


International Water Comprehensive Organization (IWCO): Creating alliances for improved water management and solving water conflicts

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ABSTRACT

International organizations constitute the basis to increase water co-operation, prevent or reduce the possibility of conflicts between countries, and, were they to occur, achieve co-operation to resolve them. The proliferation of water-related conflicts, especially involving transboundary watersheds, the need for stakeholder co-operation, and the necessity of creating alliances between water organizations call for the formation of an organization to tackle the resolution of such conflicts. River Basin Organizations (RBOs) have been created in the water field in recent years, which have addressed a variety of water-related problems. Yet, there is no holistic agency at present tasked with the comprehensive review and resolution of water conflicts worldwide. This paper presents a plan to create an International Water Comprehensive Organization (IWCO) under the auspices of the United Nations that would address water conflicts worldwide, which would integrate other existing organizations with jurisdiction in the realm of water management. Furthermore, this work describes the objectives and needs for creating the IWCO, defines its structure, and outlines its main tasks and authorities. The IWCO would integrate existing water-related organizations for solving hydropolitical issues, and would provide logistic support leading to scientific and legal advances in the water field.

Key words: hydropolitic, international organization, water law, water policy

HIGHLIGHTS

- Outlining for International Water Comprehensive Organization (IWCO) under the auspices of the UN.
- Identifying the need for the IWCO and its objectives, structure, tasks, and authority.
- Integrating existing organizations with jurisdiction in the realm of water management.
- Monitoring the hydropolitics, water law, water policy, and water economy at the global level.
- Creating alliances for water management and solving conflicts.

1. INTRODUCTION

Throughout human history, there have been many wars and conflicts to control natural resources, especially water (Khan & Awan 2020). Numerous recent studies have been reported concerning water conflicts. Aggestam & Sundell (2016) analyzed the nexus of technocracy–peacebuilding and its implications on water conflicts and hydropolitics by examining synergies between water management, development, and peacebuilding that promote technical and functional solutions. De Jong (2019) reported a study on the Israel–Palestinian conflicts about water accessibility and presented an architectural design for a Temple of Water as a catalyst for dialogue and understanding between Israelis and Palestinians in the water-stressed region of Hebron in the southern West Bank. Al-Muqdad (2019) examined the water conflict in the Euphrates–Tigris Basin and evaluated its political impacts by creating a conceptual model for the hydropolitical cycle, addressing the importance of negotiation as an instrument to reach to an agreement. Zeitoun *et al.* (2019) examined and proposed an analytical method designed to support efforts to transform inequitable and unsustainable transboundary water arrangements. Tayia (2019) examined conflict resolution mechanisms involving transboundary water resources. Rubio-Velázquez *et al.* (2023)

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reported the historical development in the Lower Colorado River region in northwestern Mexico and the southwestern United States. River-water diversions made to support such development have dried up the once navigable Lower Colorado River in its estuary bordering the Sea of Cortez (Gulf of California) and inflicted ecological degradation there. Furthermore, groundwater pumping exacerbated by population growth and transnational agricultural businesses has caused an overdraft of the binational (Mexico–USA) aquifer underlying the Lower Colorado River region causing multiple adverse social and environmental impacts in spite of the existence of an International Boundary and Water Commission (IBWC).

A key issue in water conflicts concerns the hydropolitics debate. Hydropolitics is emerging as a discipline concerned with studying and seeking solutions to water management issues comprehensively and specifically considering the political dimensions of water management. Hydropolitics deals with conflict and co-operation, commonly, but not exclusively, involving states as the main actors in cases concerning shared international river basins (Turton & Henwood 2002). Hussein (2017) examined the Jordanian and Syrian hydropolitics with a focus on the reduced flow of the Yarmouk River. The latter authors examined bilateral agreements, the hydropolitical discourses they generate, and the competing solutions they facilitate. Rogers & Miller (2017) reviewed hydropolitical frameworks and their application in China. They outlined the key hydropolitical framework, tracing the relations between power, water, society, and technology. Hussein (2018) reported a hydropolitical analysis of transboundary groundwater governance, and made empirical contributions to the study of transboundary groundwater co-operation. Allouche (2019) presented a study of India and Israel examining the hydraulic imaginaries, state power, identity politics, and infrastructural transformations linked to post-colonial hydropolitics and the associated violence that has surrounded the Jordan River and Indus River disputes. The latter study shows the sense of national appropriation of water is intensified due to the state-building and nation-making processes. Aljefri *et al.* (2019) examined the hydropolitical conflicts involving the Eastern Nile countries over the Grand Ethiopian Renaissance Dam at three different times. Their findings denote that the geopolitical and economic changes in Egypt, Sudan, and Ethiopia allowed Ethiopia to construct the dam without confrontation with Egypt and Sudan. Moore (2018) evaluated China's domestic hydropolitics and examined the dynamics of conflict and co-operation between sub-national administrative jurisdictions in China. The latter study argued that domestic hydropolitics can rival the international variety in complexity and contentiousness.

