

**Water on the Move:**  
An Analysis of International Bulk Water Trade  
and Its Implications on the Treatment and  
Conceptualization of Water

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A Thesis Submitted in Partial Fulfillment of the Requirements for the Award of Honors in  
International Politics, Edmund A. Walsh School of Foreign Service, Georgetown University,  
Spring 2021

**Abstract**

Mounting concerns regarding water scarcity have prompted claims likening fresh water to oil. Such comparisons, however, fail to recognize that, unlike oil—indeed, unlike nearly every other resource on Earth—potable fresh water is a non-substitutable and necessary precondition for life. Water scarcity concerns have also incited a debate regarding another conceptualization of water: water as an object of trade in the context of international bulk water trade. Such trade, which involves the transboundary obtainment and transfer of water resources that are valued and appraised in some way, has been identified as a means of sustainably balancing both intensifying water scarcity and increasing global water demand. Opponents of bulk water trade, however, argue that it threatens the preservation of water as a human right and limited unique resource. Diverging from this normative debate, this work investigates how parties to bulk water trade relations approach water as the object of such trade. It does so by compiling the first ever collection of successfully executed instances of international bulk water trade and analyzing case studies representative of varying approaches to such trade. It concludes that, although water is discernably treated as an economic good in the context of bulk water trade, this treatment is more nuanced and flexible than is suggested by bulk water trade's detractors. Additionally, this work finds that successful instances of bulk water trade offer insights that could significantly inform the development of an international framework for such trade.

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## Introduction

Growing concerns regarding water scarcity coupled with increasing global water demand have inspired claims designating water as “the new oil” and “the oil of the twenty-first century.”<sup>1</sup> Such comparisons ring especially salient when considering the possibility of actually shipping water internationally as cargo in the hulls of oil tankers. In fact, by the end of the twentieth century, there were already plans in place to turn such a possibility into a reality. In the late 1990s, McCurdy Enterprise, a Canadian company based in Newfoundland, sought to remove about 13 billion gallons of water from Gisborne Lake, transport the water five miles via pipelines to the Canadian town of Grand le Pierre, and load the water onto former single-hull oil tankers for international export.<sup>2</sup>

While McCurdy Enterprise’s attempt to ship water to the world ultimately failed, other entities, both private and public, have indeed succeed in internationally exporting fresh water in bulk. Such transboundary trade of fresh water,<sup>3</sup> known as bulk water trade, distinguishes itself from other economic exchanges of water, i.e., the international trade of water bottles and virtual water,<sup>4</sup> because it involves the appraisal and transfer of water as an item of trade in its own right. Water that is traded in this way is not purified, treated, bottled, or used as an input. It is simply

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<sup>1</sup> Rick Buckingham, “Water Will Become the Oil of the 21st Century,” September 2, 2008, <https://www.iatp.org/news/water-will-become-the-oil-of-the-21st-century>; “Running Dry,” *The Economist*, August 21, 2008, <http://www.economist.com/business/2008/08/21/running-dry>; Steven Solomon, “Water Is The New Oil,” *Huffington Post*, May 25, 2011, [https://www.huffpost.com/entry/water-is-the-new-oil\\_b\\_380803?guccounter=1&guce\\_referrer=aHR0cHM6Ly93d3cuZ29vZ2x1LmNvbS8&guce\\_referrer\\_sig=AQAAALPJCBolfVOHjsrijpcR79vb2kYueHITiOnahew5fXyDSrYvBO9j\\_4DHambBaBDXuu8Qv7xCNzwTY3ad\\_wsbyC2p2nZkYDj3nVxtLFdqJK-0N\\_1KgknAUfVTSwjweZezJNruzeGf6E8WHm3\\_oMezNerUAvDCEEKwtYI1uhRjCixg9](https://www.huffpost.com/entry/water-is-the-new-oil_b_380803?guccounter=1&guce_referrer=aHR0cHM6Ly93d3cuZ29vZ2x1LmNvbS8&guce_referrer_sig=AQAAALPJCBolfVOHjsrijpcR79vb2kYueHITiOnahew5fXyDSrYvBO9j_4DHambBaBDXuu8Qv7xCNzwTY3ad_wsbyC2p2nZkYDj3nVxtLFdqJK-0N_1KgknAUfVTSwjweZezJNruzeGf6E8WHm3_oMezNerUAvDCEEKwtYI1uhRjCixg9).

<sup>2</sup> Anthony Depalma, “Free Trade in Fresh Water? Canada Says No and Halts Exports (Published 1999),” *The New York Times*, March 8, 1999, sec. World, <https://www.nytimes.com/1999/03/08/world/free-trade-in-fresh-water-canada-says-no-and-halts-exports.html>.

<sup>3</sup> I use the term “water” to refer exclusively to fresh water throughout this work, unless otherwise specified.

<sup>4</sup> Virtual water, as will be explained later, refers to water that is used as an input in the production of goods or the execution of services. See Carole Dalin et al., “Evolution of the Global Virtual Water Trade Network,” *Proceedings of the National Academy of Sciences* 109, no. 16 (April 17, 2012): 5989–94, <https://doi.org/10.1073/pnas.1203176109>.

extracted from a natural source (e.g., a lake or river), given a set value, and transported using human-made infrastructure, such as pipelines, canals, and tankers.<sup>5</sup>

Proponents of bulk water trade highlight the opportunity it generates for populations in comparatively water-scarce areas of the world to import water from areas that are comparatively water-rich. Proponents also claim that bulk water trade can incentivize water conservation through the establishment of international water markets that enable water rights holders to profit from the sale of excess water saved after satisfying their own needs.<sup>6</sup> Citing these advantages, proponents of bulk water trade promote it as a means of addressing increasing global concerns of water scarcity and the unequal global distribution of freshwater resources.<sup>7</sup>

Opponents of bulk water trade argue against its realization, emphasizing water's status as an essential resource, critical to the production of everything from food to energy. They base their opposition in part on the claim that such trade would result in the treatment of the life-giving resource as an economic good and would *ipso facto* transform it into a commodity, thereby threatening the world's limited supply of fresh water. Opponents further maintain that bulk water trade would result in the destruction of ecosystems and incentivize unsustainable water withdrawals in the pursuit of profit.<sup>8</sup> Bulk water trade detractors also point to the potential application of General Agreement on Tariffs and Trade (GATT)/World Trade Organization

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<sup>5</sup> Piotr Szwedo, *Cross-Border Water Trade: Legal and Interdisciplinary Perspectives*, Queen Mary Studies in International Law, volume 32 (Leiden ; Boston: Brill/Nijhoff, 2019), 6.

<sup>6</sup> Peter H Gleick et al., "New Economy of Water: The Risks and Benefits of Globalization and Privatization of Fresh Water" (Pacific Institute for Studies in Development, Environment, and Security, February 2002), [https://pacinst.org/wp-content/uploads/2013/02/new\\_economy\\_of\\_water3.pdf](https://pacinst.org/wp-content/uploads/2013/02/new_economy_of_water3.pdf); Edith Brown Weiss, *International Law for a Water-Scarce World*, vol. 7 (Leiden ; Boston: The Hague Academy of International Law, 2013).

<sup>7</sup>Szwedo, 3.

<sup>8</sup> Saule Bakenova, "Interpreting the Emergence of Water Export Policy in Canada," *Politics & Policy* 36, no. 4 (2008): 676–719, <https://doi.org/10.1111/j.1747-1346.2008.00125.x>; David Johansen, "Bulk Water Removals, Water Exports and the NAFTA," Background Papers (Library of Parliament Law and Government Division, January 31, 2002), <http://www.publications.gc.ca/Collection-R/LoPBdP/BP/prb0041-e.htm>; Brent Patterson, "Concerns about Bulk Water Exports to the U.S. Resurface," The Council of Canadians, 2014, <https://canadians.org/analysis/concerns-about-bulk-water-exports-us-resurface>.

(WTO) provisions and principles to bulk water trade as additional support for their opposition. According to detractors, such application would not only detrimentally restrict a country's sovereign control over its national water resources but also formally induct water as a “good” or “product,” thereby likening it—to some degree—to recognized goods and products under the GATT/WTO, such as wine or biodiesel.<sup>9</sup>

While bulk water trade negotiations and considerations have garnered increased attention in the news media over the past decade,<sup>10</sup> scholarship on the topic remains limited—both in scope and quantity. While publications on bulk water trade do exist, they focus mainly on its feasibility and the normative debate concerning its implementation. An important element of this debate is the theorization regarding the potential implications of applying existing international trade law to such trade. There remains, however a paucity of literature examining *actual* instances of bulk water

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<sup>9</sup> Request for Consultation by Australia, *Canada - Measures Governing the Sale of Wine in Grocery Stores*, WTO Doc. WT/DS520/5 (February 1, 2017), [https://www.wto.org/english/tratop\\_e/dispu\\_e/cases\\_e/ds520\\_e.htm](https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds520_e.htm); Addendum to the Status Report by the European Union, *European Union - Anti-Dumping Measures on Biodiesel from Argentina*, WTO Doc. WT/DS473/177/Add.4 (October 13, 2017), [https://www.wto.org/english/tratop\\_e/dispu\\_e/cases\\_e/ds473\\_e.htm](https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds473_e.htm); Patterson, “Concerns about Bulk Water Exports to the U.S. Resurface”; Cynthia Baumann, “Water Wars: Canada’s Upstream Battle to Ban Bulk Water Export,” *Minnesota Journal of Global Trade* 10 (2001): 109; Hubert Savenije and Pieter van der Zaag, “Water as an Economic Good and Demand Management Paradigms with Pitfalls,” *Water International - WATER INT* 27 (March 1, 2002): 98–104, <https://doi.org/10.1080/02508060208686982>.

<sup>10</sup> See, *inter alia*, “From Iceland — Wants To Export Icelandic Water To Asia,” The Reykjavik Grapevine, June 7, 2016, <https://grapevine.is/news/2016/06/07/wants-to-export-icelandic-water-to-asia/>; Peter H Gleick et al., “New Economy of Water: The Risks and Benefits of Globalization and Privatization of Fresh Water” (Pacific Institute for Studies in Development, Environment, and Security, February 2002), 13–14, [https://pacinst.org/wp-content/uploads/2013/02/new\\_economy\\_of\\_water3.pdf](https://pacinst.org/wp-content/uploads/2013/02/new_economy_of_water3.pdf); Dalia Hatuqa, “Water Deal Tightens Israel’s Control over Palestinians,” accessed December 8, 2020, <https://www.aljazeera.com/features/2017/8/1/water-deal-tightens-israels-control-over-palestinians>; “Israel Signs Agreement to Buy Bulk Water from Manavgat, Turkey,” accessed October 27, 2020, <https://www.iatp.org/news/israel-signs-agreement-to-buy-bulk-water-from-manavgat-turkey>; John Vidal, “Israeli ‘water for Arms’ Deal with Turkey,” the Guardian, January 6, 2004, <http://www.theguardian.com/world/2004/jan/06/turkey.israel>; Alexis C. Madrigal, “Alaska Company Plans to Ship Small Town’s Extra Water to India,” The Atlantic, July 13, 2010, <https://www.theatlantic.com/technology/archive/2010/07/alaska-company-plans-to-ship-small-towns-extra-water-to-india/59663/>; Konuralp Pamukcu, “Water Trade between Israel and Turkey: A Start in the Middle East?,” *Middle East Policy* X, no. 5 (Winter 2003), <https://mepc.org/journal/water-trade-between-israel-and-turkey-start-middle-east>; Reuters Staff, “Spanish Region May Ship Water to Relieve Drought,” *Reuters*, April 4, 2008, <https://www.reuters.com/article/us-spain-drought-idUSL0482214120080404>; Brett Walton, “Bulk Water Exports: Alaska City Wants to Sell the World a Drink,” *Circle of Blue* (blog), June 2, 2010, <https://www.circleofblue.org/2010/world/bulk-water-exports-alaska-city-wants-to-sell-the-world-a-drink/>.

trade and their implications for the future of water resource management.<sup>11</sup> Intensifying concerns of water scarcity and the potential for bulk water trade to serve as a strategy for confronting these concerns necessitate a more thorough analysis of such trade and its implications for the way in which water is defined, conceptualized, and treated.<sup>12</sup>

In this work, I attempt to shift the conversation regarding bulk water trade away from theoretical considerations by instead focusing on the real-world implications of such trade for the conceptualization and treatment of water. To do so, I examine actual instances of bulk water trade and attempt to answer two guiding research questions: 1) how do parties to international bulk water trade relations approach water as the object of such trade and 2) how can past and present instances of bulk water trade inform the development of a framework for the regulation of such trade at the international level?

I address these questions by analyzing actual instances of bulk water trade, reviewing varying conceptualizations of water based on its diverse characteristics, uses, and services, and examining a diverse selection of water trade case studies. I discuss the execution and results of my analyses in this work, which is organized into three parts that are further divided into chapters. Part 1 details the design of and necessary background for the research discussed in this work. There

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<sup>11</sup> Gabriel E. Eckstein, background/informational interview by Anna Zolyniak, January 2, 2020, over the phone.

<sup>12</sup> According to Strong et al., about fifty-two percent of the world's population is expected to live in water-stressed regions by 2050, a trend that is due in no small part to anthropogenic climate change. This reality is exasperated further by the uneven global distribution of freshwater and mounting population pressures. For example, India has over 17 percent of the world's population but only four percent of its freshwater. Canada, on the other hand, has less than half of a percent of the world's population but about 20 percent of its freshwater. See Colin Strong et al., "Mapping Public Water Management by Harmonizing and Sharing Corporate Water Risk Information," August 3, 2018, <https://www.wri.org/publication/mapping-public-water>; Hannah Ritchie and Max Roser, "Water Use and Stress," *Our World in Data*, November 20, 2017, <https://ourworldindata.org/water-use-stress>; "India Population (2020) - Worldometer," accessed December 8, 2020, <https://www.worldometers.info/world-population/india-population/>; "Water - India Facts | International Development Enterprises (India)," accessed December 8, 2020, <http://www.ide-india.org/content/water-india-facts>; "Canada Population (2020) - Worldometer," accessed December 8, 2020, <https://www.worldometers.info/world-population/canada-population/>; Alan Freeman, "Canada Has 20 Percent of the Planet's Freshwater. But Some Worry There's Not Enough to Go around.," *Washington Post*, accessed December 8, 2020, <https://www.washingtonpost.com/news/worldviews/wp/2016/10/14/canada-has-20-percent-of-the-planets-freshwater-but-some-worry-theres-not-enough-to-go-around/>.

are four chapters in Part 1: Chapter 1.1, which consists of a literature review and lays forth an operationalization of critical concepts; Chapter 1.2, which discusses research methods and materials; Chapter 1.3, which introduces and explains the selection of case studies that will be examined in this work; and Chapter 1.4, which presents two hypotheses that address each of my research questions and serve as the points of departure for this work.

Part 2 focuses on the actual analysis of relevant data and materials. It is divided into four chapters. Chapter 2.1 introduces the International Bulk Water Trade Bank (IBWTB), which serves as the most comprehensive collection of executed instances of bulk water trade to date, reviews the methodology used to create it, and discusses its importance. Chapter 2.1 also introduces a typology for the classification and study of bulk water trade relations that helps inform my selection and analysis of case studies. I then examine how water is conceptualized, or “defined,”<sup>13</sup> within the context of various primary and subsidiary sources of international law and other significant texts relating to the use and management of water resources in Chapter 2.2. In Chapter 2.3., I present my review of case studies. Chapter 2.4, the final chapter in Part 2, presents and discusses this work’s significant findings and evaluates their relevance in answering the two guiding research questions mentioned above.

Part 3 consists of only one chapter, Chapter 3.1, which offers a concluding summary of this work’s analyses and implications and posits potential avenues for additional research.

## **Part 1: Foundational Background and Research Design**

### *Chapter 1.1: Literature Review and Operationalization of Concepts*

#### **Section 1.1.1: Managing Scarce Global Water Resources**

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<sup>13</sup> I clarify what is meant by the “defining” of water in Chapter 2.2.



Changing environmental realities resulting in exacerbated concerns over water scarcity have inspired greater scholarly attention regarding the management of global freshwater resources.<sup>14</sup> Recognizing the amplification of water scarcity concerns in a world where water resources are unevenly distributed and increasingly threatened by climate change, water scholars have sought to identify methods by which such resources can be more effectively and sustainably used and managed.<sup>15</sup> On the more technical side, scholars such as Berghoff and Negri and Hanchar have examined the development and deployment of new technologies and water use practices that promote water conservation.<sup>16</sup>

On the administrative side, suggested methods for improving the management of international water resources have included: increasing bilateral and multilateral cooperation; implementing basin-wide approaches to water management; and improving the exchange of water quality and quantity data.<sup>17</sup> Glennon, Gleick, Gleick et al., Palaniappan et al., Zaki and Nurual Amin, and others have also examined the possible application of water pricing and privatization for achieving sustainable water use and management.<sup>18</sup> Accounting for the unequal global

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<sup>14</sup> Laurence Boisson de Chazournes, *Fresh Water in International Law*, Reprint (Oxford, United Kingdom: Oxford University Press, 2015).

