and Albania in the Western Balkans in the creation of the 2002 Framework Agreement on the Sava River Basin. The Water Convention Secretariat utilized the Transboundary Basin Nexus Assessment (TBNA) to evaluate the "positive and negative linkages, benefits and trade-offs between different sectors, as well as the potential impact of climatic and socioeconomic changes on the basin's resources" [61]. The UN Economic Commission for Europe assigned a task force to further develop the TBNA approach to enhance the framework's analyses of existing challenges, synergies, and potential opportunities in other basins [62]. The work assesses "nexus solutions" within the interplay of sector-related challenges to produce multi-sectoral win-win outcomes [63, p. 61]. Nexus frameworks are vital for examining the interlinkages between water sectors in planning for water security.

Conclusions

Uncovering water's peacebuilding potential requires a continued exploration of the emergent water-peace-political stability nexus and how the various forms of cooperation and conflict interact with this nexus. This synthesis reviews the nexus and argues that UN Water's framing of water security is a fitting framework for understanding and assessing the dimensions to explain the stated nexus. UN Water's water security framework offers a beginning point to decode this emerging nexus and comments on how the interlinkages manifest in this nexus can be better addressed in planning for water-secure futures. These interlinkagesreflect a mixed narrative of water's role in peace and conflict.

Peace as a strategy for planning water-secure futures is used in preventative practices, in crisis management, and foraddressing post-conflict reconstruction and development. Water cooperation in instances of conflict, such as the Picnic Talks, Indus Water Treaty, and the Mekong Committee, represents how water can serve as a vehicle for promoting peace efforts and cooperation mechanisms. The study argues that accusing water as the cause of conflict is an oversimplification of how water affects conflict, the conflict's drivers, or the stakeholders' water-related grievances. It reiterates thatinefficiencies in water governance are often the source of conflict that relates to a water crisis and untangling how water, peace, and conflict correlate exposes the peacebuilding potential
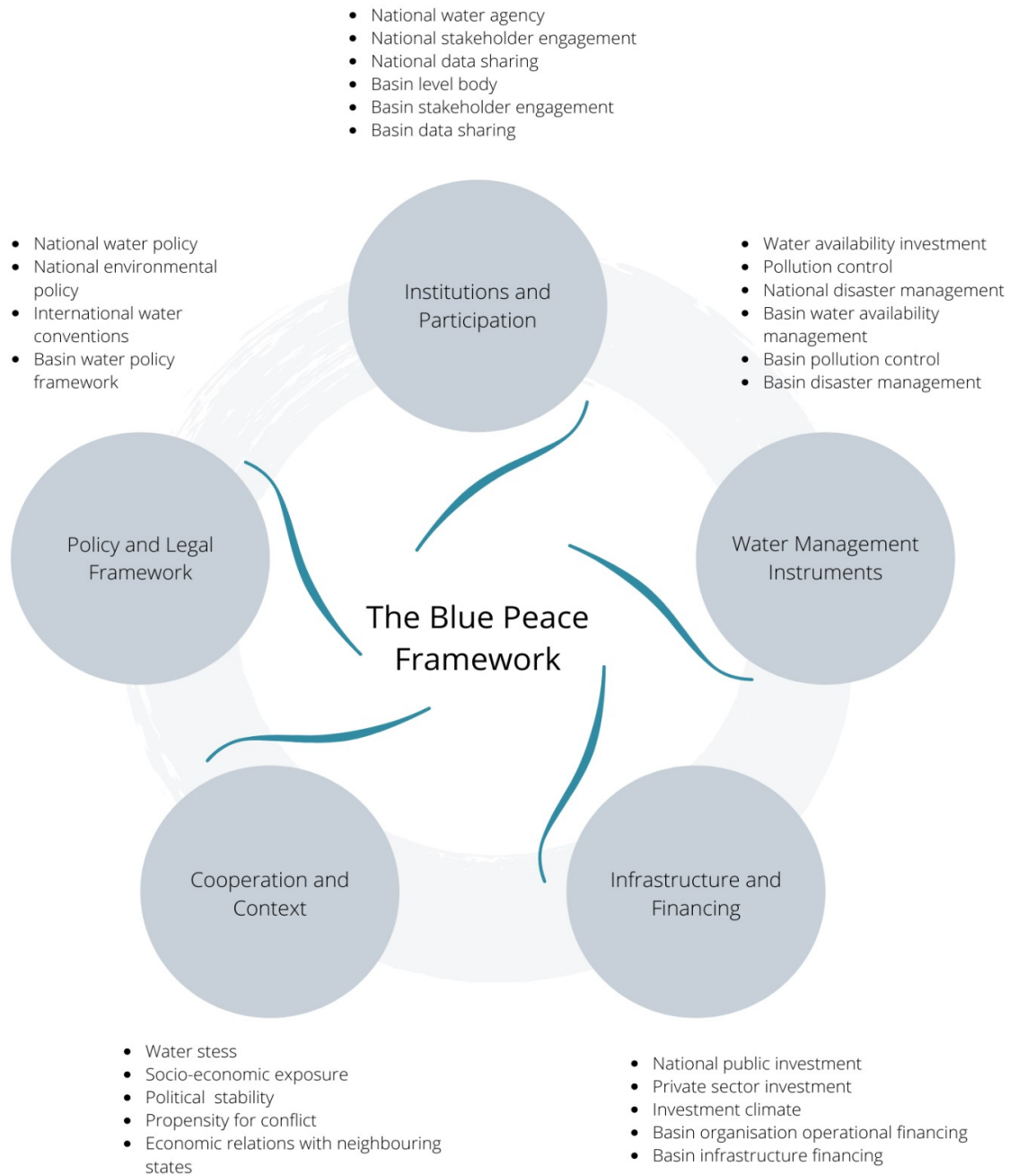
- National water agency
- National stakeholder engagement
- National data sharing
- Basin level body
- Basin stakeholder engagement
- Basin data sharing