However, water conflict concerns are not limited to the hydropolitics debate. In recent years, different aspects of water science have been defined and developed to help communities to resolve water conflict concerns. Wostl (2019) recognized several modes of governance found in bureaucratic hierarchies, networks, and markets. The latter work highlights the importance of hybrid governance systems with synergistic interplay for dealing with complex water management challenges. Rai *et al.* (2017) reported a study of more-than-a-century-old hydro-diplomacy between India and Nepal, which has passed through tumultuous political water relations that been shaped and reshaped over time. Their study shows that the co-operative events outnumbered conflictive events. Kibaroglu (2019) reviewed Turkey's water policy and management, describing the principal water legislation in Turkey, identifying the main water institutions, and lending specific attention to the reorganization of various key ministries. Brethaut & Pflieger (2020) evaluated the types of transboundary water governance regimes. They offered an analytical tool for exploring the governance of transboundary rivers by presenting three governance regimes. Krakow (2020) analyzed international law regarding the human right to water, and examined the political factors that limit access to water, in particular by vulnerable groups.

Given the history of past contracts, conventions, treaties, and the like, there are various examples that demonstrate the importance and the necessity of an international water co-operation organization. The Afghan-Iranian Helmand River-Water Treaty (1973) is one of these examples. The treaty established the rights of Iran and Afghanistan regarding the Helmand River and its most important section is Iran's right to the river's water. Despite the clear content of the treaty it is nowadays not followed by the signatory countries. Political changes, regional climate change, and human demand for water cause this neglect. The treaty has become a source of contention rather than a solution, in fact exacerbating conflict in the region. The existing treaty considers a specific aspect of the river-water allocation but does not address all the intervening issues comprehensively. This type of situation is exemplary of situations when the IWCO could achieve co-operation among conflicting parties in the search for beneficial solutions.

Besides previous publications on water conflict resolutions (Akbari-Alashti *et al.* 2014; Beygi *et al.* 2014; Bozorg-Haddad & Mariño 2007, 2011; Bozorg-Haddad *et al.* 2009a, 2009b, 2010a, 2010b, 2013, 2015, 2016, 2017; Fallah-Mehdipour *et al.* 2011, 2013a, 2013b; Karimi-Hosseini *et al.* 2011; Soltanjalili *et al.* 2011; Sabbaghpour *et al.* 2012; Orouji *et al.* 2014), this study presents an outline for an International Water Comprehensive Organization (IWCO) that would monitor the

hydropolitics, water co-operation, water law, water policy, and water economy at the global level. Creating co-operation between countries, striving for impartiality, and respecting cultures are some of the challenges that are discussed in the following. The scarcity of freshwater resources causes conflicts between countries which constrains growth and development (Zolghadr-Asli *et al.* 2017a, 2017b). The structure of the world polity matters because nation-states actively involved in international organizations may have enhanced influence (Beckfield 2003). Therefore, the creation of an international organization as herein proposed to address water issues and create an integrated system for monitoring all aspects of water issues internationally is a timely endeavor. Furthermore, previous studies on water conflicts demonstrate that there are a good many problems in the world, which necessitate prompt, objective, fair and just adjudication. There are several institutions that work on water-related subjects; yet, unity and co-operation between these institutions is the missing link. The multifaced nature of water problems calls for multipronged monitoring and assessment. This work defines an organization that solves the cited deficiencies. To do so, first, the mandated statement for an IWCO is presented. This is followed by a statement of the organization's objectives, the interaction of IWCO with other organizations, and its structure, tasks, and authority are discussed in detail. Finally, a conclusion is drawn. Figure 1 depicts these steps. Figure 2 depicts the steps followed in the conceptual creation of an IWCO.

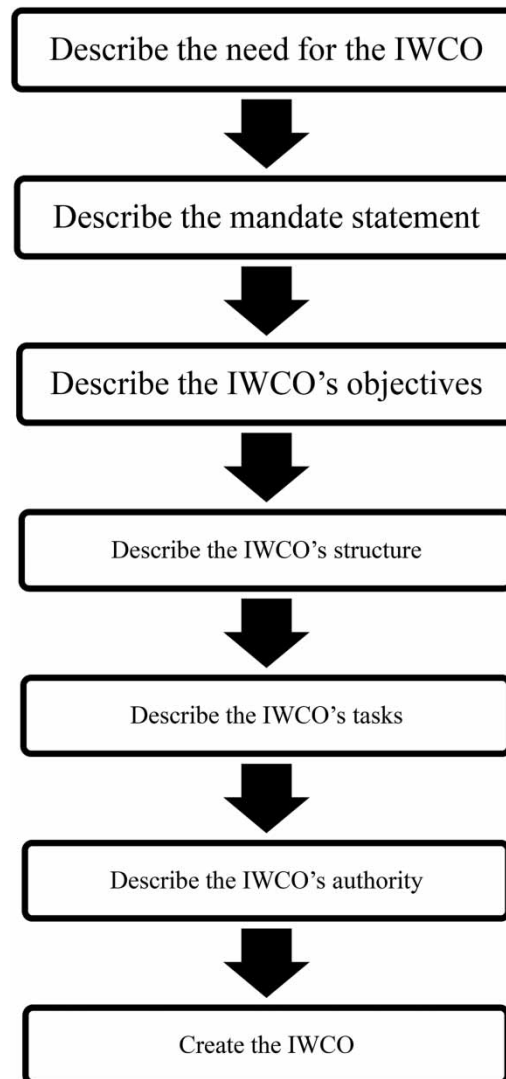


Figure 1 | The steps of this paper's methodology for creating an IWCO.