<sup>15</sup> Gabriel E. Eckstein, "Water Scarcity, Conflict, and Security in a Climate Change World: Challenges and Opportunities for International Law and Policy," *Wisconsin International Law Journal* 27, no. 3 (2010 2009): 411–15.

<sup>16</sup> Ryan Berghoff, "A Technology-Based Approach to Water Conservation in California," *JOURNAL OF ENVIRONMENTAL LAW* 33 (n.d.): 40; Donald H. Negri and John J. Hanchar, "Water Conservation Through Irrigation Technology," n.d., 13.

<sup>17</sup> Eckstein, "Water Scarcity, Conflict, and Security in a Climate Change World"; Andrea K. Gerlak, Jonathan Lautze, and Mark Giordano, "Water Resources Data and Information Exchange in Transboundary Water Treaties," *International Environmental Agreements: Politics, Law and Economics* 11, no. 2 (May 1, 2011): 179–99, <https://doi.org/10.1007/s10784-010-9144-4>; Itay Fischhendler, "Legal and Institutional Adaptation to Climate Uncertainty: A Study of International Rivers," *Water Policy* 6 (August 1, 2004), <https://doi.org/10.2166/wp.2004.0019>; Alena Drieschova, Mark Giordano, and Itay Fischhendler, "Governance Mechanisms to Address Flow Variability in Water Treaties," *Global Environmental Change* 18, no. 2 (May 1, 2008): 285–95, <https://doi.org/10.1016/j.gloenvcha.2008.01.005>.

<sup>18</sup> Robert Glennon, "Water Scarcity, Marketing, and Privatization," *Texas Law Review* 83 (2005 2004): 1873; Peter H. Gleick, "Global Freshwater Resources: Soft-Path Solutions for the 21st Century," *Science (New York, N.Y.)* 302, no. 5650 (November 28, 2003): 1524–28, <https://doi.org/10.1126/science.1089967>; Gleick et al., "New Economy of Water: The Risks and Benefits of Globalization and Privatization of Fresh Water," 22–23, 26; Meena Palaniappan et

distribution of freshwater resources, Chapagain et al. discuss and demonstrate the potential for countries to conserve scarce domestic freshwater resources by importing water-intensive products, particularly foods such as cereals.<sup>19</sup> However, as water scarcity increasingly manifests itself as a reality rather than an impending threat, more countries have come to entertain the idea of treating fresh water as an item of trade in itself—that is, to engage in bulk water trade.<sup>20</sup> In this work, I use the term “water” to refer to fresh water, including in the context of bulk water trade, unless otherwise noted.

### **Section 1.1.2: Types of Water Trade**

Bulk water trade occupies a subcategory within the umbrella concept of “water trade.” Water trade can generally be thought of as an economic relationship between two or more parties involving the export and import of water in some capacity. The term “water trade” may be understood to encompass the trade of virtual water, bottled water, water rights, and bulk water.<sup>21</sup>

#### Virtual Water

Brown Weiss and Slobodian define virtual water as “the amount of water used to produce a given product.”<sup>22</sup> Virtual water can also be understood as the water “‘embodied’ in a product”

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al., “Water Privatization Principles and Practices,” in *The World’s Water 2004-2005*, vol. 4, 9 vols., The World’s Water: The Biennial Report on Freshwater Resources (Washington, D.C.: Island Press, 2004); Saeed Zaki and A. T. M. Nurul Amin, “Does Basic Services Privatisation Benefit the Urban Poor? Some Evidence from Water Supply Privatisation in Thailand,” *Urban Studies* 46, no. 11 (October 2009): 2301–27.

<sup>19</sup> A.K. Chapagain, A.Y. Hoekstra, and H.H.G. Savenije, “Saving Water Through Global Trade,” VALUE OF WATER RESEARCH REPORT SERIES (UNESCO-IHE Delft, September 2005), <https://www.waterfootprint.org/media/downloads/Report17.pdf>; A. Y. Hoekstra and P.Q. Hung, “Virtual Water Trade: A Qualification of Virtual Water Flows Between Nations in Relation to International Crop Trade” (IHE DELFT, September 2002), <http://www.ayhoekstra.nl/pubs/Report11.pdf>.

<sup>20</sup> Maude Barlow, “THE GLOBAL TRADE IN WATER from the Booklet Blue Gold, The Global Water Crisis and the Commodification of the World’s Water Supply, A Special Report Issued by the International Forum on Globalization (IFG),” *Third World Traveler*, accessed September 13, 2020, [http://www.thirdworldtraveler.com/Water/Global\\_Trade\\_BG.html](http://www.thirdworldtraveler.com/Water/Global_Trade_BG.html).

<sup>21</sup> Alix Gowlland Gualtieri, “LEGAL IMPLICATIONS OF TRADE IN ‘REAL’ AND ‘VIRTUAL’ WATER RESOURCES,” ed. International Environmental Law Research Centre, *IELRC WORKING PAPER*, no. 2 (2008): 1-19, <http://www.ielrc.org/content/w0802.pdf>.

<sup>22</sup> E. B. Weiss and L. Slobodian, “Virtual Water, Water Scarcity, and International Trade Law,” *Journal of International Economic Law* 17, no. 4 (December 1, 2014): 717–37, <https://doi.org/10.1093/jiel/jgu038>.

and “needed for the production of the product.”<sup>23</sup> Examples of virtual water include the water used to grow wheat or manufacture cell phones.<sup>24</sup> Virtual water *trade* occurs when the good or product produced using water, thereby virtually containing water, is itself traded.<sup>25</sup> When a country imports wheat, for example, it is “virtually” importing the water resources that went into the production of that wheat. Hoekstra presents virtual water as “an alternative source of water,” one that can be imported by a water-scare country to “relieve the pressure on [its] own water resources.”<sup>26</sup>

The notion of fulfilling domestic water demand through the trade of virtual water is further elucidated by Brown Weiss and Slobodian, who claim that “countries with limited fresh water supplies” can meet their water needs by importing “goods that are water-intensive” (i.e., importing virtual water) from countries with “plentiful water resources.”<sup>27</sup> Chapagain et al. illustrate how such water trade also reduces pressures on water resources at the international level by demonstrating that “global virtual water trade” actually results in the conservation of global water resources, or “global water saving.”<sup>28</sup> According to Hoekstra, such water saving is made possible by more efficient water use resulting from the comparative economic advantages realized through such trade.<sup>29</sup>

### Bottled Water

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<sup>23</sup> A. Y. Hoekstra, “Virtual Water: An Introduction,” in *Virtual Water Trade: Proceedings of the International Export Meeting on Virtual Water Trade*, vol. 12, Value of Water Research Report Series (IHE Delft, IHE Delft, The Netherlands: IHE Delft, 2003), 13, [https://www.worldwatercouncil.org/fileadmin/www/Programs/Virtual\\_Water/VirtualWater\\_Proceedings\\_IHE.pdf#page=13](https://www.worldwatercouncil.org/fileadmin/www/Programs/Virtual_Water/VirtualWater_Proceedings_IHE.pdf#page=13).

<sup>24</sup> Water Footprint Network, “What Is Virtual Water?,” Water Footprint Calculator, December 20, 2019, <https://www.watercalculator.org/footprint/what-is-virtual-water/>; Peter Hanlon, “GRACE Launches New Water Footprint Calculator,” Water Footprint Network, 2015, /en/about-us/news/news/grace-launches-new-water-footprint-calculator/.

<sup>25</sup> Weiss and Slobodian, “Virtual Water, Water Scarcity, and International Trade Law,” 719.

<sup>26</sup> Hoekstra, “Virtual Water: An Introduction,” 14.

<sup>27</sup> Weiss and Slobodian, “Virtual Water, Water Scarcity, and International Trade Law,” 702, 719.

<sup>28</sup> Chapagain, Hoekstra, and Savenije, “Saving Water Through Global Trade,” 10.

<sup>29</sup> Hoekstra, “Virtual Water: An Introduction,” 14.

According to Gualtieri, water is most often traded after being transformed in some way upon its “removal from a natural or bulk state.”<sup>30</sup> Bottled water and other packaged, water-containing drinks (e.g., sodas and juices) represent the most common manifestations of such a transformation.<sup>31</sup> Bottled water is water that is removed from a water source, purified or treated in some way, and packaged for commercial sale. Bottled water *trade* refers to the commercial trade of that treated and packaged water.<sup>32</sup> As of 2021, Aquafina, currently owned by PepsiCo, is the single largest brand of bottled water in the world. Based in Wichita, Kansas, the company grosses \$872 million in global sales of bottled water annually.<sup>33</sup>

### Water Rights

The third classification of water trade, that of water rights trading, involves the sale and transfer of rights to a specific amount and/or source of water from an initial rights holder to a rights buyer. Water rights can be sold for a limited or indefinite amount of time. The trade of water rights often employs “water banks.” Possessors of water rights use water banks to metaphorically “store” excess water.<sup>34</sup> Owners of water banks can then “sell” their rights to the excess water on a water market, which connects water rights sellers with interested buyers.<sup>35</sup>

Gleick highlights the role water markets can play as so-called “soft-path” approaches to the management of limited global water resources.<sup>36</sup> Scholars such as Zekri and Easter and

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<sup>30</sup> Gualtieri, “LEGAL IMPLICATIONS OF TRADE IN ‘REAL’ AND ‘VIRTUAL’ WATER RESOURCES,” 2.

<sup>31</sup> Gualtieri, 2–3.

<sup>32</sup> Catherine Ferrier, “Bottled Water: Understanding a Social Phenomenon,” Discussion paper (WWF, April 2001), [http://awsassets.panda.org/downloads/bottled\\_water.pdf](http://awsassets.panda.org/downloads/bottled_water.pdf).

<sup>33</sup> Juline Alvin, “10 Largest Bottled Water Companies In The World,” Zippa, February 17, 2021, <https://www.zippa.com/advice/largest-bottled-water-companies/>.

<sup>34</sup> Here, excess water refers to a quantity of water that water right holders have a right to use but that supersedes their present needs.

<sup>35</sup> Gui-liang Tian et al., “Water Rights Trading: A New Approach to Dealing with Trans-Boundary Water Conflicts in River Basins,” *Water Policy* 22, no. 2 (April 1, 2020): 133–52, <https://doi.org/10.2166/wp.2020.180>.

<sup>36</sup> Soft-path approaches to water management refer to approaches that “rely on carefully planned and managed centralized infrastructure but” that compliment such reliance “with small-scale decentralized facilities.” See: Peter H. Gleick, “Global Freshwater Resources: Soft-Path Solutions for the 21st Century,” *Science* 302, no. 5650 (November 28, 2003): 1526, <https://doi.org/10.1126/science.1089967>.

Hernandez-Mora and Del Moral discuss how water markets can contribute to the sustainable management of water resources by incentivizing water users to use water resources more efficiently through the introduction of water-pricing schemes.<sup>37</sup> While Endo et al. explore the universal legal and policy prerequisites for the establishment of intranational water rights trading regimes, a handful of countries have already integrated water rights trading and water markets into the management of their domestic water resources.<sup>38</sup> These include Spain,<sup>39</sup> Chile, Australia, and parts of the United States.<sup>40</sup>

### Bulk Water

This work focuses on a fourth kind of water trade: bulk water trade. Bulk water trade is defined in the context of this work as *the physical transport of untreated, unbottled water that is valued and appraised as the object of trade in its own right*.<sup>41</sup> This definition is largely based on that of Güler, who defines bulk water trade as the large-scale transfer and transport of untreated, unbottled water resources out of the “catchment areas”<sup>42</sup> of one country into another country through the opening of a channel, construction of pipelines, use of tanker ships, or other form of

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<sup>37</sup> Nuria Hernández-Mora and Leandro Del Moral, “Developing Markets for Water Reallocation: Revisiting the Experience of Spanish Water Mercantilización - ScienceDirect,” *Geoforum* 62 (June 2015): 143–55; Slim Zekri and K. William Easter, “Water Reforms in Developing Countries: Management Transfers, Private Operators and Water Markets,” *Water Policy* 9, no. 6 (2007): 573–89, <https://doi.org/10.2166/wp.2007.127>.

<sup>38</sup> Takahiro Endo et al., “Are Water Markets Globally Applicable?,” *Environmental Research Letters* 13, no. 3 (March 2018): 034032, <https://doi.org/10.1088/1748-9326/aaac08>.

<sup>39</sup> Hernández-Mora and Del Moral, “Developing Markets for Water Reallocation: Revisiting the Experience of Spanish Water Mercantilización - ScienceDirect,” 143.

<sup>40</sup> Endo et al., “Are Water Markets Globally Applicable?,” 2.

<sup>41</sup> I clarify what is meant by “economic good” in Section 1.1.4.

<sup>42</sup> According to the European Environment Agency, a catchment area is the geographic area of land bounded by watersheds draining into a river, basin, or reservoir. See: “Catchment Area — European Environment Agency,” HelpCenter Definition, accessed September 14, 2020, <https://www.eea.europa.eu/archived/archived-content-water-topic/wise-help-centre/glossary-definitions/catchment-area>.

human intervention.<sup>43</sup> Parties of bulk water trade can include private companies and national, regional, and local governments.<sup>44</sup>

### Section 1.1.3: Defining Bulk Water Trade

Güler's definition emphasizes the physical transfer of water in bulk out of its natural state within a water source, effectively differentiating bulk water trade from international water relations concerning the intra-basin co-management of transnational water resources. The latter refers to international water relations governed by water sharing agreements articulating principles for the peaceful and responsible sharing of water resources among riparian states.<sup>45</sup> An example of such relations is the co-management of the Mekong River by Cambodia, Laos, Thailand, and Vietnam according to the terms of the 1995 Agreement on the Cooperation for the Sustainable Development of the Mekong River Basin.<sup>46</sup> Agreements governing such relations may also pertain to the transfer of claims to water between riparian states, as is the case between Egypt and Sudan regarding the Nile River and between India and Bangladesh regarding the Ganges River.<sup>47</sup>

In defining bulk water trade, however, this work further distills Güler's definition. Specifically, it employs a more refined definition that includes the requirement of the valuation and appraisal of water as the object of trade in its own right. This is done in order to distinguish bulk water *trade* from non-economic, inter-basin bulk water *transfers*. Inter-basin bulk water

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<sup>43</sup> Mehmet Çağatay Güler, "Bulk Water Transfer," *World Water Diplomacy & Science News*, October 5, 2016, [https://www.researchgate.net/publication/321292643\\_Bulk\\_Water\\_Transfer](https://www.researchgate.net/publication/321292643_Bulk_Water_Transfer).

<sup>44</sup> This information is based on my assessment of actual instances of bulk water trade included in the IBWTB introduced in Chapter 2.1.

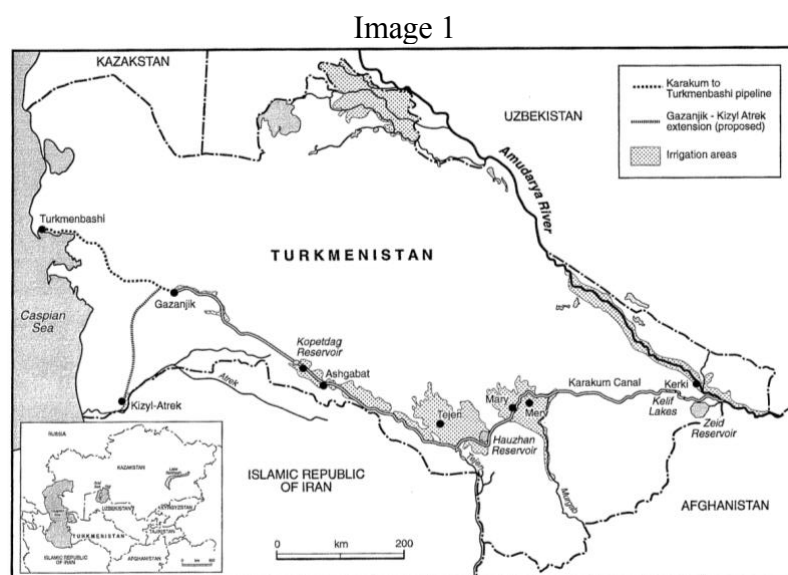
<sup>45</sup> Riparian states are states that share access to a common body of freshwater. For example, Ethiopia and Egypt are both riparian states of the Nile River. Simon E. Cook et al., "Water, Food and Livelihoods in River Basins," *Water International* 34, no. 1 (February 18, 2009): 13–29, <https://doi.org/10.1080/02508060802673860>.

<sup>46</sup> Agreement on the Cooperation for the Sustainable Development of the Mekong River Basin, April 5, 1995, 2069 U.N.T.S. 3: <https://treaties.un.org/doc/Publication/UNTS/Volume%202069/v2069.pdf>.