- National water policy
- National environmental policy
- International water conventions
- Basin water policy framework

- Water availability investment
- Pollution control
- National disaster management
- Basin water availability management
- Basin pollution control
- Basin disaster management

Institutions and Participation

Policy and Legal Framework

The Blue Peace Framework

Water Management Instruments

Cooperation and Context

Infrastructure and Financing

- Water stess
- Socio-economic exposure
- Political stability
- Propensity for conflict
- Economic relations with neighbouring states

- National public investment
- Private sector investment
- Investment climate
- Basin organisation operational financing
- Basin infrastructure financing

Figure 4: Adapted from The Economist Intelligence Unit, "Blue Peace Index 2019 Report," 2019.

for water. In this context, Case Study 2 emphasises how exploitative and coercive forms of cooperation marginalize basin actors and detract from the level of peace and political stability. Power asymmetry between basin actors can result in an improved outcome for the dominating actor and a disempowered position for weaker actors. Case Study 2 further illustrates that non-state actors play an important role in peacebuilding between basin stakeholders acting in tandem with state-level activities to manage shared water systems. Peacebuilding with water for planning water-security has potential throughout conflict and in the pre- and post-conflict phases.

Using existing tools and mechanisms to examine the interlinkages in the water-peace-political stability nexus can better support the operationalisation of the water security framework, knowledge dissemination and capacity development for policymakers, conflict analysts, researchers, and other relevant parties for water security planning. Initiatives adopted by the Global Water Partnership, FoEME, and UNU-INWEH are promising platforms for transferring knowledge towards creating a "community of practice". This synthesis also highlights the relevance of the BPI as it incorporates the socio-political factors that impact water security. Authors argue that experts and institutions making conscious efforts to integrate peace and political stability into water management are key examples to promote inclusive and integrated water security planning and related policy measures. Overall, analyzing the relationship between water and the socio-political factors affecting water security is vital to understand how it interacts with aspects of peace and political security. Case Study 3 reflects on the argument of how water can be misattributed as a direct driver of conflict. In conclusion, water security framing must incorporate an intersectional assessment of diverse aspects and challenges for planning water-secure futures for states and communities.

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