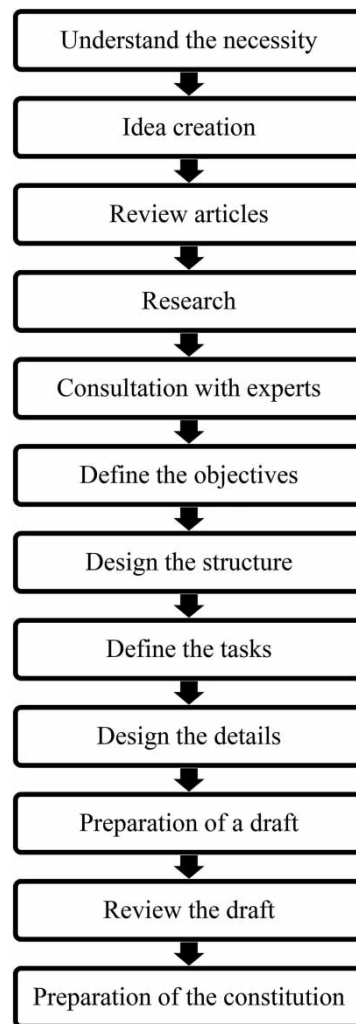


Figure 2 | Steps leading to the conceptual creation of the IWCO.

2. MANDATE STATEMENT

The IWCO would be an organization under the auspices of the United Nations (UN) devoted to water management. It would be dedicated to solving water-related problems involving surface water and groundwater by interacting with a network of water-focused organizations. The geographic scope of this organization would be worldwide, involving governments, non-governmental organizations, transboundary water, water management and community organizations that have a connection with water directly or indirectly. What distinguishes this organization from others is its focus on water activities. The enforcement mechanism of the IWCO would be based on independent judgments and co-operation with legislative institutions to enforce its legal instruments. The IWCO could resort to recommendations in situations involving minor disputes, or it could rely on stricter legal instruments such as agreements or treaties with executive powers in conflictive situations. Such an organization would bring about positive results such as creating a united network between water-related organizations, reaching harmony between countries involved in water conflicts, development of water co-operation, the enactment of water laws, economic, cultural, social, environmental, and scientific prosperity, achieving sustainable development goals (SDGs), and encourage the protection of vulnerable communities.

3. CHALLENGE

There are multiple challenges in implementing an IWCO. These challenges are (i) creating enthusiasm and attracting countries to participate, (ii) creating a reputation of impartiality with decision-making free of conflicts of interest, (iii) securing

funding, (iv) creating unity, co-operation, and forming alliances between international organizations involved with the topic of international law, security, and economic development, and the establishment of authority necessary to implement its mission. The next sections address how this study proposes to resolve the cited challenges.

4. OBJECTIVES

The IWCOs objectives are both short and long term. The short-term objectives are (i) monitoring political water conflicts, (ii) promoting water and environmental health, (iii) promoting scientific and cultural progress in the field of water, (iv) promoting water co-operation inter and intra-state, (v) integration of laws and organizations in the field of water, (vi) promoting gender equality, and (vii) encouraging collaboration with other organizations to achieve SDGs. Seven long-term objectives are herein identified for the IWCO to be achieved within a specified period of time by agreement between its member states. The objectives are (i) eliminating pollution of the seas and oceans, (ii) providing safe freshwater worldwide, (iii) determination of the status of all the boundary and transboundary waters, (iv) ensuring environmental water requirements in streams are met worldwide, (v) providing conditions for the prevention and treatment of water-related diseases such as cholera, (vi) abolishing the use of water as leverage in military conflicts, and (vii) increasing the knowledge of farmers to achieve sustainable and resilient agriculture. These goals directly or indirectly are aligned with the SDGs, and the IWCO would strive to achieve these goals. The first goal (eliminating pollution of the seas and oceans) contributes to SDG14 (Life Below Water). The second goal of the IWCO (providing safe freshwater worldwide) is aligned with SDG6 (Clean Water and Sanitation). The third (determination of the status of all the boundary and transboundary waters) and sixth (abolishing the use of water as leverage in military conflicts) goals of the IWCO are aligned with SDG16 (Peace and Justice Strong Institutions). The fourth (ensuring environmental water requirements in streams are met worldwide), fifth (providing conditions for the prevention and treatment of water-related diseases such as cholera), and seventh (increasing the knowledge of local farmers to provide sustainable and resilient agriculture) goals of the IWCO, respectively, fulfill the SDG15 (Life on Land), SDG13 (Good Health and Well-being), and SDG12 (Responsible Consumption and Production). The IWCO would have an essential role in supporting vulnerable communities.