<sup>47</sup> Anik Bhaduri and Edward B. Barbier, "International Water Transfer and Sharing: The Case of the Ganges River," *Environment and Development Economics* 13, no. 1 (February 2008): 29–30, <https://doi.org/10.1017/S1355770X07004056>.

transfers involve the physical transfer of water resources out of the territory of one water source and into that of another. Such water transfers may also involve the diversion of water out of a given water source system, such as a river basin, through the creation of canals, reservoirs, and other alterations to the natural flow of water.<sup>48</sup>

An example of inter-basin bulk water transfer is the system of integrated water management and transfer supported by the Kara Kum Canal. The canal, which is the largest in the world, transfers water out of the Amu Darya, Murghab, and Tedzhen river basins and transports it across Turkmenistan. It starts where the Amu Darya River enters Turkmenistan from Uzbekistan,<sup>49</sup> delivers water to the capital city of Ashgabat, and ends in the Turkmen city of Gökdepe.<sup>50</sup> The waters from the canal are then transported via pipeline to the Caspian Sea, as is shown in Image 1.



Source: O'Hara and Hannan ©<sup>51</sup>

<sup>48</sup> Bhaduri and Barbier, "International Water Transfer and Sharing"; Cook et al., "Water, Food and Livelihoods in River Basins," 30.

<sup>49</sup> FAO AQUASTAT, "Transboundary River Basin Overview – Aral Sea" (Rome, Italy: Food and Agriculture Organization of the United Nations, 2012), 9, <http://www.fao.org/3/CA2139EN/ca2139en.pdf>.

<sup>50</sup> The Editors of Encyclopaedia Britannica, "Karakum Canal | Canal, Turkmenistan," Encyclopaedia Britannica, July 20, 1998, <https://www.britannica.com/topic/Karakum-Canal>.

<sup>51</sup> Sarah L. O'Hara and Tim Hannan, "Irrigation and Water Management in Turkmenistan: Past Systems, Present Problems and Future Scenarios," *Europe-Asia Studies* 51, no. 1 (1999): 21–41. Copyright © University of Glasgow, reprinted by permission of Taylor & Francis Ltd, <http://www.tandfonline.com> on behalf of University of Glasgow.

Although such inter-basin transfers satisfy the first criterium of this work’s definition of bulk water trade, they *do not* involve the assigning of a price or other measure of value to a set quantity of water. Bulk water trades, on the other hand, *do* involve such valuation and appraisal of water resources and the exchange of those resources for something reflective of their determined value. Therefore, such inter-basin water transfers are distinct from bulk water trades.<sup>52</sup> Through the valuation and economic exchange of water, water itself becomes the object of trade in the context of bulk water trade.

In sum, bulk water trade differs from the intra-basin co-management of transnational water resources and inter-basin water *transfers* in that bulk water trade refers to the extraction of water from a water source, the appraisal of that water based on terms agreed upon by relevant parties, and the transfer of that water from one location to another (e.g., from the point of extraction in an exporting country to the point of receipt in an importing country). *International* bulk water trade simply refers to bulk water trade that occurs across international boundaries. Going forward, I employ the general term “bulk water trade” to refer to *international* bulk water trade, unless otherwise noted.

#### **Section 1.1.4: Prior Literature on Bulk water Trade Relations and Foundational Definitions**

The geopolitical implications of and the international legal principles relevant to the intra-basin co-management of transnational water resources and inter-basin water *transfers* have been discussed at length in the works of Wolf, Giordano et al., Yoffe et al., Eckstein, Abrams, and others.<sup>53</sup> Compared to the sizable body of literature on these topics, bulk water trade has

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<sup>52</sup> Vujica Yevjevich, “Water Diversions and Interbasin Transfers,” *Water International* 26, no. 3 (September 1, 2001): 342–48, <https://doi.org/10.1080/02508060108686926>.

<sup>53</sup> See, *inter alia*: Gleick et al., “New Economy of Water: The Risks and Benefits of Globalization and Privatization of Fresh Water”; Mark Giordano et al., “A Review of the Evolution and State of Transboundary Freshwater Treaties,” *International Environmental Agreements : Politics, Law and Economics; Dordrecht* 14, no. 3 (2014):



received far less academic attention. Nevertheless, bulk water trade has been the focus of several scholarly publications. Literature on bulk water trade, however, has largely focused on either 1) the feasibility of such trade or 2) the normative debate regarding whether countries *should* engage in it.

Regarding the first focus, Anderson and Landry, Brown Weiss, Chong and Sunding, Gleick et al., Davidge, McNiven, and others have all discussed the technological and economic barriers of exporting bulk water internationally.<sup>54</sup> According to Anderson and Landry, the immense costs associated with bulk water removal and trade are likely to remain prohibitive without domestic policy reforms that permit individuals in water-rich regions to realize the economic gains of selling water and establishing “clearly defined and tradable water rights.”<sup>55</sup> Gualtieri, on the other hand, identifies an “increasing momentum for the establishment of an international water market” that, in his opinion, supports predictions of “large-scale water transfers between states” in the near future.<sup>56</sup> Towards the more extreme end of this perspective, Barlow, accounting for modern economic globalization, finds the notion of economically unfeasible transboundary bulk water exports to be “a myth.”<sup>57</sup>

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245–64, <http://dx.doi.org/10.1007/s10784-013-9211-8>; Shira Yoffe, Aaron T. Wolf, and Mark Giordano, “Conflict and Cooperation over International Freshwater Resources: Indicators of Basins at Risk1,” *Journal of the American Water Resources Association; Middleburg* 39, no. 5 (October 2003): 1109–26; Eckstein, “Water Scarcity, Conflict, and Security in a Climate Change World,” 436–54; Robert Haskell Abrams, “Interbasin Transfer in a Riparian Jurisdiction,” *WILLIAM AND MARY LAW REVIEW* 24 (n.d.): 34.

<sup>54</sup> Terry L Anderson and Clay J Landry, “Exporting Water to the World,” n.d., <https://core.ac.uk/download/pdf/60534724.pdf>; Edith Brown Weiss, *International Law for a Water-Scarce World*, vol. 7 (Leiden ; Boston: The Hague Academy of International Law, 2013), 251; Howard Chong and David Sunding, “Water Markets and Trading,” *Annual Review of Environment and Resources* 31, no. 1 (2006): 239–64, <https://doi.org/10.1146/annurev.energy.31.020105.100323>; Gleick et al., “New Economy of Water: The Risks and Benefits of Globalization and Privatization of Fresh Water,” 13; James McNiven, “Bulk Water Exports: Environmental Concerns and Business Realities,” n.d., 12; Ric Davidge, “Water Exports” (Water Bank, 1994), <http://www.waterbank.com/Newsletters/nws12.html>.

<sup>55</sup> Anderson and Landry, “Exporting Water to the World,” n.d., 61–62.

<sup>56</sup> Gualtieri, “LEGAL IMPLICATIONS OF TRADE IN ‘REAL’ AND ‘VIRTUAL’ WATER RESOURCES,” 3–4.

<sup>57</sup> Barlow, “THE GLOBAL TRADE IN WATER from the Booklet Blue Gold The Global Water Crisis and the Commodification of the World’s Water Supply A Special Report Issued by the International Forum on Globalization (IFG),” 13.

The second focus of bulk water trade literature, that of the normative debate surrounding such trade, is based on two inter-related considerations: 1) whether water is treated as an “economic good” in the context of bulk water trade, thereby resulting in its “commodification,”<sup>58</sup> and 2) whether such treatment undermines water’s “special status” as a human right and a unique and essential resource. It is important to pause here and define what is meant by these terms.

### Economic Good

An economic good is one that is “allocated across competing uses in a way that maximizes its value to society.”<sup>59</sup> According to Gleick, “such allocation can take place through markets,” non-market processes, or a combination of the two.<sup>60</sup> In his theory on water as an economic good, Briscoe defines economic goods as goods that “are exchanged between buyers and sellers under a specific set of conditions.”<sup>61</sup> According to Briscoe, “the idea of water as an economic good” is founded on the conditions that “water has a value to users” and that these users are “willing to ‘pay’ for it” according to that value.<sup>62</sup> Water is therefore treated as an economic good when parties interested in obtaining and transferring it have agreed to represent its value in a way that allows for its exchange according to set terms.

### Commodification and Commodity

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<sup>58</sup> Generally speaking, commodification refers to the transformation of a tangible or non-tangible item or act into a commodity. Karl Marx defined the processes of becoming a commodity as one whereby “a product must be transferred to another, whom it will serve as a use-value, by means of exchange.” According to Marx, “every product of labor is ... a use-value.” See Arjun Appadurai, *The Social Life of Things: Commodities in Cultural Perspective* (Cambridge University Press, 1988), 8. Szwedo describes commodification as an indication of a trend towards marketization of trade in a good or service. See Szwedo, *Cross-Border Water Trade*, 10.

<sup>59</sup> Peter H Gleick, *The World’s Water: The Biennial Report on Freshwater Resources 2002-2003*, vol. 3 (Washington, D.C.: Island Press, 2002), 37.

<sup>60</sup> Gleick, 3:37.

<sup>61</sup> John Briscoe, “WATER AS AN ECONOMIC GOOD: THE IDEA AND WHAT IT MEANS IN PRACTICE L’EAU EN TANT QUE BIEN ECONOMIQUE: CONCEPTION ET MISE EN PRATIQUE” (World Congress of the International Commission on Irrigation and Drainage, Cairo: The World Bank, 1996), 5, <https://web.worldbank.org/archive/website00667/WEB/PDF/ICID16.PDF>.

<sup>62</sup> Briscoe, 4.

The term “commodification,” according to Oliver and Robison, refers to social exchanges that transform social goods into commodities.<sup>63</sup> They define “commodities” as economic goods that are subject to market forces and valued based on their ability to satisfy mainly physical needs.<sup>64</sup> Water is therefore “commodified” when it is exchanged as an economic good, valued according to its ability to fulfill physical needs, and subject to market forces. Scholars arguing against bulk water trade claim that the treatment of water as an economic good in the context of such trade results in the commodification of water, which they see as antithetical to water’s status as a human right and a unique and essential resource.<sup>65</sup>

### The Human Right to Water

Although the human right to water<sup>66</sup> is itself not formally enshrined in any legally binding international treaty or convention, the United Nations (UN) Committee on Economic, Social, and Cultural Rights (CESCR) adopted General Comment No. 15, which affirms the right to water, in 2003.<sup>67</sup> According to General Comment No. 15, the “human right to water is indispensable for leading a life in human dignity” and “is a prerequisite for the realization of other human rights.”<sup>68</sup> In 2010, the UN General Assembly (UNGA) explicitly recognized the human right to water and sanitation in Resolution 64/292. Specifically, Resolution 64/292 stipulates that clean drinking

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<sup>63</sup> Jeffrey R. Oliver and Lindon J. Robison, “Rationalizing Inconsistent Definitions of Commodification: A Social Exchange Perspective,” *Modern Economy* 08, no. 11 (2017): 1314–27, <https://doi.org/10.4236/me.2017.811088>.

<sup>64</sup> Oliver and Robison, 1315.

<sup>65</sup> Esther J. de Haan, “Chapter 15: Balancing Free Trade in Water and the Protection of Water Resources in GATT,” in *The Scarcity of Water: Emerging Legal and Policy Responses*, ed. Edward H.P. Brans et al., International Environmental Law and Policy Series (Kluwer Law International, 1997).

<sup>66</sup> I offer a more complete analysis of the conceptualization of water as a human right in significant binding and non-binding international texts in Chapter 2.2.

<sup>67</sup> United Nations, “The Human Right to Water and Sanitation,” International Decade for Action “Water for Life” 2005-2015., May 29, 2014, [https://www.un.org/waterforlifedecade/human\\_right\\_to\\_water.shtml](https://www.un.org/waterforlifedecade/human_right_to_water.shtml).

<sup>68</sup> Office of the High Commissioner for Human Rights, General Comment No. 15, The Right to Water (Arts. 11 and 12 of the Covenant), E/C.12/2002/11 (Jan. 20, 2003), 1, [hereinafter General Comment No.15] <https://www.refworld.org/pdfid/4538838d11.pdf>.

water and sanitation are essential to the realization of all human rights and calls upon states to provide “safe, clean, accessible, and affordable drinking water and sanitation for all.”<sup>69</sup>

Brown Weiss offers a comprehensive three-dimensional articulation of the human right to water that unifies the ideas of a human right to safe, potable water; a sufficient quantity of water; and equitable water access across geographic and generational boundaries under the umbrella concept of a human right to water.<sup>70</sup> Considering the all-inclusiveness of Brown Weiss’ definition, I employ it when referring to the human right to water in this work.<sup>71</sup>

### Water as a Unique and Essential Resource

Water is seen as a “unique and essential resource” due to the fact that water, specifically fresh water, is a finite resource that has no substitute, is necessary for all life on Earth, and is uniquely and complexly connected to the broader natural environment.<sup>72</sup> The invocation of the notion of water as a unique and essential resource is indicated by: comments regarding water’s essentialness for life; the complexity of ecological water systems; the importance of water sources to their surrounding environment and the well-being of water ecosystems; the lack of a substitute for water; the exhaustibility of water; and Earth’s limited freshwater resources. Going forward, I refer to the notions of the human right to water and water as unique and essential resource collectively as water’s “special status.”

### **Section 1.1.5: A Closer Look at the Normative Debate Regarding Bulk Water Trade**

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<sup>69</sup> United Nations, “The Human Right to Water and Sanitation.”

<sup>70</sup> Brown Weiss, *International Law for a Water-Scarce World*, 7:196–97.

<sup>71</sup> Brown Weiss, 7:191–208.

<sup>72</sup> Network of Asian River Basin Organizations et al., *IWRM Guidelines at River Basin Level: Part 1: Principles* (United Nations Educational, Scientific, and Cultural Organization, 2009), <https://unesdoc.unesco.org/ark:/48223/pf0000186417>; E. Schlager and C. Bauer, “Governing Water: Institutions, Property Rights, and Sustainability,” in *Treatise on Water Science* (Elsevier, 2011), 23–33, <https://doi.org/10.1016/B978-0-444-53199-5.00003-8>; Baumann, “Water Wars”; Gleick et al., “New Economy of Water: The Risks and Benefits of Globalization and Privatization of Fresh Water,” 11, 23.

Citing the purported negative environmental repercussions of bulk water removal and the necessity of water for human survival, Baumann argues against bulk water trade on the basis that it would diminish water's special status by treating it as an economic good and a commodity.<sup>73</sup> According to Baumann, "water is not just another product" but rather "an essential need."<sup>74</sup> E. Larson echoes this sentiment, arguing that "water is a unique, natural resources in both the variety and importance of the needs it satisfies."<sup>75</sup> Regarding the notion that water should not be treated as an economic good or commodity because access to it is a human right, the European Commission affirmed the idea that "water is not a commercial product" but rather "a public good and fundamental value" in 2014, thereby suggesting that the two conceptualizations of water are irreconcilable.<sup>76</sup> The Council of Canadians further supports this position and calls on the Canadian government to ban all bulk water exports based on the premise that water is a "human right, commons, and public trust."<sup>77</sup>

E. Larson also argues against bulk water trade on the grounds that it may be seen as transforming water into a "good" or "product" within the scope of international trade law under the GATT/WTO regime.<sup>78</sup> The GATT does not define what is meant by the term "product," as it is used in its provisions.<sup>79</sup> Regarding the definition of "goods" in the context of international trade,

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<sup>73</sup> Baumann, "Water Wars," 110–11.

<sup>74</sup> Baumann, 112, 131.

<sup>75</sup> E. Elise L Larson, "In Deep Water: A Common Law Solution to the Bulk Water Export Problem," *MINNESOTA LAW REVIEW* 96 (2011): 742.

<sup>76</sup> European Economic and Social Committee, "Opinion of the European Economic and Social Committee on the Communication from the Commission on the European Citizens' Initiative Water and Sanitation Are a Human Right! Water Is a Public Good, Not a Commodity!," *Official Journal of the European Union*, no. 12/33 (2015), <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52014IE2361&->.

<sup>77</sup> Emma Lui, "Debate on Bulk Water Exports to U.S. Resurfaces despite Recent Droughts in Canada," The Council of Canadians, 2015, <https://canadians.org/analysis/debate-bulk-water-exports-us-resurfaces-despite-recent-droughts-canada>.

<sup>78</sup> Larson, "In Deep Water: A Common Law Solution to the Bulk Water Export Problem," 740.

<sup>79</sup> Szwedo, *Cross-Border Water Trade*, 196.

one could turn to the North American Free Trade Agreement (NAFTA) for guidance. According to Article 201 of the NAFTA, goods are:

“...domestic products as these are understood in GATT 1994 or such goods as the Parties determine under the rules of origin applied in the normal course of trade, and includes originating goods of a Party...”<sup>80</sup>

Although scholars sometimes use the terms “good” and “product” interchangeably, as is seen in the works of Kellman and Gleick et al., the provisions of the GATT employ both terms in varying degrees and different contexts.<sup>81</sup> Szvedo identifies distinctions “drawn between [these terms] by the GATT draftsmen.”<sup>82</sup> Specifically, “product” is presented as encompassing a narrower meaning than “good” is. According to the decisions of both the WTO panel and Appellate Body (AB) in the case of *United States – Final Countervailing Duty Determination with respect to certain Softwood Lumber from Canada (US – Softwood Lumber IV)*,<sup>83</sup> the term “goods should be understood broadly” so as to include “material objects capable of being owned separately.”<sup>84</sup> For example, trees that are intended for felling but are still intact with the land could be considered goods because they are material objects that can be “owned separately from the land.”<sup>85</sup>

The application of the term “product” within the scope of the GATT, however, suggests “the necessity of production, i.e., processing.”<sup>86</sup> According to Szvedo, from the perspective of the GATT, the transformation of a natural resource “into a product occurs” upon “the investment of

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<sup>80</sup> North American Free Trade Agreement, Dec. 17, 1992, 32 I.L.M 289, (1993), [hereinafter NAFTA] [http://idatd.cepal.org/Normativas/TLCAN/Ingles/North\\_American\\_Free\\_Trade\\_Agreement-NAFTA.pdf](http://idatd.cepal.org/Normativas/TLCAN/Ingles/North_American_Free_Trade_Agreement-NAFTA.pdf).

<sup>81</sup> Elaine Kellman, “Water Trade and the WTO: An Analysis of Slovakia’s Constitutional Ban on the Export of Water,” *Manchester Journal of International Economic Law* 14, no. 2 (2017): 215–42; Gleick et al., “New Economy of Water: The Risks and Benefits of Globalization and Privatization of Fresh Water,” 15.

<sup>82</sup> Szvedo, *Cross-Border Water Trade*, 91.

<sup>83</sup> Panel Report, *United States — Final Countervailing Duty Termination with respect to certain Softwood Lumber from Canada*, para. 7.3, WTO Doc. WT/DS257/R (August 29, 2003), [hereinafter United States — Softwood Lumber IV]. <https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=Q:/WT/DS/257R-00.pdf&Open=True>.

<sup>84</sup> Szvedo, *Cross-Border Water Trade*, 91.

<sup>85</sup> Szvedo, 92.

<sup>86</sup> Szvedo, 91.

either work or mechanical operation” that alters the resource from “its natural state.”<sup>87</sup> In the context of water, therefore, water resources transform into products through processes such as “packaging, filtration, testing, or bottling.”<sup>88</sup> Although water removed from its natural source and placed “in a pipeline or on a tanker” for the purposes of bulk water trade is a good/commodity, such removal and placement are not enough to transform it into a product. Szwedlo likens this state of water to oil that is taken from the ground and simply positioned “in an oil pipeline or on a tanker.”<sup>89</sup> Although qualifying as a good/commodity, such unaltered oil falls short of transforming into a “product.”<sup>90</sup> Nevertheless, according to Szwedlo, the designation of water as *either a “good” or “product”* triggers “the application of free-trade agreements,” including the GATT.<sup>91</sup> Therefore, the additional transformation of water into a product *is not required* for the application of the GATT to relations that treat water as a good.

Following this same logic, Baumann, E. Larson, Gleick et al., and others argue that the perceived treatment of water as an economic good in the context of bulk water trade could potentially trigger the application of GATT/WTO rules to water. According to the aforementioned authors, the application of such rules is highly problematic because they are incapable of properly accounting for and protecting water’s special status.<sup>92</sup> They further contend that, rather than being

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<sup>87</sup> Szwedlo, 196.

<sup>88</sup> Szwedlo, 196.

<sup>89</sup> Szwedlo, 196.

<sup>90</sup> Szwedlo, 196.

<sup>91</sup> Szwedlo, 196; Peter Bowal, “Canadian Water: Constitution, Policy, and Trade,” *Michigan State Law Review* 2006 (2006): 1141; Fitzgerald Temmerman, *Bulk Fresh Water Resources and the GATT: Bulk Fresh Water, Irrigation Subsidies and Virtual Water, Trade in Water Under International Law* (Edward Elgar Publishing, 2017), 27, [https://www.elgaronline.com/view/9781785369124/12\\_chapter1.xhtml](https://www.elgaronline.com/view/9781785369124/12_chapter1.xhtml).

<sup>92</sup> Baumann, “Water Wars,” 115, 123; E. Larson, “In Deep Water: A Common Law Solution to the Bulk Water Export Problem,” 746–48.

subject to market forces and the provisions of international trade laws that lack appropriate environmental protections, national freshwater resources should be managed as a public trust.<sup>93</sup>

Brown Weiss and others have also argued that bulk water trade exports should be avoided because they trigger the application of GATT/WTO law that would diminish a country's sovereign control over its essential national freshwater resources.<sup>94</sup> Specifically, the application of GATT/WTO provisions to water in the context of bulk water trade would force countries engaged in such trade to manage national water resources according to principles of international trade law rather than doing whatever is needed to satisfy domestic water needs.<sup>95</sup>

While acknowledging that WTO member states must ensure that relevant policies related to natural resources “are enacted in accordance [with] WTO law,” Szwedo claims that “states do not forgo their sovereignty over natural resources,” which include domestic water resources, “by joining the WTO.”<sup>96</sup> Temmerman argues in favor of the application of GATT/WTO law to the regulation of global water resources, positing that “the GATT framework might be the most suitable legal framework for effectively redistributing freshwater resources internationally.”<sup>97</sup> According to Temmerman, although prohibiting bulk water trade may help countries maintain their “permanent sovereignty over freshwater resources,” it “would not help forward the realization of the human right to water on the international level.”<sup>98</sup>

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<sup>93</sup> Baumann, “Water Wars,” 126–31; E. Larson, “In Deep Water: A Common Law Solution to the Bulk Water Export Problem,” 741, 763–67.

<sup>94</sup> Brown Weiss, *International Law for a Water-Scarce World*, 7:266–67.

<sup>95</sup> Canadian Water Resources Association, “Canada’s Freshwater: A Commodity for Export, A Resource for Conservation? Questions for a Strategy for Sustainability,” INQUIRIES For a Sustainable Future (Learning for a Sustainable Future), accessed January 30, 2021, <http://lsf-1st.ca/media/water.en.pdf?phpMyAdmin=27c4ca48e56t67ceba5e>.

<sup>96</sup> Szwedo, *Cross-Border Water Trade*, 216.

<sup>97</sup> Temmerman, *Bulk Fresh Water Resources and the GATT*, 2017, 58.

<sup>98</sup> Fitzgerald Temmerman, *Bulk Fresh Water Resources and the GATT: Bulk Fresh Water, Irrigation Subsidies and Virtual Water, Trade in Water Under International Law* (Edward Elgar Publishing, 2017), 63, [https://www.elgaronline.com/view/9781785369124/12\\_chapter1.xhtml](https://www.elgaronline.com/view/9781785369124/12_chapter1.xhtml).



Other proponents of bulk water trade argue that trading water as an economic good or commodity, governing exchanges of water using international trade law, and subjecting the movement of and access to water to market forces may be an efficient means of managing scarce water resources.<sup>99</sup> This argument is presented by Güler, R. Larson, Szvedo, and others who articulate the advantages of exporting bulk water and establishing global water markets under the auspices of international trade law as a means of protecting Earth's limited freshwater resources while more equitably and sustainably meeting global water needs.<sup>100</sup>

It should be noted, however, that there remains a deal of uncertainty regarding whether the perceived treatment of water as an economic good in the context of bulk water trade does in fact incite the transformation of water into a “good” or “product” under the GATT/WTO.<sup>101</sup> Some

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<sup>99</sup> International Conference on Water and the Environment (ICWE), “The Dublin Statement and Report of the Conference,” in *International Conference on Water and the Environment: Development Issues for the 21st Century* (Geneva, Switzerland: ICWR Secretariat, World Meteorological Organization, 1992). [hereinafter Dublin Principles] <https://www.ircwash.org/sites/default/files/71-ICWE92-9739.pdf>; Anderson and Landry, “Exporting Water to the World,” n.d., 1–2; Brown Weiss, *International Law for a Water-Scarce World*, 7:243–68; Gleick et al., “New Economy of Water: The Risks and Benefits of Globalization and Privatization of Fresh Water,” 1, 6, 11–12; Gleick, “Global Freshwater Resources,” November 28, 2003; Szvedo, *Cross-Border Water Trade*, 84–86.

<sup>100</sup> Güler, “Bulk Water Transfer,” 5–7, 10; Rhett Larson et al., *The Case of Canadian Bulk Water Exports*, 2015, <http://www.deslibris.ca/ID/247839>; Szvedo, *Cross-Border Water Trade*, 1–3.

<sup>101</sup> The dispute regarding the treatment of unbottled, untreated water as a “good” or “product” under the GATT is comparable to the historic disagreement regarding the status of another kind of unaltered natural resource: live, unfelled trees intended for trade between Canada and the United States. According to Canada's response to questions presented by the WTO Dispute Resolution Panel convened to determine the status of unfelled trees as goods under the GATT, the ordinary definition of a “good” is the same as that of a “product.” Specifically, the Canadian representative posited that a good is understood within the scope of the WTO regime to constitute “tangible or movable personal property other than money,” especially “articles or items of merchandise (goods or services).” Such an understanding would leave live, unfelled trees—and indeed all natural resources—outside the scope of the term “good.” The U.S. representative to the case disagreed with this limited understanding, claiming that it “contradicted . . . ordinary dictionary definitions and Canada's own laws.” See Parties Responses to Questions – First Meeting of the Panel, *United States – Preliminary Determinations with Respect to Certain Softwood Lumber from Canada*, WTO Doc. WT/DS236/R (May 21, 2002), available at [https://docs.wto.org/dol2fe/Pages/FE\\_Search/FE\\_S\\_S006.aspx?DataSource=Cat&query=@Symbol=WT/DS236/R&Language=English&Context=ScriptedSearches&languageUIChanged=true](https://docs.wto.org/dol2fe/Pages/FE_Search/FE_S_S006.aspx?DataSource=Cat&query=@Symbol=WT/DS236/R&Language=English&Context=ScriptedSearches&languageUIChanged=true). Contending with the aforementioned debate from the position of water as a natural resource, it should be noted that, according to precedents set in cases such as the one defined above, a natural resource can be considered a “good” or “product” in the context of the WTO, if it meets the following requirements: 1) it is listed as a good “in the Member States' Schedules of Concessions on goods;” 2) it is tradable and has monetary value; and 3) it reaches “a level of processing specified by the [Harmonized Schedule] Nomenclature in relation to specific natural-resource-based good.” See Melaku Desta, “To What Extent Are WTO Rules Relevant to Trade in Natural Resources?,” World Trade Organization, accessed

scholars, such as Anderson and Landry, Gerbasi, and Temmerman, hold that water becomes a tradable product when it is removed from its “natural state” and placed in a pipeline or tanker” and is thereby subject to the provisions of international trade regimes.<sup>102</sup> Others, including Brown Weiss et al., claim that water does not necessarily become “a tradable good subject to GATT rules” by virtue of being “removed in bulk and lifted out of its natural state.”<sup>103</sup>

This work does not attempt to answer the question of whether water traded in the context of bulk water trade ought to be regarded as a “good” or a “product” subject to GATT/WTO law. Rather, building off of the above-discussed literary foundation, this work seeks to move the conversation regarding the implications of bulk water trade on water’s status out of the theoretical realm into the real world. It accomplishes this by recognizing that there are in fact actual instances of bulk water trade that can offer insights as to how water is treated within the context of such trade by the very parties engaged in it. As I will demonstrate in this work, these insights have

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December 13, 2020,

[https://www.wto.org/english/res\\_e/publications\\_e/wtr10\\_forum\\_e/wtr10\\_dest\\_a\\_e.htm](https://www.wto.org/english/res_e/publications_e/wtr10_forum_e/wtr10_dest_a_e.htm). Furthermore, although there is a code under the Harmonized Tariff Schedule (HTS), HTS Code 2201, that refers to certain water-related objects, the HTS “is not a legal instrument determining what is the object of commercial trade” and therefore ought not to be used when identifying whether something is a “good” or “product.” Rather, it only informs the application of “a particular tariff heading” to something once it is classified as a good or project. *See*: Szwed, *Cross-Border Water Trade*, 94–95. Furthermore, HTS Code 2201 applies to “waters, including natural or artificial mineral waters and aerated waters, not containing added sugar or other sweetening matter nor flavored; ice and snow.” *See*: “HS Code 2201 | Harmonized System Code Of WATERS, INCLUDING NATURAL OR ARTIFICIAL MINERAL WATERS AND AERATED WATERS, NOT CONTAINING ADDED SUGAR OR OTHER SWEETENING MATTER NOR FLAVOURED; ICE AND SNOW,” accessed September 19, 2020, <https://www.cybex.in/hs-codes/waters-natural-artificial-mineral-aerated-heading-2201.aspx>. Considering the particular phrasing of the code, as well as the lack of applicable precedent regarding its application to bulk, untreated, unbottled fresh water, there is still a question as to whether the code would apply to such water. *See*: Gleick et al., “New Economy of Water: The Risks and Benefits of Globalization and Privatization of Fresh Water,” 15–16; Larson, “In Deep Water: A Common Law Solution to the Bulk Water Export Problem,” 739–67.

<sup>102</sup> Terry Anderson and Clay Landry, “Exporting Water to the World,” *Journal of Contemporary Water Research and Education* 118, no. 1 (May 31, 2011): 61, <https://opensiuc.lib.siu.edu/jewre/vol118/iss1/8>; Jennifer C Gerbasi, “The Next Privatization of Public Assets: Domestic and Trade Implication Related to Water Right and Land Acquisition,” 2004, 26; Temmerman, *Bulk Fresh Water Resources and the GATT*, 2017, 62.

<sup>103</sup> Edith Brown Weiss, Laurence Boisson de Chazournes, and Nathalie Bernasconi-Osterwalder, *Fresh Water and International Economic Law*, First (Oxford University Press, 2005), 122; Temmerman, *Bulk Fresh Water Resources and the GATT*, 2017, 62.

implications for the normative debate regarding the treatment of water in the context of bulk water trade, even though I do not posit a formal argument in favor of either side of the debate.

In examining case studies of actual instances of bulk water trade in this work, I sought to answer the following questions: 1) how do parties to international bulk water trade relations approach water as the object of such trade and 2) how can past and present instances of bulk water trade inform the development of a framework for the regulation of such trade at the international level?

### *Chapter 1.2: Methods and Materials*

To answer the questions presented above, I employed a four-step methodology. I summarize the steps of this methodology below before addressing each step in more detail:

- Step 1: Collect and compile actual instances of bulk water trade through the creation of the International Bulk Water Trade Bank (IBWTB);
- Step 2: Create a typology of different approaches to water trade represented by the instances reviewed in the creation of the IBWTB;
- Step 3: Identify and examine various conceptualization, or “definitions,” of water articulated in international law and other significant texts relating to the use and management of water resources; and
- Step 4: Analyze select case studies of international bulk water trade using the typology of approaches created in Step 2

Considering that one of the main goals of this work was to determine how actual instances of bulk water trade could inform the possible creation of an international framework for such trade, the first step in my research was to find and identify such instances. In the course of this initial search, I noted the lack of a centrally aggregated collection of instances that would have been an extremely valuable resource in my research. As such, I decided to create the International Bulk Water Trade Bank (IBWTB) as part of my efforts to find and identify instances. The IBWTB (see Annex 1) now serves as the first systematic collection of executed instances of international bulk water trade relations. I introduce the IBWTB in Chapter 2.1, at which point I discuss the precise process, methodology, and criteria used to create it.

In Step 2, I collected additional information regarding the instances included in the IBWTB to produce a typology of various approaches to bulk water trade. This typology, which is first presented in Chapter 2.1 and elaborated on in Chapter 2.3, consists of three approaches to bulk water trade and one proxy approach to water trade. By “approaches,” I am referring to the distinct ways parties to bulk water trade relations treat water in the context of such trade. I call these approaches “philosophies” and detail their parameters in Chapters 2.1 and 2.3. The creation of such a typology underscored differences in the ways countries engage in bulk water trade and treat water as the object of such trade relations. These differences offer varying perspectives regarding how countries execute bulk water trades given the current lack of an international framework governing such relations.

In Chapter 1.1, I discussed the role played by the question of whether treating water as an economic good undermines the preservation of water’s special status in the normative debate concerning bulk water trade. The relevance of this question in determining the potential development of future bulk water trade relations validates the importance of taking it into account when discussing the effectuation of a framework for such relations. Recognizing this, I identified ways in which water is conceptualized, or “defined,” across a spectrum of legal regimes in Step 3. To do so, I reviewed primary and subsidiary sources of international law and other significant texts related to the use and management of water resources (i.e., UN resolutions and declarations, conventions, agreements, decisions from international courts and arbitrations, etc.).<sup>104</sup> I discuss this review and the insights I drew from it in Chapter 2.2.

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<sup>104</sup> Specific examples of materials that will be reviewed are the 1966 Helsinki Rules on the Uses of the Waters of International Rivers, the 2004 Berlin Rules on Water Resources, the 1992 Dublin Statement on Water and Sustainable Development, 1997 United Nations Convention on the Law of the Non-Navigational Uses of International Watercourses, and the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal.

The materials I relied on for this review are all publicly available documents selected based on their relevance to the use and management of water resources. I identified materials to analyze based on my background knowledge of relevant water-related texts and by examining citations and references included in scholarly works; international water resource workshop outcome documents and briefs; international resolutions, declarations, agreements, and judicial and arbitration decisions; and reports compiled by internationally recognized water-oriented organizations such as the World Water Council, International Water Association, International Water Management Institute, UN Environment Programme, and UN Water.