5. INTERACTION WITH OTHER ORGANIZATIONS

The IWCO would interact with existing organizations to achieve its long-term and short-term objectives. There are several organizations in the field of water and related fields that perform their duties within their scope. The purpose of creating the IWCO is not to substitute existing organizations, but, rather, co-operating with them while assigning the IWCO a leading role in the water field. Among the agencies, the IWCO would co-operate closely with the United Nations Environmental Program (UNEP) in the water–environment domain. The IWCO would co-operate with the Intergovernmental Panel on Climate Change (IPCC) in the study of climate change impacts on water resources and developing strategies for adaptation and mitigation. The IWCO would collaborate with the Food and Agricultural Organization (FAO) and apply its expertise to achieve water and food security. The IWCO would perform as an international court for resolving disputes between countries related to water conflicts and improving co-operation. This would be achieved by working closely with the International Court of Justice in water-related matters. The IWCO would collaborate and devise joint action with other organizations to avoid redundancy and misuse of resources. For example, the IWCO would benefit from the World Health Organization (WHO)'s expertise in improving safe water supply and sanitation worldwide. Co-operation with the World Meteorological Organization (WMO) would improve the IWCO's capacity to address issues related to flooding and drought in meeting its objectives. The IWCO would engage professional organizations such as the American Society of Civil Engineers (ASCE), the Association of International Hydrogeologists (AIH), the Stockholm International Water Institute (SIWI), and others, which provide services and expertise in a wide range of water-related topics. The IWCO, however, would be the lead agency for water-conflict resolution, with other organizations assisting it as needed. Therefore, The role of all water-related organizations (whether private organizations such as ASCE or non-private organizations like the FAO) would be to assist the IWCO in achieving its goals timely.

6. STRUCTURE

A multi-level organization structure is an efficient choice for the structure of the IWCO due to the flexibility created by the opportunities of the overall mandate and the functional objectives of the organization to grow over time (Yaari *et al.* 2015). Its

advisory functions, implementing and maintaining basin activities, and sometimes wide mandates, in achieving its goals, and performing its tasks, make this structure possible. The proposed IWCO would have 11 main divisions, each of them operating independently to achieve their tasks while interfacing with the other divisions to avoid duplicitous, redundant, or conflictive functions within the IWCO. Each division would have a general manager responsible for its operation and maintaining good standing. Figure 3 depicts the proposed structure of the IWCO, where it is seen its 11 divisions are under the supervision of a board of directors. The divisions' tasks are defined next.

6.1. Board of directors

The management and administration of the IWCO would be exercised by its Board of Directors, which would consist of five members who are elected from among candidates for a four-year term by the representatives of the Member States. A four-year term would prevent the formation of cliques and elites, would allow officials to showcase their talents and abilities, and would promote efficient rotation of management. The IWCO's policies would be adopted by a majority vote of the five-member board. A large number of members of the board would be an obstacle to efficient management, and a smaller number would dissuade representativeness. The board's tasks would be managing the IWCO, policy-making, preparing long-term plans for the IWCO, coordinating and communicating management decisions to other organizations, deciding about forming new divisions or reforming existing ones, selecting the manager of each of the IWCO's divisions, and making budgetary allocations to the divisions. Broad powers are bestowed on the Board of Directors; yet, checks and balances of its decision-making would be provided by a group of countries chosen democratically among the member countries that would act as a parliament that monitors the decisions made by the Board of Directors. Therefore, policy decision-making would be the purview of the Board of Directors, while the confirmation of these decisions is conferred upon the parliament.

6.2. Executive board

The task of the Executive Board would be establishing general and detailed policies and objectives within the organization, such as setting employees' work policies and adopting internal bylaws, selecting the members of various committees required