In Step 4, I reviewed case studies of bulk water trade representative of the different water trade philosophies included in the typology produced in Step 2. In selecting case studies, I relied on my categorization of instances into different philosophies. I chose one case study to analyze per bulk water trade philosophy and explain my case study selection process in more detail in the next chapter. I present my case study analyses in Chapter 2.3, wherein I also discuss case studies of a proxy approach to water trade. My reasoning for including this proxy approach, which I identified in the course of examining prospective bulk water trade instances, is also discussed in Chapter 2.3.

The purpose of my case study analyses is to examine how water is treated in the context of various approaches to bulk water trade, classified according to the different water trade philosophies they represent. Furthermore, I rely on this examination to determine what insights, if any, actual instances of bulk water trade could offer regarding the articulation of a framework for bulk water trade at the international level. The materials I reviewed in Step 4 include water trade treaties and/or agreements associated with a particular case study, relevant domestic water laws,

scholarly works that discuss the selected case studies, and news and media articles reporting on water trade relations represented by the case studies.

### *Chapter 1.3: Selection of Case Studies*

As I mentioned in Chapter 1.2, the fourth step of my analysis involved the examination of several case studies. I relied on the IBWTB and the information I collected in the process of creating it to identify a diverse selection of case studies that represented each category included in my typology of water trade philosophies. In total, this typology includes three philosophies representative of distinct bulk water trade approaches and one proxy philosophy that represents a “proxy” approach to water trade. This proxy approach, which encompasses certain elements of water trade, does not fit the criteria to be considered bulk water trade, as I have defined it in this work. Specifically, this approach represents trade relations wherein parties externally obtain and transfer water but treat water-related objects/services—rather than the actual water being transferred—as the objects of valuation and appraisal. I introduce these philosophies in Chapter 2.1 and expand upon them in Chapter 2.3.

For my case study analyses, I wanted to review cases that highlighted critical aspects of each of the three bulk water trade philosophies, as well as of fourth philosophy encompassing the proxy approach described above, included in my typology. To accomplish this, I selected the water trade relations between 1) Singapore and the state of Johor, Malaysia; 2) Barcelona, Spain and France; 3) Jordan and Syria; 4) South Africa and Lesotho; and 5) the commune of Gorizia, Italy and Slovenia<sup>105</sup> as case studies.<sup>106</sup> I selected the second and third cases as being emblematic

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<sup>105</sup> At the time the treaty establishing the water relations in question was signed, Slovenia was part of the Socialist Federal Republic of Yugoslavia; however, I refer to this trade, which, based on a review of available information, appears to continue into the present, as involving Slovenia. *See*: Szwedo, *Cross-Border Water Trade*, 138; U.S. Department of State, Office of the Historian, “Milestones: 1989–1992 - Office of the Historian,” Government, Office of the Historian, accessed April 17, 2021, <https://history.state.gov/milestones/1989-1992/breakup-yugoslavia>.

<sup>106</sup> Regarding the order of parties named in the selected case studies, the water-importing party is listed first.

of the three classifications of bulk water trade philosophies included in my typology. I selected the fourth and fifth cases to represent the proxy philosophy I identified. The first case, that of the water trade between Singapore and Johor, included elements of both the first philosophy (Philosophy 1) defined by my typology and the proxy philosophy. Therefore, I analyzed this case as an example of both, distinguishing between which aspects of the case related to which philosophy.

I chose the aforementioned cases based on the two considerations for case study selection presented by Seawright et al.: “within-case characteristics” and “pragmatic, logistical issues.”<sup>107</sup> Regarding the former, I chose my case studies based on the approaches to water trade represented by each case’s specific characteristics. As I mentioned above, the first three case studies presented represent the three categories of bulk water trade philosophies identified in my typology. I identified these cases by reviewing the typology classifications for instances included in the IBWTB and then selecting cases from within each classification.

I also selected cases representing the proxy philosophy based on their “within-case characteristics;”<sup>108</sup> however, cases emblematic of the proxy philosophy, with the exception of the trade between Singapore and Johor, were not included in the IBWTB. Instead, I identified these cases in the process of creating the IBWTB. Specifically, I had initially included each of the selected proxy philosophy case studies as potential examples of bulk water trade. In applying the criteria for inclusion in the IBWTB<sup>109</sup> to these cases, however, I collected information regarding their “within-case characteristics” that led me to ultimately exclude them and instead classify them as the proxy philosophy.<sup>110</sup>

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<sup>107</sup> Jason Seawright et al., “Case Selection Techniques in Case Study Research: A Menu of Qualitative and Quantitative Options,” in *Case Studies*, by Malcolm Tight (1 Oliver’s Yard, 55 City Road, London EC1Y 1SP United Kingdom: SAGE Publications Ltd, 2014), II213–II213, <https://doi.org/10.4135/9781473915480.n31>.

<sup>108</sup> Seawright et al., 296.

<sup>109</sup> The criteria for inclusions are explained and discussed in Chapter 2.1.

<sup>110</sup> Seawright et al., “Case Selection Techniques in Case Study Research,” 296.

I also relied on Seawright et al.’s consideration of “within-case characteristics” to select a *diverse* range of proxy philosophy case studies.<sup>111</sup> Each of the three proxy philosophy case studies analyzed are characterized by the proxy valuation and appraisal of a different water-related object/service: the trade between Singapore and Johor involves the valuation and appraisal of land; the trade between South Africa and Lesotho involves the valuation and appraisal of land and making water available in a specific place; and the trade between Gorizia and Slovenia involves the valuation and appraisal of water distribution services.<sup>112</sup>

I wanted to include a diverse selection of proxy philosophy cases in order to provide more meaningful insights regarding how interested parties could and do apply the proxy philosophy in their export and import of water resources.<sup>113</sup> The diversity of these cases emphasizes the range of water-related objects/services that could be valued or appraised in place of the water resources actually being transferred between parties. The specific characteristics of all the cases studies I selected are discussed in Chapter 2.3.

Upon identifying a pool of potential case studies that represented the various categories of my water trade typology, I applied Seawright et al.’s second consideration, that of “pragmatic, logistical issues,” to further distill which cases to review from within each category.<sup>114</sup> Specifically, I chose instances of bulk water trade and examples of the proxy philosophy to serve as case studies based on the amount and quality of relevant information I had available. Therefore,

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<sup>111</sup> Seawright et al., 300.

<sup>112</sup> Agreement as the Certain Water Rights in Johore between His Highness the Sultan and Sovereign Ruler of the State and Territories of Johore and the Municipal Commissioners of the Town of Singapore, Dec, 5, 1927, *Administration Report of the Singapore Municipality for the Year 1927*: 1-10 [hereinafter the 1927 Agreement]; Treaty on the Lesotho Highlands Water Project between the Government of the Kingdom of Lesotho and the Government of the Republic of South Africa, Oct. 24, 1986, *Treaties Concerning the Non-Navigational Uses of International Watercourses: Africa*, FAO Legislative Study no. 61 (1997): Section 30, [hereinafter the 1986 Treaty] <http://www.fao.org/3/w7414b/w7414b0w.htm>; Treaty of Peace with Italy, Feb. 10, 1947, 49 U.N.T.S. 3, <https://treaties.un.org/doc/publication/unts/volume%2049/v49.pdf>.

<sup>113</sup> Seawright et al., “Case Selection Techniques in Case Study Research,” 300.

<sup>114</sup> Seawright et al., 296.



my selection of cases reflects the cases within each typology category for which I had the most information to analyze. Having access to a comparatively larger body of information for these cases enabled me to perform a more comprehensive and effective analysis than I would have otherwise been able to. Significantly, the first and third aforementioned cases of bulk water trade represent two of the five bulk water trade instances for which I was able to access the associated trade agreement.

Access to such agreements was extremely valuable because it allowed for an assessment of particular agreement provisions relating both generally to the terms governing the trade of water and specifically to the treatment of water in the context of bulk water trade. As such, these agreements served as important sources of insights regarding how parties engaged in bulk water trade approach water as the object of such trade relations. I also had access to the agreements governing the three proxy philosophy case studies I analyzed. As with the cases of bulk water trade, these agreements served as vital resources in determining how the terms regarding the transfer of water from one party to another were articulated.

Unfortunately, and despite my best efforts, I could not obtain access to an agreement for at least one instance representative of every philosophy. Specifically, I was unable to obtain an agreement for any instances classified as representing the second philosophy in my typology (Philosophy 2). I reviewed the bulk water trade between Barcelona, Spain and France as my Philosophy 2<sup>115</sup> case study because it was the instance from within the Philosophy 2 category for which I had the greatest amount of reliable and relevant information.

By applying these considerations, I was able to select case studies that allowed me to present an in-depth analysis of each of the diverse water trade philosophies I identified. It also

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<sup>115</sup> I clarify what is meant by Philosophy 2 in Chapters 2.1 and 2.3.

allowed me to analyze cases for which I had the most amount of information, therefore enabling me to draw the most reliable and complete conclusions regarding the treatment of water in the context of bulk and proxy water trade relations.

#### *Chapter 1.4: Hypothesis and Applicable Theory*

Two hypotheses serve as the points of departure for this work, each relating to one of the research questions presented in Chapter 1.1.

##### **Section 1.4.1: Research Question One and Associated Hypothesis**

As I discussed in Chapter 1.1, a critical consideration at the crux of the normative debate regarding bulk water trade is whether such trade *should* occur due to its potential implications on water's special status. Opponents of bulk water trade argue against it on the grounds that such trade results in the treatment of water as an economic good, transforming water into a commodity and, *ipso facto*, threatening the preservation of water's special status.<sup>116</sup> In this work, I do not present a side for or against the implementation of bulk water trade relations. Therefore, I do not directly contend with the aforementioned normative debate. Instead, I analyze the practices of parties engaged in bulk water trade in an attempt to elucidate and verify claims regarding the implications of such trade on the status of water. Although this is a more descriptive research approach, I hypothesize that, *the treatment of water in the context of bulk water trade is much more nuanced than the arguments presented by bulk water trade's detractors suggest.*

This hypothesis is based on the accepted reality that the international and domestic management of water resources has historically contended with varying dimensions of water. In her analysis of twenty-first century transboundary water treaties, Brown Weiss finds that states

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<sup>116</sup> Baumann, "Water Wars," 112, 131; Larson, "In Deep Water: A Common Law Solution to the Bulk Water Export Problem," 742; de Haan, "Chapter 15: Balancing Free Trade in Water and the Protection of Water Resources in GATT," 247; Szwedo, *Cross-Border Water Trade*, 26–27.

have employed an “integrated approach to water management to address ecosystem and pollution issues together with issues of water use allocation and economic cooperation.”<sup>117</sup> Although such approaches do not recognize water as an economic good, *per se*, they do demonstrate a degree of compatibility between recognizing water’s social and environmental dimensions and its importance in producing economic value.

Furthermore, according to the UN, Integrated Water Resources Management (IWRM) is now internationally recognized as “the way forward for efficient, equitable and sustainable development and management of the world’s limited water resources and for coping with conflicting demands.”<sup>118</sup> IWRM, as defined by the Global Water Partnership, enables water policy makers “to maximize economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems and the environment.”<sup>119</sup> The implementation of IWRM as a policy for water use and management “is based on the understanding that water” is “an integral component of the ecosystem, a natural resource, and a social and economic good.”<sup>120</sup>

According to the UN’s 2018 review of global IWRM implementation, “the vast majority...of countries have” at least “laid the foundations for” IWRM, and about 20 percent of countries internationally are “generally achieving their” IWRM policy objectives.<sup>121</sup> The active implementation of IWRM, which integrates water’s social, environmental, and economic dimensions into the management of water resources perceived to be both limited and essential, further supports the notion that treating water as an economic good does not necessitate the

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<sup>117</sup> Brown Weiss, *International Law for a Water-Scarce World*, 7:89–90.

<sup>118</sup> United Nations, “Integrated Water Resources Management (IWRM),” International Decade for Action “Water for Life” 2005-2015. Focus Areas:, November 24, 2014, <https://www.un.org/waterforlifedecade/iwrm.shtml>.

<sup>119</sup> “What Is IWRM?,” Global Water Partnership, accessed March 18, 2021, <https://www.gwp.org/en/GWP-CEE/about/why/what-is-iwrm/>.

<sup>120</sup> “What Is IWRM?”

<sup>121</sup> “Progress on Integrated Water Resources Management – Global Baseline for SDG Indicator 6.5.1,” *UN-Water* (blog), accessed March 18, 2021, <https://www.unwater.org/publications/progress-on-integrated-water-resources-management-651/>.

rejection of its special status. Therefore, current water management principles and provisions buttress the hypothesis that the implications of managing water as an item of trade in and of itself in the context of bulk water trade may be more nuanced than the arguments of bulk water trade's opponents suggest.<sup>122</sup>

#### **Section 1.4.2: Research Question Two and Associated Hypothesis**

In addressing my second research question, I hypothesize that *the practices of parties to bulk water trade that emerge in the absence of a clear framework governing such trade offer discernable insights that can inform the actual establishment of such a framework*. This hypothesis is based on prior evidence of the value of state practice in the formulation of both customary and treaty-based international law.

The establishment of customary international law requires evidence of *opinio juris*, or a sense of legal obligation, and state practice.<sup>123</sup> An example of a widely recognized canon that fulfills both necessary conditions and is therefore deemed to be customary international law is the granting of immunity to visiting heads of state. In order to prove the element of state practice to the degree necessary for establishing customary international law, it must be determined that a practice is both extensive and virtually uniform.<sup>124</sup> The importance of state practice in establishing eventual customary international law and the conditions needed to demonstrate its existence have been articulated in several judicial decisions of international significance, including the *North Sea Continental Shelf Cases (Federal Republic of Germany v. Denmark; Federal Republic of Germany*

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<sup>122</sup> Network of Asian River Basin Organizations et al., *IWRM Guidelines at River Basin Level: Part 1: Principles*, iii.

<sup>123</sup> André da Rocha Rocha Ferreira et al., "Formation and Evidence of Customary International Law," *UFRGS Model United Nations Journal* 1 (2013): 182–201.

<sup>124</sup> "Customary International Law," LII / Legal Information Institute, accessed March 18, 2021, [https://www.law.cornell.edu/wex/customary\\_international\\_law](https://www.law.cornell.edu/wex/customary_international_law).

*v. Netherlands*),<sup>125</sup> *Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion*,<sup>126</sup> and the *Asylum Case (Colombia v. Peru)*.<sup>127</sup> The requirement of state practice is also codified in Article 38(b) of the Statute of the International Court of Justice (ICJ).<sup>128</sup>

The goal of this work, which examines state practice in the context of bulk water trade, is not to confirm the existence of state practice as is required to establish customary international law. Instead, I rely on the value of state practice in the creation of customary international law as a basis for the theory that state practice developed in the initial absence of clearly pronounced frameworks regulating inter-state relations can offer insights regarding the eventual formation of such frameworks.

State practice is also an important element in informing the development of treaty-based international law. Specifically, practices subscribed to by states have sometimes been integrated into the formulation of statutes codifying these practices as law. An example of this is the incorporation of the principle of an exclusive maritime zone under the sovereign control of a coastal state in the UN Convention on the Law of the Sea (UNCLOS).<sup>129</sup>

The signing and adoption of UNLCOS in 1982 resulted in the codification of the notion of “an area beyond and adjacent to the territorial sea” that was under the jurisdiction of the associated adjacent coastal state.<sup>130</sup> The rights and provisions pertaining to such an area, commonly referred

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<sup>125</sup> *North Sea Continental Shelf (F.R.G. v. Den.; F.R.G. v. Neth.)*, Judgement, 1969 I.C.J. Rep. 3 (Feb. 20), <https://www.icj-cij.org/public/files/case-related/51/051-19690220-JUD-01-00-EN.pdf>.

<sup>126</sup> *Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion*, 1996 I.C.J. Rep. 226 (July 8), <https://www.icj-cij.org/public/files/case-related/95/095-19960708-ADV-01-00-EN.pdf>.

<sup>127</sup> *Asylum Case (Colom. v. Peru)*, Judgment, 1950 I.C. J. Rep. 266 (Nov. 20), <https://www.icj-cij.org/public/files/case-related/7/007-19501120-JUD-01-00-EN.pdf>.

<sup>128</sup> Arthur Mark Weisburd, “The International Court of Justice and the Concept of State Practice,” *SSRN Electronic Journal*, 2008, <https://doi.org/10.2139/ssrn.1282684>.

<sup>129</sup> *Convention on the Law of the Sea*, Dec. 10, 1982, 1833 U.N.T.S. 397, [hereinafter UNCLOS] <https://treaties.un.org/doc/Publication/UNTS/Volume%201833/volume-1833-A-31363-English.pdf>.