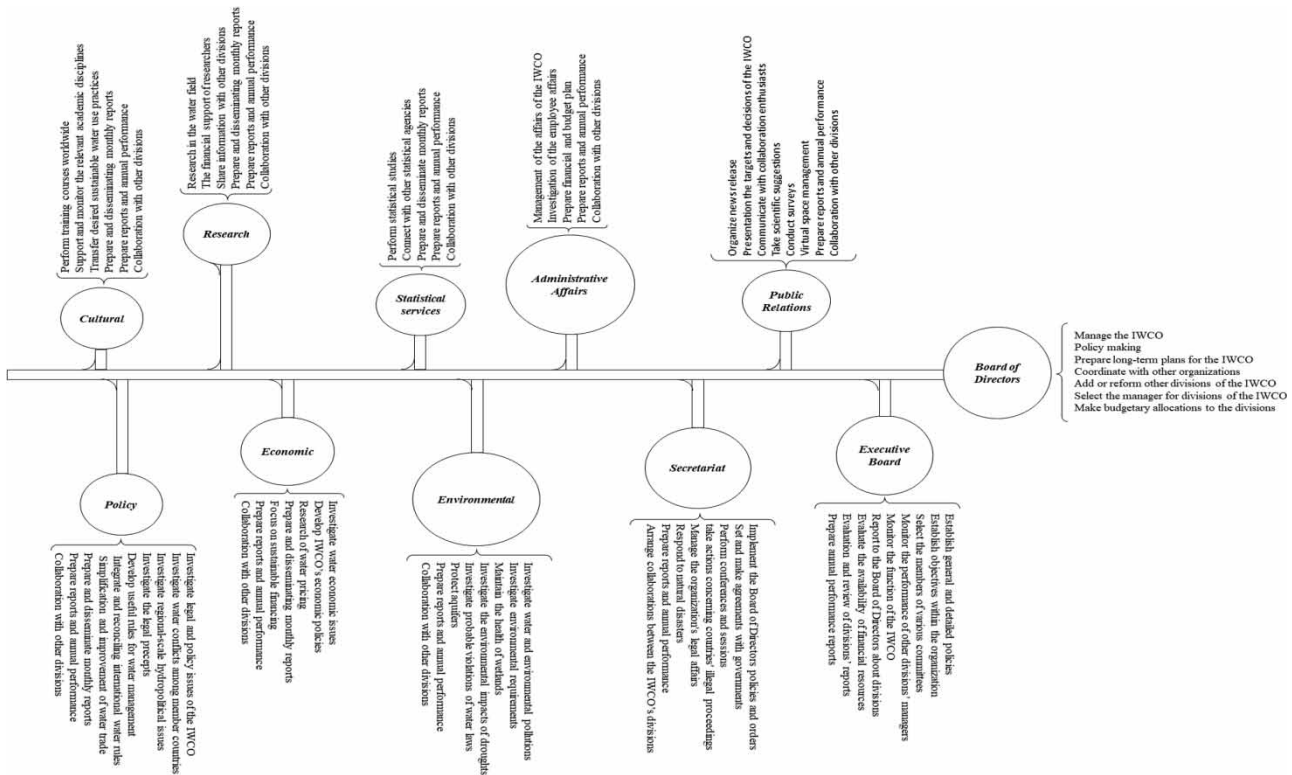


Figure 3 | Chart of the IWCO's structure.

to achieve the IWCO's goals, monitoring the performance of the managers of the divisions, monitoring the function of the IWCO according to preset objectives, and reporting to the Board of Directors about the performance, evaluating the availability of financial resources, evaluation and review of divisions' reports, and preparing annual performance reports to the board of directors.

6.3. Secretariat

The task of the Secretariat would be implementing the Board of Directors policies and orders, setting and making agreements with governments, organizing conferences and sessions, issuing warnings and taking actions concerning countries' illegal actions, managing the organization's legal affairs and the IWCO's contracts, responding to natural disasters in collaboration with emergency-response organizations, preparing monthly progress reports, preparing annual performance reports to the executive board, and arranging collaborations between the IWCO's divisions to meet the organization's targets. This division would interact with member states and other organizations. It could use online platforms for developing a network of connections. Also, its activities on the IWCO's web page could play an important role in sharing information and networking. Networking would facilitate negotiations and communication between the representatives of the member states, other organizations, and the Secretariat.

6.4. Administrative affairs

This division's tasks would be managing the administrative affairs of the IWCO, administering employee affairs, preparing financial and budgeting plans, monthly reporting, preparing annual performance reports for the executive board, and collaborating with other divisions to achieve the IWCO's targets.

6.5. Public relations

The tasks of the Public Relations would be issuing news releases, disseminating the targets and decisions of the IWCO, recruiting supporting constituencies, communicating with members and collaborators, receiving and responding to suggestions about the IWCO, conducting surveys and evaluating the IWCO's performance, virtual space management, preparing monthly new releases, preparing annual performance reports for the executive board, and collaborating with other divisions to achieve the IWCO's targets.

6.6. Statistical services

Providing accurate and timely statistical analyses to other divisions is key for their effective performance. For this reason, a separate division would be dedicated to statistical analysis and the adoption of information technologies. This division could co-operate with the Wilson Center, which tackles global issues through independent research and open dialogue. The National Agricultural Statistics Service (NASS) is a statistical center whose goal and activities could play a supportive role in contributing to this division's information base. NASS performs statistical activities in the agricultural, economic, demographic, and environmental areas, which could improve this division's efficiency. The tasks of the Statistical Services division would be performing statistical studies, networking with other statistical agencies, preparing and disseminating monthly reports, preparing annual performance reports for the executive board, and collaborating with other divisions to achieve the IWCO's targets.

6.7. Research

Research and scientific development in the water field would be two key functions of the IWCO. This division would conduct research in the water field. This division would support researchers through financial support, using this research to augment information shared with other divisions, and providing better approaches to their operations. Researchers would conduct studies concerning water problems that instill social upheaval. For example, Iran and Lebanon face water shortages and managerial problems that underlie social unrest. This type of research would enable this division to gain an understanding of countries' conditions and enable it to provide useful recommendations for coping with chronic calamities related to water problems. This division would provide training courses and share information helpful to address specific situations. Another benefit of IWCO research would be to improve its disaster-response capabilities. The research division would prepare and disseminate monthly reports, and annual performance reports for the executive board, and support other divisions to achieve the IWCO's targets.

6.8. Cultural

One of the IWCOs' tasks would be improving water use through governmental policy and local stakeholders' actions. The tasks of this division would be conducting training courses worldwide and disseminating knowledge about water use practices through social media, advertising, and news releases. This division would foster conditions encouraging improved knowledge about water matters by means of water museums and local interpretative centers (UNESCO 2021). Preparing annual performance reports for the executive board, and collaborating with other divisions to achieve the IWCO's targets are other tasks of this division.

6.9. Policy

The tasks of this division would be investigating legal and policy issues managed by the IWCO, investigating water conflicts among member countries, investigating regional-scale hydropolitical issues, investigating the legal precepts of international relevance and applicability, developing useful rules for water management, integrating and reconciling international water rules, simplification and improvement of water trade (in the form of virtual water transfers), preparing and disseminating monthly reports, preparing annual performance reports for the executive board, and collaborating with other divisions to achieve the IWCO's targets. This division would call countries' representatives who are involved in water conflicts, and by creating a Dispute Resolution Council to resolve conflicts. Assigning professionals to implement policies, using statistical and research information, making decisions and presenting plans to address specific issues would be among the duties of this division. History has shown that bias and undue interference by some countries have produced poor resolutions concerning water disputes, such as that involving water-sharing between Afghanistan and Iran. The objectivity of this division would be ensured by the political independence of the IWCO. In instances when one of the countries in the conflict is not a member of the IWCO this division would support the member country and defend its rights before by referring to and pursuing the conflict with the International Court of Justice. The IWCO would involve the co-operation of legal institutions in order to implement and process legal instruments. ICL, IIL, and ILA are institutions that could play helpful roles in supporting the IWCO's goals due to their experience with international laws.

6.10. Economic

The tasks of this division would be investigating water economic issues of international significance, developing IWCO's economic policies, researching water pricing, preparing, and disseminating monthly reports, focusing on sustainable financing of water infrastructures and the provision of water services, preparing annual performance reports for the executive board, and collaborating with other divisions to achieve the IWCO's targets. This division could have a role in the agriculture area by promoting the sharing of farming land among countries, sharing of hydropower across large regions, and promoting investment in water-related tourist centers, aquaculture projects, and in navigation endeavors.

6.11. Environmental

This division would study climate change phenomena as it impacts the world's water resources and evaluate water quality issues and the interactions between water and the environment. The tasks of this division would be investigating water pollution, investigating environmental requirements (in streams) and actions to achieve the requirements, maintaining the health of wetlands, investigating the environmental impacts of droughts, investigating probable violations of water laws, and protecting aquifers. Other issues in which this division would play a role are water quantity and allocation problems, water quality and pollution problems, drought management, hydropower and dam construction problems, fisheries protection, infrastructure and economic developments affected by water, control of invasive species and biodiversity protection in the context of water management, flood control, navigation and transport-related problems, which are among the most common issues found in the management of transboundary water (Wingqvist & Nilsson 2015). This division would co-operate with RBOs and contribute to achieving their goals by sharing information and providing assistance to other divisions of the IWCO. This division would prepare and disseminate monthly reports, prepare annual performance reports for the executive board, and collaborate with other divisions to achieve the IWCO's targets.

7. TASKS

The IWCO would carry out tasks to accomplish its targets. These tasks are performed by its divisions.

7.1. Resolving hydropolitic disputes

Water is a resource that transcends political boundaries and has brought rival parties to the battlefield in the twenty-first century (Wolf & Hammer 2000). Preventing and resolving water conflicts requires a legal framework to guide and govern co-operation between states (Obengo 2016). The IWCO would create a peaceful and secure political space in the conflict zones by adopting and enforcing rules, maintaining, sustaining, reviewing, interpreting, and revising as needed previous agreements, recommending pathways to solutions, acting as mediator and arbitrator between the parties in conflicts, writing agreements, and resolving disputes. Therefore the IWCO would play various roles as a third party during these processes. The IWCO would serve as a legal authority where countries involved in water disputes would find impartial (without bias and preferences for any involved country), just (defending the rights of the involved parties), and fair (decisions are made according to established and accepted rules) resolutions.

7.2. Water quality monitoring

The water of suitable quality is imperative for sustainable socio-economic development (Bartram & Balance 1996). The quality of commercial water that is traded between countries would be part of the IWCO's jurisdiction. The IWCO would monitor the water quality in the environment and of the water used in trade by creating review committees that would rely on rules that comply with accepted standards and involve public participation that encourages the quality of governance (De Stefano *et al.* 2012) and essential to the global public. Water quality monitoring would include long-term, short-term, and continuous programs according to site-specific conditions.

7.3. Coordination of partner organizations

There are many international organizations with a variety of functions. A large number of these organizations has impeded effective coordination among them. The co-operation and coordination between these organizations – while maintaining their independence – would greatly improve their performances. The IWCO would create unified co-operation between them to achieve their objectives. Central to achieving co-operation would be regular meetings between the leaders of the organizations. The mechanism for prioritizing legal entities' benefits is based on some indicators. The IWCO would foster conditions that benefit its member countries. The IWCO would harmonize the differing priorities of involved entities. Electronic meetings are possible nowadays and have shown to be useful and practical, they reduce expensive travel, save time, decrease environmental impacts, and increase the number of actors in meetings. On the other hand, electronic water diplomacy can be problematic if online access is a barrier to participation. The IWCO would provide assistance to pertinent organizations financially, by coordinating their long-term programs, and by mediating agreements between these organizations. The long-term financial sustainability of the IWCO depends on the effectiveness of its economic division, which would support the participation of organizations in projects that yield benefits to the IWCO's members and improve the IWCO's financial viability (Yaari *et al.* 2015).