<sup>130</sup> UNCLOS, art. 55.

to today as an exclusive economic zone (EEZ),<sup>131</sup> are outlined in Part V of UNCLOS;<sup>132</sup> however, the idea, upon which the notion of the EEZ is based, was first introduced as and practiced according to the concept of a “patrimonial sea.”<sup>133</sup> According to Nelson, a patrimonial sea refers to “an economic zone” spanning no more than “200 miles...from the base line of the territorial sea,” within which any state can exercise its “freedom of navigation and overflight” but only the associated “coastal State will have an exclusive right to all resources.”<sup>134</sup> The “genesis of the concept” of the patrimonial sea was a set of proclamations regarding U.S. control of coastal areas and resources issued by U.S. president Harry S. Truman in 1945.<sup>135</sup> In the years that followed, several Latin and South American states established comparable legal principles by decree, constitutional amendment, and other means.<sup>136</sup>

In 1972, the concept of the patrimonial sea was eventually “redub[ed]” as the “exclusive economic zone” “by the Kenyan delegation to the Asian African Legislative Consultative Committee.”<sup>137</sup> The concept of an EEZ eventually informed the formation of and was ultimately incorporated into an internationally recognized legal framework for the governance of the world’s oceans and seas, UNCLOS.<sup>138</sup> Such international legal history demonstrates how state practices that emerged in the absence of an established international legal framework can eventually come to inform the development of such a framework. Following this logic, the practices of states

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<sup>131</sup> According to UNCLOS, an EEZ is a 200 nautical mile zone that extends from the baseline of a coastal state and within which that coastal state has certain sovereign rights and can exercise jurisdiction in regard to, *inter alia*, artificial islands, research, and the marine environment. *See*: UNCLOS, arts. 56 and 57.

<sup>132</sup> UNCLOS, Part V.

<sup>133</sup> James E. Bailey III, “The Exclusive Economic Zone: Its Development and Future in International and Domestic Law,” *Louisiana Law Review*, Symposium: Law of the Sea, 45, no. 6 (July 1985): 1269.

<sup>134</sup> L. D. M. Nelson, “The Patrimonial Sea,” *The International and Comparative Law Quarterly* 22, no. 4 (1973): 668–86.

<sup>135</sup> Nelson, 699.

<sup>136</sup> Nelson, 699–671.

<sup>137</sup> Bailey III, “The Exclusive Economic Zone: Its Development and Future in International and Domestic Law,” 1269.

<sup>138</sup> UNCLOS, arts. 43-53.

engaged in bulk water trade could therefore also be expected to inform the creation of a framework for such trade by offering insights regarding how bulk water trades are executed in actuality.

## **Part 2: Analysis of Relevant Data and Materials**

### *Chapter 2.1: The International Bulk Water Trade Bank (IBWTB)*

#### **Section 2.1.1: Introducing the IBWTB**

In order to assess the implications of international bulk water trade on the status of water in the context of such relations and to improve the knowledge and information available regarding bulk water trade, I conducted a systematic search of past and present instances of trades involving the international export and/or import of fresh water in bulk. I refer to this amassment of instances as the IBWTB. Creating the IBWTB (see Annex 1) was an important step in the larger research process of this work, since it enabled me to generate a pool of instances from which to select case studies. It also serves as a significant contribution to the study of bulk water trade, considering that, prior to the IBWTB, there was no consolidated resource of executed international bulk water trade instances. By filling that gap, the IBWTB helps demonstrate the viability of such trade as a means of obtaining freshwater resources and provides state and non-state actors interested in bulk water trade with a repertoire of templates to build on and learn from.<sup>139</sup>

The creation of the IBWTB involved a three-step process. These steps are presented below and further laid out in Table 1:

- Step 1: Conduct a literature review to collect an initial list of *examples* of and *references* to potential bulk water trade;
- Step 2: Filter that initial list based on predetermined criteria to create a list of executed bulk water trade *instances*; and
- Step 3: Collect supplemental data regarding each instance included in the IBTWTB to allow for a more complete aggregation of information

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<sup>139</sup> Statute of the International Court of Justice, art. 38(1)(b), June 26, 1945, 59 Stat. 1055, 33 U.N.T.S. 933, <https://www.icj-cij.org/en/statute>.

Table 1

Steps	Criteria for Review and Inclusion
Step 1: Produce an Initial List of Examples/References Based on a Literature Review	1) Established relevance and recognition as an example of bulk water trade, however broadly defined, in background literature and in works cited by that literature addressing one or more of the following topics: a) water pricing; b) water commodification/marketization; c) water trade; and/or d) water transfer
Step 2: Filter the Initial List and Identify Instances	1) Successful execution 2) Transboundary trade 3) The valuation and/or appraisal of water 4) The exchange of untreated, unbottled water as an object of trade in its own right
Step 3: Collect Supplemental Data	1) Parties to the trade 2) Status of the trade 3) Date of initiation 4) Method of water transport 5) Approach to water trade 6) Source

### Section 2.1.2: Reviewing Literature and Producing the Initial List (Step 1)

In Step 1, I looked for references to the export or import of bulk water in background literature I surveyed on the topic. I started with works I reviewed as part of my literature review in Chapter 1.1. I then reviewed references cited by those works that addressed some element of bulk water trade (i.e., water pricing, water commodification/marketization, water trade, and/or water transfer). In so doing, I concentrated on literature that would likely contain examples of bulk water trade.

Although most of the literature I surveyed did not mention any examples of bulk water trade, casting a wider net reduced the probability of omitting a valuable source of examples. In collecting examples of bulk water trade, I primarily relied on the following works: volumes one, three, and eight of Peter Gleick's *The World's Water: The Biennial Report on Freshwater*, which serve as regularly updated reviews of water-related developments and challenges bearing



significant political, social, economic, and environmental implications; Piotr Szwedo's *Cross-Border Water Trade: Legal and Interdisciplinary Perspectives*, which is among the most recent and comprehensive pieces of literature published specifically on the topic of bulk water trade; public government websites of countries involved in bulk water trade; and various media and news articles discussing bulk water trade relations between international parties.<sup>140</sup>

During this search, I created an initial list of potential bulk water trade examples and references without prejudice towards the status of the trades or the actors involved. This initial list included over 60 references to relations that possibly fit my criteria to be considered "bulk water trade."

### **Section 2.1.3: Filtering the Initial List (Step 2)**

In Step 2, I filtered the initial list I compiled in Step 1 to remove bulk water trades that failed to meet any one of the following criteria: 1) represented a successfully executed trade; 2) involved international water trade; 3) involved the valuation and/or appraisal of water; and 4) designated untreated, unbottled fresh water as the object of trade relations. These criteria are also laid out in Table 1.

The first two criteria were chosen based on the objectives of the IBWTB. One of my primary goals in creating the IBWTB was to aggregate evidence demonstrating that international bulk water trade does in fact successfully occur. By demonstrating this reality, I hope to prompt discussions regarding how international bulk water trades are and can actually be regulated given existing or novel legal frameworks at the international level. Such discussions would help move the focus of conversations regarding bulk water trade away from currently prevalent deliberations

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<sup>140</sup> Peter H Gleick, *The World's Water: The Biennial Report on Freshwater Resources 1998-1999*, vol. 1, 9 vols. (Washington, D.C.: Island Press, 1998); Gleick, *The World's Water: The Biennial Report on Freshwater Resources 2002-2003*; Peter H Gleick, *The World's Water: The Biennial Report on Freshwater Resources, Volume 8*, vol. 8, 9 vols. (Washington, D.C.: Island Press, 2014); Szwedo, *Cross-Border Water Trade*.

concerning theoretical considerations and towards actually recognizing the existence and real-world implications of such trade.

I selected the third and fourth criteria based on my definition of bulk water trade. As I mention in Chapter 1.1, I define bulk water trade as the physical transport of untreated, unbottled water that is valued and appraised as the object of trade in its own right. Considering that some authors have more expansive or limited definitions of bulk water trade, which I briefly discuss in Chapter 1.1, I had to apply the elements of my definition of bulk water to my collection of bulk water trade instances. The three main elements of my definition are 1) the valuation and/or appraisal of water; 2) the designation of water as an object of the trade in its own right; and 3) the removal and transfer of water out of a water source in some capacity. Although all of the references I found satisfied the third element, there was some inconsistency regarding the application of the first two elements of my definition. As such, I used those two elements as additional criteria for filtering my list of references in order to exclude cases that fell outside the scope of my definition of bulk water trade.

I elaborate on the criteria introduced above in more detail shortly. Prior to discussing the criteria, however, it is important to note that, due to the lack of information available for many of the references to water trade I found, I selected to apply the criteria in an exclusionary manner. As such, rather than requiring that a certain reference to water trade meet each criterium in order to be included in the IBWTB, I included each reference as a default. I only removed a reference if the information I found demonstrated that a particular reference failed to meet one or more criterium. I chose inclusion as the default because the references to bulk water trade I found had already been labeled as either examples or potential examples of bulk water trade by a scholar writing about the reference. Therefore, these examples had already undergone some initial round

of “screening” to have received such a designation. Although I recognize that definitions of bulk water trade may vary slightly, I deferred to the analyses of other authors unless I could independently confirm that an example did or did not fit my specific criteria.

Upon applying the aforementioned four criteria, I ended up with a list of 42 instances of bulk water trade. These instances form the IBWTB. While I recognize that this list may not represent the entire universe of bulk water trades, it is the largest consolidated list of bulk water trades currently available.

#### Criterion 1: Successful Execution

The first criterium I applied in filtering my initial list of references/examples was determining whether a particular reference to water trade was in fact ever successfully executed. I excluded references to bulk water trades that ended in failed negotiations or that I could not confirm the successful execution of due to conflicting accounts. For example, I did not include the proposed bulk water trade between Turkey and Israel because of Turkey’s decision to abandon the project as retaliation against Israel for the killing of nine Turkish nationals in the Gaza Strip on May 31, 2010.<sup>141</sup> Another example I removed from the final IBWTB based on this criterium was the “nearly successful” export of bulk water by Resources Development Ltd., a water export company based in New Zealand, to Bahrain.<sup>142</sup> In 1971, Resources Development Ltd. was in the process completing its first bulk water order for shipment from New Zealand to Bahrain when a labor dispute broke out. The order was subsequently cancelled and water trade relations were never reestablished.<sup>143</sup>

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<sup>141</sup> Szwedo, *Cross-Border Water Trade*, 146–47.

<sup>142</sup> Anderson and Landry, “Exporting Water to the World,” n.d., 64.

<sup>143</sup> Anderson and Landry, 64.

I also excluded the example of water trade between Kuwait and Iran based on this criterium due to conflicting accounts regarding whether such trade was ever effectuated. In 2003, Kuwait's Energy Minister, Sheikh Ahmad Fahad al-Sabah, and his Iranian counterpart, Habibollah Bitaraf, signed a Memorandum of Understanding (MoU) wherein Iran agreed to export 900,000 cubic meters of water per day to Kuwait for thirty years at the price of \$1.50 to \$2.00 per liter.<sup>144</sup> The MoU, however, expired in December 2005 without any legislative action on the part of either country to execute its terms. In 2007, Javad Sa'dounzadeh, a member of the Iranian parliament, announced that water trade negotiations between Iran and Kuwait were restarting and that a general agreement between the two countries had been reached.<sup>145</sup> Nevertheless, there are still conflicting media and governmental accounts regarding whether the pipeline needed to transport the water was ever built and whether any water was ever actually transported to Kuwait from Iran.<sup>146</sup>

### Criterion 2: Transboundary Trade

Since the focus of this work is on the potential regulation of bulk water trade relations at the international level, I only wanted to include trades that crossed international boundaries in compiling the IBWTB. Therefore, the next criterium I used to filter my initial list in Step 2 was determining whether a particular reference/example involved international parties (i.e., parties that were not part of the same sovereign entity). For example, in 1997, fresh water was commercially delivered to the Greek island of Aegina using water bags. This event constituted the first ever

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<sup>144</sup> Hussein Amery, "Water Security for Kuwait: Assessing the Feasibility of Water Imports from Iran," *Int. J. of Hydrology Science and Technology* 2 (January 1, 2012): 292–305, <https://doi.org/10.1504/IJHST.2012.049165>.

<sup>145</sup> Amery, 8.

<sup>146</sup> According to Amery and the actual sale of water from Iran to Kuwait never occurred. *See*: Amery, 7. The Iranian government also rejects claims that it exports water to Kuwait. IFP Editorial Staff, "Iran Rejects Rumours of Exporting Water to Kuwait," *Iran Front Page* (blog), June 28, 2018, <https://ifpnews.com/iran-rejects-rumours-of-exporting-water-to-kuwait>. Such accounts contradict media reports of Iranian water exports to Kuwait taking place amid the 2018 drought in Iran. *See*: "Iran Regime Selling Water to Iraq and Kuwait Despite Water Shortage," *NCRI* (blog), July 27, 2018, <https://www.ncr-iran.org/en/news/society/iran-regime-selling-water-to-iraq-and-kuwait-despite-water-shortage/>.

successful transfer of fresh water through such means and is therefore highly significant to the study of international bulk water trade. Nevertheless, I excluded it from the IBWTB because the water was transferred from within Greece (i.e., the city of Piraeus).<sup>147</sup>

I did, however, include the export of water from China's Guangdong province to Hong Kong prior to 1997. My decision to do so was based on the fact that the trade of water between the two entities was initiated in the 1960s, at which time Hong Kong was still a British colony. Therefore, the water trade between the two entities ought to be categorized as "international" until 1997, at which time Hong Kong was returned to China.<sup>148</sup>

### Criterion 3: The Valuation and Appraisal of Water

The third criterium I applied in filtering my initial list was whether a particular reference involved the valuation and/or appraisal of fresh water. Based on my definition, in order for a reference to truly constitute an instance of "bulk water trade," the terms of trade between the water-exporting and water-importing parties must involve the attribution of value in some capacity to freshwater resources. Therefore, I excluded instances of bulk water export or import that were part of humanitarian efforts or that were "free of charge." For example, I excluded references of the purported export of water from Iran to Iraq in 2009, which was allegedly prompted by a desire to mitigate a severe freshwater shortage in Iraq's predominantly Shia Basra province.<sup>149</sup> I also excluded the 1964 exportation of water from Iraq to Kuwait because it was "free of charge."<sup>150</sup>

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<sup>147</sup> Gleick, *The World's Water: The Biennial Report on Freshwater Resources 1998-1999*, 1:202.

<sup>148</sup> Hong Kong Free Press, "Hong Kong Is Too Reliant on Costly Mainland Water, Says Think Tank - so What's the Alternative?," Hong Kong Free Press HKFP, December 28, 2019, <https://hongkongfp.com/2019/12/28/hong-kong-reliant-costly-mainland-water-says-think-tank-whats-alternative/>; Szwedo, *Cross-Border Water Trade*, 140.

<sup>149</sup> Banafsheh Keynoush, "'Water Diplomacy' It Is Not Enough to Fix Iran-Iraq's Water Dispute" (Rasanah-IIIS, September 6, 2018), 10, <https://rasanah-iiis.org/english/wp-content/uploads/sites/2/2018/09/%E2%80%9CWater-Diplomacy%E2%80%9D-It-is-Not-Enough-to-Fix-Iran-Iraq%E2%80%99s-Water-Dispute.pdf>.

<sup>150</sup> Szwedo, *Cross-Border Water Trade*, 151.

I did, however, include certain references to water exports and imports that did not attach a specific monetary *price* to water. Instead of applying a price to water, these instances involved the barter trade of water for something other than monetary payment. Although I will discuss such instances in greater detail in Chapter 2.3, I briefly review the barter trade of water for electricity and energy resource payments between Kyrgyzstan, Kazakhstan, and Uzbekistan here to better elucidate what such relations entail.

According to the 1998 Agreement on Joint and Complex Use Water and Energy Resources of the Naryn Syr Darya Cascade Reservoirs, Kyrgyzstan agreed to maintain a certain level of water in the Syr Darya River in exchange for the purchase of Kyrgyz electricity, coal, and gas by the downstream states of Kazakhstan and Uzbekistan. As such, while these trade relations did not involve monetary payments for water, they did involve the application and articulation of a set value to a bulk quantity of water that was subsequently exchanged between parties—this value was simply expressed using electricity and energy resources rather than a monetary price.<sup>151</sup>

I chose to include bulk water trades involving such barter exchanges even though some authors may take issue with my decision to do so. Disagreement regarding the inclusion of these instances may stem from the fact that, as I mentioned above, the units of water exported or imported in the context of barter relations are not actually prescribed a set monetary price. Nevertheless, such relations still involve the valuation of water as the object of trade in and of itself by using other goods and/or services to represent the value of the traded water. Seeing as bater water trades meet the conditions of physical water exchange/transfer and water valuation and/or appraisal, I chose to include them in the IBWTB. I do recognize, however, that such trade relations constitute a kind of trade fundamentally distinct from the direct exchange of water for

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<sup>151</sup> Szwedo, 159.

money. Acknowledging this distinction, I communicated it in the presentation of the IBWTB through the classification of these instances as a particular approach to bulk water trade. This approach is explained in Section 2.1.4 and Table 2.