7.4. Response to crises and emergency response

Natural catastrophes exert a substantial and inevitable influence on modern society and frequently create dire conditions in many regions (Alexander 2017). Drought, floods, earthquakes, tsunamis, landslides, eruptions and other water-related disasters may be exacerbated by poor management. The IWCO would deliver aid to stricken communities to mitigate disaster impacts and expedite recovery. Also, the IWCO would co-operate with aid organizations – such as the International Committee of the Red Cross (ICRC) – to improve emergency response and relief to natural disasters. The IWCO would assist in preventing and reducing the damages caused by natural disasters by providing advice on short-term and long-term plans for the affected areas and by helping in their implementation. This approach, in addition to considering transboundary water problems, pays attention to the internal water problems of states. It would include various aspects such as management guides for water use. For example, the over-construction of dams in Iran or the degradation of Urmia Lake have created severe social, political, economic, and environmental disasters that the government cannot tackle effectively. The warnings and advice of the IWCO could alert officials about impending disasters. Identifying critical situations and launching response actions to natural disasters would be functions of the IWCO's board of directors.

7.5. Water pricing

Water pricing can play an influential role in the conservation of water resources and improving water use efficiency at the individual and social levels (Dinar & Subramanian 1997; Loárciga 2008). The cost of water supply varies across regions in

response to the law of supply and demand that reflects climatic and technological conditions. The IWCO would discourage unreasonable water pricing by recommending relatively low water rates for water use that meets basic functions (drinking, cooking, bathing, cleaning) and increasing rates for non-basic use. The IWCO would produce and disseminate reports concerning water pricing in different regions, providing recommendations for water pricing based on economic and social conditions. The need to modernize financial and technical systems, and the imperative to meet local needs while protecting the environment, are key elements, which are essential for sustainable tariffs (Yates *et al.* 2020). Paying attention to the key elements could lead to sustainable tariffs (Yates *et al.* 2020), increase the participation of people, improve the effectiveness of reports, and avoid top-down decision-making schemes.

7.6. Enactment and enforcement of rules

The development of a body of water rights and duties is an effective approach to regulate water use (Boelens 2008). Transboundary water rules play an important role in the transparency and predictability of multistate actions (Yaari *et al.* 2015). Various rules have been adopted that considered hydro-politics disputes, navigation, and water trade. These rules are often enacted at conventions by various organizations. Collecting and updating these rules, enacting new rules, classifying and integrating rules, and monitoring their implementation would enhance water use and management internationally. The IWCO would collect, classify, and integrate rules in the field of water management and use, and strive to enhance international standards by enacting new rules and monitoring rules enforcement. The IWCO would provide guidance for sound policy-making by promoting water management rules made by committees of experts with the co-operation of other water organizations. The selection of the members of these committees would be made by the Executive Board. Non-compliance with international rules would trigger IWCO's intervention by requesting compliance with established agreements. The IWCO would assist offended countries by applying its enforcement powers to ensure compliance with its rules. The Board of Directors could dismiss non-compliant governments from membership in the IWCO, or in the case of serious transgressions, would impose sanctions in co-operation with other international organizations.

7.7. Education

Education in the water field has grown in recent years, an example being the Water Education for Teachers (WET) project which trains school teachers and its mission is to reach children, parents, teachers and community members of the world about water and increase the awareness in this area to solve complex water issues (Sevebeck 1995). In this area, there are several centers (e.g., the European Regional Centre for Ecohydrology (ERCE), the International Centre for Water Resources and Global Change (ICWRGC)) under the supervision of UNESCO, which would be suitable IWCO partners. The IWCO would create and teach courses, would support academic disciplines, and assist in the creation of educational institutions. Elementary education can have a significant effect in preventing pollution and water waste (Simsekli 2015). Water education has a preventive effect that avoids water waste and pollution.

7.8. Research

Research is conducted around the world in the field of water. The IWCO would support the establishment of research agencies and initiatives to encourage scientific progress in the water field. These agencies could co-operate with the UN scientific agencies in various areas, leading to the exchange of information. The IWCO would co-operate with the United Nations University to extend its worldwide research networks, co-operate with the UNU-INWEH in launching on-the-ground projects, co-operate with the WHO and UNICEF to make progress toward the SDGs for drinking-water and sanitation, promote co-operation with the WHO to eradicate water-related diseases. The IWCO would support water research in the legal domain, water quality, and water resources management.

7.9. Environmental protection

The large scale and complexity of current environmental problems pose challenges in conservation biology, natural resource management, and environmental protection (Mckinley *et al.* 2016). Water health care is central to environmental protection. The IWCO would co-operate with environmental protection agencies around the world and with other active organizations in the field of conservation to ensure the health of world water resources. Arctic ice melts and the disappearance of glaciers, ocean pollution, drying of seas, climate change, wetland and swamp protection, lake, river and transboundary water management, groundwater management, and conservation of coastal zones are some of the present challenges the IWCO would

address seeking to assist in developing mitigation and adaptation strategies through international co-operation and monitoring.

7.10. Gender equality

Various instruments such as the UN Watercourses Convention have advocated a gender-balanced approach to governance (Earle & Bazilli 2013). Gender equality in the water sector is considered as the harbinger of greater efficiency, equity, and effectiveness (Singh *et al.* 2006). The IWCO would have a role in the further flourishing of gender equality. Closing the gender gap is possible by improving water security for food production. Promoting women's access to water, sanitation and hygiene in their workplaces, standing against gender-based violence at the time of collecting water (UNESCO 2021), promoting women's education, their equitable access to credit and insurance, providing accountability mechanisms and using them as agents for reporting on improved gender equity (Cap-Net 2014) are some examples of activities that the IWCO would participate in. Furthermore, there is a neglect of women in the case of representation, participation, and involvement in water institutions. Differences between women's and men's opinions can contribute to better decision-making in these institutions that would increase their social and economic standing, and enhance awareness of water management by more participation of women would provide gender balance (Khandker *et al.* 2020). Accordingly, the IWCO would promote gender balance as a measure of improved water management and societal evolution.

7.11. Water co-operation

From the perspective of environmental peacemaking environmental and water co-operation plays an important role in improving the relationships between states (Ide & Detges 2018). Water problems include many stakeholders who have various agendas and priorities, cross multiple physical and cultural boundaries, and face limitations in the case of political and jurisdictional issues. There are many issues such as water allocation decisions, upstream and downstream impacts of water pollution and water diversions, infrastructure development, overexploitation of water resources, and financing of water management, which necessitate water co-operation (UN WATER 2013). The IWCO would provide a suitable venue for co-operation. Achieving improved water management is possible by solving impediments to water co-operation to tackle water supply, water quality and water quantity, infrastructure development, climate change, economic growth, and financing (UN WATER 2013). Various benefits of water co-operation are decreasing costs by reducing tensions, promoting water storage and distribution techniques, positive effects on drought and flood management, and others (UN WATER 2013). The existence of other organizations like SIWI or UN Water, would help the IWCO to be effective in its mission.

8. AUTHORITY

The IWCO would have enforcement powers through its co-operation with other organizations such as the UN. The authority of the IWCO would be affected through informational activities, holding meetings to address and propose resolutions to issue of concerns, through the works of committees dealing with water and environmental issues, through water education campaigns, enactment of water rules, applying reforms and changes to water laws, intervention in water conflicts between countries, and in implementing sanctions against rogue states. The application of the IWCO's authority would be the responsibility of its Board of Directors. Member states would receive various benefits such as timely scientific and statistical information, secure assistance on water-related disasters, obtain training, and receive assistance in conflict resolution among other benefits, and they would not pay for membership (due to the IWCO's economic independence). In addition, the IWCO would have a peaceful function about transboundary water problems and increase water co-operation in this area. The decrease in political unrest in conflicted regions, and the growth of various economic activities which would be beneficial for the member countries would encourage states to join the IWCO. Each member state would accept the authority of the IWCO as a condition for membership. The authority of the IWCO may evolve according to redefined tasks and objectives by the consultation of its member states. Their roles in this subject might increase their enthusiasm for co-operation within this organization. The IWCO would rely on consultation, mediation, arbitration, and implementation of its authority in a just and fair manner to resolve water disputes involving member states, in consultation with other co-operating organizations. The independence of the IWCO in implementing its goals is imperative, and would require the oversight of an organization such as the UN. The UN would increase the independence and authority of the IWCO by supporting parts of its operational costs.

9. CONCLUSION

This essay proposed the creation of an IWCO. The IWCO's mandate statement is first explained and the objectives of the IWCO are evaluated. The IWCO's objectives would be to improve water use and management and to resolve hydro-political issues. The IWCO's structure was outlined along with its divisions charged to carry out the organization's tasks. Accordingly, the Board of Directors, Executive Board, Secretariat, Administrative, Affairs, Public Relations, Statistical services, Research, Cultural, Policy, Economic, and Environmental would be the divisions making up the organization. The IWCO tasks would include resolving hydro-political disputes, water quality monitoring, coordination of partner organizations, emergency response, water pricing, enactment and enforcement of rules, education, research, environmental protection, gender equality, and water co-operation. The IWCO's authority required to fulfill its tasks is described in this work. An IWCO in the field of water as herein proposed would address pressing water management challenges and facilitate conflict resolution in co-operation with other water international organizations. The presentation and analysis of proposals to create the IWCO deserves further study. Finally, evaluating water problems and conflicts around the world and classifying them based on their type, geographical area, duration of the conflict, underlying causes, and formulating responses to these problems would be central tasks of the IWCO.

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All authors accept all ethical approvals.

CONSENT TO PARTICIPATE

All authors consent to participate.

CONSENT TO PUBLISH

All authors consent to publish.

AUTHORS CONTRIBUTIONS

B.A. did software and formal analysis, wrote the original draft; O.B.-H. conceptualized and supervised the study; did project administration; H.A.L. validated the study; wrote, reviewed and edited the article.

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CONFLICT OF INTEREST

The authors declare there is no conflict.

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