#### Criterion 4: The Exchange of Water as an Object of Trade in its Own Right

The fourth and final criterion I used in compiling the IBWTB was determining whether a reference involved the exchange of untreated, unbottled water as the object of trade in its own right. According to this criterion, if a reference involved the valuation and/or appraisal of something other than the actual water being transferred between parties, it was excluded. References that were excluded based on this criterion often involved the valuation and appraisal of water-related objects/services, such as water treatment or delivery. As such, in the context of such trade relations, these water-related objects/services, and not water itself, were treated as the objects of trade.

For example, I excluded the export of water from the Canadian town of St. Stephen, New Brunswick to the U.S. city of Calais, Maine because the terms of the agreement governing the transfer of water applied a method of valuation, i.e., a pricing scheme, to water delivery and service rather than to the actual water being transferred.<sup>152</sup> I also excluded the export of water from Slovenia to the Italian Commune of Gorizia based on this criterion. According to the terms of Article 13 and Annex V of the 1947 Treaty of Peace with Italy and the Agreement Between the Socialist Federal Republic of Yugoslavia and the Republic of Italy on Water Supply of the Municipality of Gorizia, the price paid by water consumers in Gorizia is to reflect only the operational and maintenance costs of the water supply system that transfers water across the

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<sup>152</sup> Patrick Forest, "A Century of Sharing Water Supplies Between Canadian and American Borderland Communities," *Munk School Briefings*, October 2010, [https://munkschool.utoronto.ca/wp-content/uploads/2012/07/Forest\\_SharingWaterSupplies\\_POWI\\_2010.pdf](https://munkschool.utoronto.ca/wp-content/uploads/2012/07/Forest_SharingWaterSupplies_POWI_2010.pdf).

modern Italian-Slovenian border.<sup>153</sup> These water relations between Gorizia and modern-day Slovenia are examined further in Chapter 2.3 as a case study of the proxy approach to water trade.

This criterium did not prevent me from including the long-established tradition of exporting water in bulk from Canadian ports to foreign ships for on-board uses. The prices included in the terms of these exchanges reflect the valuation of the water being transferred onto the ships rather than the supply or treatment of that water. It is thought that the Canadian City of St. John provides most of the water sold to foreign ships, which are not under the Canadian sovereign authority, according to such relations. Although it is not possible to determine exactly how much water is sold by the City of St. John to foreign ships, the city reportedly earned about \$40,000 from such water sales in 2000. This income reflects the earnings made by exporting water to foreign ships in exchange for monetary payment.<sup>154</sup>

#### **Section 2.1.4: Collecting Supplemental Data (Step 3)**

In Step 3, I collected the following supplemental data regarding the instances included in the IBWTB: the parties involved in the trade; the status of trade relations, the date (year or decade) of initiation; the method of water transfer (i.e., barge/boat, tanker, water bags, pipe, etc.); the source literature used to identify a particular instance; and the approach to water trade represented by an instance. I chose to look for these specific supplemental pieces of information, which are also listed in Table 1, because they allowed for a more complete understanding of a particular instance and the prospect of international trade as a viable means of obtaining water resources.

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<sup>153</sup> Treaty of Peace with Italy, art. 13 and Annex V; DRINKADRIA Shared Platform, *Cross border water supply list: Mrzlek – Grozia (FB4)*, DRINKADRIA Shared Platform, <http://drinkadria.fgg.uni-lj.si/water-supply/cross-border-water-supply-list/mrzlek-gorizia/>.

<sup>154</sup> Ministerial Committee Examining the Export of Bulk Water, “Export of Bulk Water from Newfoundland and Labrador: A Report of the Ministerial Committee Examining the Export of Bulk Water” (Government of Newfoundland and Labrador, October 2001), 39, <https://www.gov.nl.ca/publicat/ReportoftheMinisterailCommitteeExaminingtheExportofBulkWater.PDF>.



Information identifying the parties involved in bulk water trades is critical because it provides important context regarding the possibility of transporting water. It is valuable, for example, to know the geographic proximity of water importers to exporters to better understand the kinds of bulk water trade relations that are feasible or have been in the past. Furthermore, information regarding which countries export/import water or have done so in the past is valuable to interested parties currently looking for either markets to export water to or sources from which to import water. Data demonstrating which and what kinds of countries are willing and able to either export or import water is therefore critical for the potential development of bulk water trade because it allows interested parties to assess trends and make decisions regarding their water resources accordingly.

Information regarding the status and initiation date of a particular instance of bulk water trade is also valuable because it contributes to the understanding of the history and current practicability of bulk water trade. For example, demonstrating that many of these water trading schemes were initiated in the twentieth century and that some of them are still active supports the notion that bulk water trade can be and is a(n) viable and actively used means of fulfilling water demands. As a result, such information furthers the aforementioned objective of the IBWTB and is therefore relevant to include.

One of the most important questions regarding the practicability of international bulk water trade is how water could feasibly be transferred in large quantities from one country to another.<sup>155</sup> Information regarding methods of water transfer employed in instances included in the IBWTB helps address this very question and thereby provides insights regarding the potential development of future bulk water trade relations.

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<sup>155</sup> Gleick et al., “New Economy of Water: The Risks and Benefits of Globalization and Privatization of Fresh Water,” 19; Anderson and Landry, “Exporting Water to the World,” n.d.

I included information regarding the source from which I learned about a particular trade to comply with plagiarism policies and to improve the transparency of the IBWTB for the benefit of the user. The inclusion of source information enables a user of the IBWTB to check for themselves how a particular example of bulk water trade was presented and whether it does in fact exist as an example in the source literature. Additionally, it should be noted that I learned of certain instances from multiple sources. Most sources offered enough information to determine whether a particular instance mentioned therewithin was a duplicate of one I had already included in the IBWTB. Upon making such a determination, I combined the information regarding an instance and the sources used to collect it into one IBWTB entry. There were, however, some instances for which I did not have enough information to determine whether they were duplicates. Erring on the side of caution and continuing my policy of inclusion by default, I chose to include such “suspected” duplicates, since I did not have adequate information to make an affirmative determination regarding their duplicate status.

Finally, I chose to classify the instances, for which I could find enough relevant information, based on the approach to water trade an instance represented. The phrase “approach to water trade” refers to the way in which the parties to a particular instance of bulk water trade “approach,” or treat, water as the object of their trade relations. I selected the labels Philosophy 1, Philosophy 2, and Philosophy 3 to denote these various approaches. I elaborate on these classifications further in the context of specific case studies in Chapter 2.3. For context, however, I summarized the three approaches of water trade represented in the IBWTB in Table 2 below.

Table 2

<b>Water Trade Philosophy</b>	<b>Description of Philosophy</b>
Philosophy 1	Water is treated as the object of trade relations and assigned a set monetary value. Water is exchanged for payment based on agreed-upon terms between exporting and importing parties that were/are neither prompted nor restricted by temporary circumstances regarding the availability of water resources.
Philosophy 2	Water is treated as the object of trade relations and assigned a set monetary value; however, the terms of trade reflect exceptional circumstances that underscore water's status as a non-substitutable essential resource. The terms of trade are also short-term and limited to satisfying a temporary demand.
Philosophy 3	Water resources are exchanged not for money but for other goods or services. As such, this exchange involves the barter trade of water rather than direct trade of water for payment. Such trade nevertheless still involves the valuation and appraisal of water, even though its value is expressed in terms other than monetary payment.

I included information regarding the approach to water trade reflected in a particular instance for two reasons. First, it underscores the relevance of this work. Specifically, the variety of approaches identified demonstrates that there is no uniform practice or standard framework for the international export and import of water resources and that countries engaged in such trade have instead developed their own approaches to it. As such, these observations validate the worthiness of this work, which strives to assess what insights, if any, actual instances of bulk water trade provide regarding the crafting of a more standardized framework for such trade. Second, the classification of these approaches lays the foundation for my analysis of case studies according to their representation of different water trade philosophies.

My decision to focus on the aforementioned supplemental data was also a practical one. There was, unfortunately, a paucity of information regarding many of the instances of bulk water trade I found. For example, Gleick mentions that Fiji and the Bahamas have historically imported fresh water; however, he makes no reference as to when these imports were initiated or from where

they originated.<sup>156</sup> Some of the challenges of collecting information were due to the non-public nature of bulk water trade agreements. This paucity of available information is nevertheless noteworthy because it underscores the lack of regular and consistent records regarding bulk water trade relations.

Despite contacting governments and companies involved in water trade and investigating any publicly available literature I could find on specific bulk water trades, I was unable to obtain a key piece of information for almost all of the instances in the IBWTB: the price/recorded value of water. As such, I did not include a separate column with water pricing or other valuation information. Despite the challenges of working with such limited records, I was able to include information regarding one or more of the elements discussed above for each instance of bulk water trade in the IBWTB.<sup>157</sup>

### **Section 2.1.5: Discussion**

By implementing the process presented in this chapter and applying each aforementioned criterium to my initial list of bulk water trade references, I created the IBWTB. The IBWTB now serves as a central location of known international bulk water trade instances that have been successfully completed and that involved the transnational exchange and appraisal of water as an object of trade in its own right.

By applying my criteria and determining whether a particular set of water relations constituted an actual instance of international of bulk water trade, I was also able to identify a proxy approach to water trade. This proxy approach to water trade refers to the external obtainment

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<sup>156</sup> Gleick, *The World's Water: The Biennial Report on Freshwater Resources 1998-1999*, 1:200.

<sup>157</sup> There is also a column in the IBWTB labeled "notes" containing additional information regarding certain instances. This information does not reflect supplemental data that I collected for the purposes of more completely appreciating a particular instance of bulk water trade; rather, this miscellaneous information was included for clarification purposes for the benefit of future users of the IBWTB. There were relatively few instances for which I included such clarifying information and therefore felt that it was unnecessary to provide a separate analysis for this information in this work.

and transfer of water resources between consenting parties through the export and import of water that *does not serve as an object of trade in its own right and is not subject to valuation or appraisal*. Instead, this approach involves the valuation and appraisal of *water-related* objects/services associated with the physical transfer of water resources. These water-related objects/services act as *proxies* for the water resources actually being transferred from one party to another. As such, water resources that are externally obtained according to this approach fall outside the scope of my definition of bulk water trade. Nevertheless, I chose to include this proxy approach in the extended version of my typology discussed in Chapter 2.3 and refer to it as Philosophy 4 (see Table 4 in Chapter 2.3). I explain my reasoning for doing so and provide a more detailed discussion regarding the characteristics of this approach in Chapter 2.3.

The research process detailed above also led me to discover several examples of interested parties looking to potentially pursue the prospect of bulk water trade in the near or distant future. Such interested parties include governments and private water export companies. For example, motivated by intensifying water scarcity, the Republic of Cyprus has explored the possibility of importing water from Lebanon, Egypt, and/or Greece.<sup>158</sup> Various U.S. states have also explored the possibility of importing water to address water shortages.<sup>159</sup>

South Korean companies have recently expressed an interest in importing glacial spring water from Nepal.<sup>160</sup> Okuru Enterprises, a private New Zealand company, has been trying for

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<sup>158</sup> Reuters Staff, "Drought-Hit Cyprus Eyes Water Imports," *Reuters*, January 9, 2008, <https://www.reuters.com/article/environment-cyprus-drought-dc-idUKL0941690220080109>; waterfortheages, "Cyprus and Water Imports from Greece, Egypt, and Lebanon," *Water for the Ages* (blog), January 11, 2008, <https://waterfortheages.org/2008/01/10/cyprus-and-water-imports-from-greece-egypt-and-lebanon/>; "As Trees Die, Cyprus Republic Looks to Lebanon for Water Import - Green Prophet," November 10, 2013, <https://www.greenprophet.com/2013/11/as-trees-die-cyprus-republic-looks-to-lebanon-for-water-import/>.

<sup>159</sup> Gerbasi, "The Next Privatization of Public Assets: Domestic and Trade Implication Related to Water Right and Land Acquisition," 28.

<sup>160</sup> Nikeeta Gautam, "Korean Companies Interested to Import Spring Water from Nepal," *My Republica*, accessed February 13, 2021, <http://myrepublica.nagariknetwork.com/news/70186/>.

several years to export bulk water from Tuning Form Creek, a tributary of the Arawata River in New Zealand's Mount Aspiring National Park. The company has received government consent to extract the water and build pipes and facilities needed to transport the water from its source to tanker ships off the coast of Jackson Bay. Public opposition, however, has complicated and stymied the company's plans to export the water to markets in the Middle East and Australia.<sup>161</sup> Brúarfoss ehf., an Icelandic water company, has recently made substantial investments in water export technology and has expressed an interest in exporting Icelandic fresh water to global markets using super tankers.<sup>162</sup>

These examples of current and prospective exports and imports of water as an object of trade in its own right underscore the importance of assessing the implications of bulk water trade on water's international status. Doing so, however, requires an understanding of the various conceptualizations, or "definitions," of water articulated in international legal documents and other significant texts relating to the use and management of water resources. These various definitions are explored in the next chapter.

## *Chapter 2.2: The Definitions of Water*

### **Section 2.2.1: Definitions of Water and Their Sources**

As I discussed in Chapter 1.1, a significant consideration in the debate regarding the application of international trade law to bulk water trade involves determining whether untreated, unbottled water would be considered a "good" or "product" under GATT/WTO law as a result of such trade. Answering this question requires directly addressing the controversial treatment

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<sup>161</sup>Laura Walters, "Battle to Sell off West Coast Water Bubbles to the Surface," Stuff, March 28, 2017, <https://www.stuff.co.nz/national/90917593/battle-to-sell-off-west-coast-water-bubbles-to-the-surface>.

<sup>162</sup>Vignir Andri Guðmundsson, "Icelandic Water Company in Water," *Icelandic Times* (blog), September 19, 2016, <https://icelandictimes.com/icelandic-water-company-bruarfoss-meets-growing-global-demand-for-fresh-drinking-water/>.

water as a “good” or “product” in light of its special status.<sup>163</sup> It is important to note, however, that water possesses several “definitions” other than a “human right” and “unique and limited resource” across various international legal regimes.<sup>164</sup>

By “definitions,” I am referring to varying conceptualizations of what water “is” based on how it is defined according to its innate characteristics, the purposes it is used for, and the services it provides. I use the term definitions to describe these conceptualizations of water so as to underscore the application of meaning to water by entities that use and interact with it. These are not definitions in the normal sense, i.e., definitions found in a common language dictionary; rather, they refer to the different statuses and roles assigned to water by actors from within the international community of states that utilize water to fulfill certain needs and interests. Such definitions include, *inter alia*, water as a human right, an essential resource, a border between countries, a space of transit and trade, an ecosystem, a public good, and an economic good.

In what follows, I provide a survey analysis of how water is “defined” and described within the context of various primary and subsidiary sources of international law and other significant texts relating to the use and management of water resources (i.e., UN resolutions, UN directives, international agreements and conventions, judicial rulings involving state parties, etc.) from an assortment of international legal regimes (i.e., human rights law, environmental law, trade law, etc.).<sup>165</sup> The definitions of water I review in this section are summarized in Table 3.

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<sup>163</sup> A more extensive definition of water’s “special status” is offered in Chapter 1.1.

<sup>164</sup> Gleick et al., “New Economy of Water: The Risks and Benefits of Globalization and Privatization of Fresh Water,” 5–9; Szwedo, *Cross-Border Water Trade*, 17, 26–27.

<sup>165</sup> According to Article 38(1) of the Statute of the International Court of Justice, international conventions, international customs, and general principles of law are all sources of international law. Article 38(1)(d) also identifies judicial decisions and the works of legal scholars as “subsidiary” sources of international law. The survey of water’s various statuses and definitions offered here is not intended to prove the existence of strict legal obligations regarding the use and management of global water resources; rather, the purpose of this section is simply to demonstrate that numerous conceptualizations regarding what water is have been identified by the international community. As such, I include texts that ought not to be classified as sources of international law but that are still

Table 3

Definition	Summary Description	Example Sources
1. Water: (n.) a human right	All people, based on their humanity, have a right to a certain amount of water in accordance with their basic needs as humans.	<ul style="list-style-type: none"> <li>• African Charter on the Rights and Welfare of the Child (1999)</li> <li>• Berlin Rules on Water Resources (2004)</li> <li>• Convention on the Elimination of All Forms of Discrimination against Women (1979)</li> <li>• Convention on the Rights of Persons with Disabilities (2008)</li> <li>• Convention on the Rights of the Child (1990)</li> <li>• General Comment No. 15 on The Right to Water (2003)</li> <li>• International Labour Organization Convention No. 161 on Occupational Health Services (1988)</li> <li>• Mar del Plata Action Plan (1977)</li> <li>• Principle 18 of the Guiding Principles on Internal Displacement (2004)</li> <li>• Protocol to the African Charter on Human and People's Rights on the Rights of Women in Africa (2003)</li> <li>• UNGA Resolution 64/292</li> <li>• UNHRC Decision 2/104</li> <li>• UNHRC Resolutions: 6/8, 15/9, 7/22, and 12/8</li> </ul>
2. Water: (n.) an essential resource	Water is a natural resource that is essential to development and all life on Earth.	<ul style="list-style-type: none"> <li>• Declaration of the Hague Ministerial Declaration of the Hague on Water Security in the 21st Century (2000)</li> <li>• Ministerial Declaration Adopted by the Ministers Meeting in the Ministerial Session of the International Conference on Freshwater (2001)</li> <li>• Ministerial Declaration of the Message from the Lake Biwa and Yodo River Basin (2003)</li> <li>• Principle 1 of the Dublin Statement on Water and Sustainable Development (1992)</li> <li>• Protocol on Water and Health to the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (1992)</li> <li>• UNGA Comprehensive Assessment of the Freshwater Resources of the World (1997)</li> </ul>
3. Water: (n.) an	Water is an international	<ul style="list-style-type: none"> <li>• Arbitral Awards in the <i>Helmand River Delta Disputes</i> (1872)</li> </ul>

critical to understanding and appreciating how water is conceptualized by international actors in my survey of definitions. *See:* Statute of the International Court of Justice, art. 38(1).



international boundary	boundary between sovereign states.	<ul style="list-style-type: none"> <li>• Arbitral Awards in the <i>Kushk River Case</i> (1893)</li> <li>• Boundary and Water Sharing Treaties, including: <ul style="list-style-type: none"> <li>• Treaty between the United States of America and the Mexican Republic Relative to Boundary Line, Transit of Persons, etc. across the Isthmus of Tehuantepec (1853)</li> <li>• Treaty to Resolve Pending Boundary Difference and Maintain the Rio Grande and Colorado River as the International Boundary between the United States of America and Mexico (1970)</li> </ul> </li> </ul>
4. Water: (n.) a source of contention	Water is the source of contention and disagreement between state parties.	<ul style="list-style-type: none"> <li>• <i>Case Concerning the Gabčíkovo-Nagymaros Project (Hungary v. Slovakia)</i> (1997)</li> </ul>
5. Water: (n.) a basis on which to cooperate	Water is a basis on which states, particularly those sharing a common watercourse, are compelled to cooperate through processes such as information sharing and consultations.	<ul style="list-style-type: none"> <li>• Berlin Rules on Water Resources (2004)</li> <li>• Mar del Plata Action Plan (1977)</li> <li>• UN Convention on the Non-Navigational Uses of International Watercourses (1997)</li> <li>• UN Convention on the Protection and Use of Transboundary Watercourses and International Lakes (1996)</li> </ul>
6. Water: (n.) a space of transit and trade	Water is a space within which states and their inhabitants can participate in the activities of transportation and trade.	<ul style="list-style-type: none"> <li>• Barcelona Convention and Statute on Freedom of Transit (1921)</li> <li>• Berlin Rules on Water Resources (2004)</li> </ul>
7. Water: (n.) an ecosystem, a part of the environment, and a habitat	Water is not only a critical part of the larger natural environment, but also an environment in and of itself that serves as a habitat for aquatic and semi-aquatic species of flora and fauna.	<ul style="list-style-type: none"> <li>• Agenda 21 of the United Nations Conference on Environment and Development (1992)</li> <li>• Berlin Rules on Water Resources (2004)</li> <li>• Convention on Wetlands of International Importance Especially as Waterfowl Habitat (1971)</li> <li>• Mar del Plata Action Plan (1977)</li> <li>• Protocol on Water and Health, the Economic Commission for Europe (1999)</li> </ul>
8. Water: (n.) a limited resource in	Water, particularly fresh water, is a limited and exhaustible resource	<ul style="list-style-type: none"> <li>• Agenda 21 of the United Nations Conference on Environment and Development (1992)</li> </ul>

need of protection	that requires considerations for its protection and care in the ways it is used and managed.	<ul style="list-style-type: none"> <li>• Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (1989)</li> <li>• Convention on the Protection and Use of Transboundary Watercourses and International Lakes (1992)</li> <li>• General Comment No. 15 on The Right to Water (2003)</li> <li>• Potentially applicable WTO AB rulings: <ul style="list-style-type: none"> <li>• <i>United States – Import Prohibition of Certain Shrimp and Shrimp Products (US – Shrimp)</i> (1998)</li> <li>• <i>United States – Standards for Reformulated and Conventional Gasoline (US – Gasoline)</i> (1996)</li> </ul> </li> <li>• The Helsinki Rules on the Uses of the Waters of International Rivers (1966)</li> <li>• UN Convention on the Non-Navigational Uses of International Watercourses (1997)</li> </ul>
9. Water: (n.) a part of a sovereign state	Water is a territorial part of a state, which has a degree of sovereign control of the water within its territory.	<ul style="list-style-type: none"> <li>• <i>Faber Case (Germany v. Venezuela)</i> (1903)</li> <li>• <i>Lake Lanoux Arbitration (France v. Spain)</i> (1957)</li> </ul>
10. Water: (n.) a national security interest	Water resources may be identified by states as national security interests.	<ul style="list-style-type: none"> <li>• <i>Dispute Regarding Navigational and Related Rights (Costa Rica v. Nicaragua)</i> (2009)</li> </ul>
11. Water: (n.) a basis of a community and a shared resource	Water is a basis on which states can come together to form a community of common interests, as well as a resource that is shared across international boundaries.	<ul style="list-style-type: none"> <li>• <i>Case Concerning Pulp Mills on the River Uruguay (Argentina v. Uruguay)</i> (2010)</li> <li>• <i>Case Relating to the Territorial Jurisdiction of the International Commission of the River Oder</i> (1929)</li> </ul>
12. Water: (n.) a public and social good	Water is a resource that exists for the benefit and well-being of the public and should, <i>ipso facto</i> , be treated in a way that honors such a status.	<ul style="list-style-type: none"> <li>• Agenda 21 of the United Nations Conference on Environment and Development (1992)</li> <li>• General Comment No. 15 on The Right to Water (2003)</li> </ul>

13. Water: (n.) an economic good	Water is a resource with both economic value and competing uses and should, <i>ipso facto</i> , be treated in a way that honors such a status.	<ul style="list-style-type: none"> <li>• Agenda 21 of the United Nations Conference on Environment and Development (1992)</li> <li>• <i>Case Concerning Pulp Mills on the River Uruguay (Argentina v. Uruguay)</i> (2010)</li> <li>• Potentially applicable WTO AB rulings: <ul style="list-style-type: none"> <li>• <i>United States – Final Countervailing Duty Determination with respect to certain Softwood Lumber from Canada (US – Softwood Lumber IV)</i> (2004)</li> </ul> </li> <li>• Principle 4 of the Dublin Statement on Water and Sustainable Development (1992)</li> <li>• Resolution on the Use of International Non-Maritime Waters (1961)</li> </ul>
14. Water: (n.) an explicitly non-economic good	Water is a resource that, regardless of its status as a public or social good, is not an economic good in its natural form.	<ul style="list-style-type: none"> <li>• Canada-United States-Mexico Declaration on Water Resources and the NAFTA (1993)</li> <li>• Protection of the Waters of the Great Lakes: Final Report to the Governments of Canada and the United States (2000)</li> <li>• Side Letter on Natural Water Resources, United States-Mexico-Canada Agreement (USMCA) (2018)</li> </ul>

The survey analysis presented in this section is not intended to be exhaustive; rather, its expansiveness is intended to capture the main ideas regarding how water is defined within the scope of legal and other significant texts concerning the use and management of international water resources. My decision to analyze an extensive variety of sources was based on my goal of determining how diverse the spectrum of water's definitions is. The analysis I discuss here builds on Giordano et al.'s and Hamner and Wolf's discussion of how water is presented in transboundary freshwater treaties.<sup>166</sup> According to Giordano et al., water has been addresses as “a scarce or consumable resource, a quantity to be managed, [and] an ecosystem to be improved or maintained” in the provisions of such treaties.<sup>167</sup>

<sup>166</sup> Giordano et al., “A Review of the Evolution and State of Transboundary Freshwater Treaties”; Jesse H. Hamner and Aaron T. Wolf, “WATER:I. Patterns in International Water Resource Treaties:The Transboundary Freshwater Dispute Database,” *Colorado Journal of International Environmental Law and Policy*, Yearbook, no. 157 (1997), <https://advance-lexis-com.proxy.library.georgetown.edu/api/document?collection=analytical-materials&id=urn:contentItem:3XC2-6Y00-00CV-H06B-00000-00&context=1516831>.

<sup>167</sup> Giordano et al., “A Review of the Evolution and State of Transboundary Freshwater Treaties,” 249.

## Section 2.2.2: Water's Diverse Definitions

### Water as a Human Right

The human right to water is recognized explicitly and implicitly in numerous international texts and directives relating to the use and management of global water resources. Access to safe drinking water was first recognized as a human right by UN member states in the Mar del Plata Action Plan, which was approved at the 1977 UN Conference on Water.<sup>168</sup> According to Resolution 2(a) of the Mar del Plata Action Plan:

“All peoples, whatever their stage of development and their social and economic conditions, have the right to have access to drinking water in quantities and of a quality equal to their basic needs.”<sup>169</sup>

As I mentioned in Chapter 1.1, the notion of water as a resource that all humans have a right to access is also found in the CESCR's General Comment No. 15 on The Right to Water: “The human right to water is indispensable for leading a life in human dignity. It is a prerequisite for the realization of other human rights.”<sup>170</sup> General Comment No. 15 also calls on states to “facilitate [the] realization of the right to water in other countries, for example through [the] provision of water resources.”<sup>171</sup> Particularly relevant to the discussion of bulk water trade are the provisions expressed in paragraph 35 of General Comment No. 15, according to which “[a]greements concerning trade liberalization should not curtail or inhibit a country's capacity to ensure the full realization of the right to water.”<sup>172</sup>

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<sup>168</sup> United Nations General Assembly. Report of the United Nations High Commissioner for Human Rights on the Scope and Content of the Relevant Human Rights Obligations Related to Equitable Access to Safe Drinking Water and Sanitation Under International Human Rights Instruments. Sixth session of the Human Rights Council. A/HRC/6/3 (Aug. 16, 2007), [hereinafter A/HRC/6/3] <https://undocs.org/A/HRC/6/3>.

<sup>169</sup> United Nations Water Conference. Report of the United Nations Water Conference, Mar Del Plata. E/CONF.70/29 (March 14-25, 1977), [hereinafter Mar Del Plata Action Plan]

[https://www.internationalwaterlaw.org/bibliography/UN/UN\\_Mar%20del%20Plata%20Action%20Plan\\_1977.pdf](https://www.internationalwaterlaw.org/bibliography/UN/UN_Mar%20del%20Plata%20Action%20Plan_1977.pdf).

<sup>170</sup> General Comment No. 15, para. 1.

<sup>171</sup> General Comment No. 15, para. 34.

<sup>172</sup> General Comment No. 15, para. 35.

Several international conventions and charters also make explicit reference to a right to water for either drinking, sanitation, or unnamed purposes. These include the Convention on the Elimination of All Forms of Discrimination against Women, the Convention on the Rights of the Child, the Convention on the Rights of Persons with Disabilities, the International Labour Organization Convention No. 161 of 1985 on Occupational Health Services, the African Charter on the Rights and Welfare of the Child, and the Protocol to the African Charter on Human and People’s Rights on the Rights of Women in Africa.<sup>173</sup> The right to water is also named in international guidelines and principles, such as Principle 18 of the Guiding Principles on Internal Displacement.<sup>174</sup>

The notion of a human right to water is further reiterated in numerous resolutions of the UN Human Rights Council (UNHRC), including resolutions 6/8, 15/9, 7/22, and 12/8, and is also articulated in UNHRC Decision 2/104 regarding human rights and access to water.<sup>175</sup> In 2010, the UNGA issued Resolution 64/292, which recognized “the right to safe and clean drinking water and sanitation as a human right that is essential for the full enjoyment of life and all human rights.”<sup>176</sup> The Berlin Rules on Water Resources (Berlin Rules), which were adopted by the International Law Association (ILA) in 2004 as a summary of international legal tenets and

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<sup>173</sup> A/HRC/6/3, Annex I.

<sup>174</sup> A/HRC/6/3, Annex II.

<sup>175</sup> United Nations Human Rights Council, Resolution 6/8, Human Rights and Equitable Access to Safe Drinking Water and Sanitation, A/HRC/RES/6/8 (Sept. 28, 2007), [https://ap.ohchr.org/documents/E/HRC/resolutions/A\\_HRC\\_RES\\_6\\_8.pdf](https://ap.ohchr.org/documents/E/HRC/resolutions/A_HRC_RES_6_8.pdf); United Nations General Assembly, Resolution Adopted by the Human Rights Council 15/9, Human Rights and Access to Safe Drinking Water and Sanitation, A/HRC/RES/15/9 (Sept. 30, 2010), <https://documents-dds-ny.un.org/doc/UNDOC/GEN/G10/166/33/PDF/G1016633.pdf?OpenElement>; United Nations Human Rights Council, Resolution 7/22, Human Rights and Access to Safe Drinking Water and Sanitation, A/HRC/RES/7/22 (March 28, 2008), [https://ap.ohchr.org/documents/E/HRC/resolutions/A\\_HRC\\_RES\\_7\\_22.pdf](https://ap.ohchr.org/documents/E/HRC/resolutions/A_HRC_RES_7_22.pdf); United Nations General Assembly, Resolution Adopted by the Human Rights Council 12/8, Human Rights and Access to Safe Drinking Water and Sanitation, A/HRC/RES/12/8 (Oct. 12, 2009), <https://undocs.org/en/A/HRC/Res/12/8>; United Nations Human Rights Council, Decision 2/104, Human Rights and Access to Water, A/HRC/DEC/2/104 (Nov. 27, 2006), [https://www2.ohchr.org/english/issues/water/docs/HRC\\_decision2-104.pdf](https://www2.ohchr.org/english/issues/water/docs/HRC_decision2-104.pdf).

<sup>176</sup> United Nations General Assembly, Resolution 64/292, The Human Right to Water and Sanitation, A/RES/64/292 (July 28, 2010), <https://undocs.org/A/RES/64/292>.

principles customarily applied to freshwater resources, also apply the status of a human right to water and water access. Under Article 17(1) of the Berlin Rules, “every individual has a right of access to sufficient, safe, acceptable, physically accessible, and affordable water to meet that individual’s vital human needs.”<sup>177</sup>

These texts serve as evidence of water’s definition as a human right. Based on the texts reviewed, this definition can be described in sum as the notion that all people, based on their humanity, have a right to a certain amount of water in accordance with their basic needs as humans.

### Water as an Essential Resource

Water is also explicitly defined as an essential resource. According to the March 2000 Declaration of the Hague Ministerial Declaration of the Hague on Water Security in the 21st Century, “water is vital for the life and health of people and ecosystems and a basic requirement for the development of countries.”<sup>178</sup> The 2001 Ministerial Declaration Adopted by the Ministers Meeting in the Ministerial Session of the International Conference on Freshwater noted that “water plays a vital role in relation to human health, livelihood, economic growth, as well as sustaining ecosystems.”<sup>179</sup>

This conceptualization of water is also found in Principle 1 of the Dublin Statement on Water and Sustainable Development (Dublin Principles), which states that “fresh water is a finite and valuable resource, essential to sustain life, development, and the environment.”<sup>180</sup> It is also found in the Protocol on Water and Health to the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Protocol on Water and Health), the 1997

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<sup>177</sup> International Law Association, “Berlin Rules on Water Resources,” Aug. 2004, [hereinafter Berlin Rules] [http://www.cawater-info.net/library/eng/l/berlin\\_rules.pdf](http://www.cawater-info.net/library/eng/l/berlin_rules.pdf).

<sup>178</sup> World Water Council, “Ministerial Declaration of The Hague on Water Security in the 21st Century,” March 22, 2000, [https://www.worldwatercouncil.org/sites/default/files/World\\_Water\\_Forum\\_02/The\\_Hague\\_Declaration.pdf](https://www.worldwatercouncil.org/sites/default/files/World_Water_Forum_02/The_Hague_Declaration.pdf)

<sup>179</sup> Gleick, *The World’s Water: The Biennial Report on Freshwater Resources 2002-2003*, 3:178.

<sup>180</sup> Dublin Principles, Principle No. 1.

UNGA Comprehensive Assessment of the Freshwater Resources of the World, and the 2003 Ministerial Declaration of the Message from the Lake Biwa and Yodo River Basin.<sup>181</sup>

These texts evidence the defining of water as an essential resource. Based on the configuration of this definition in the contexts of the documents reviewed, this definition can be described in sum as the notion that water is a natural resource that is essential to development and all life on Earth.

### Water as an International Boundary

Water's definition as an international boundary between states is articulated in various judicial decisions regarding shared water resources. For example, in the various arbitral awards rendered in the disputes between Afghanistan and Persia regarding the Helmand River Delta, the Helmand River is identified as forming part of the boundary between the two parties. In his 1872 arbitral award regarding the boundary dispute, British Commissioner General Goldsmid determined that "Persian should not possess land on the right bank of the Helmand" and that "the main bed of the Helmand ... below Kohak should be the eastern boundary of Persian Sistan."<sup>182</sup> In this context, the water of the Helmand is defined as an international boundary. Water, specifically the water of the Kushk River in Central Asia, is also defined as an international boundary per the terms of the 1893 arbitral award rendered in the *Kushk River Case* between Great

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<sup>181</sup> United Nations Economic and Social Council, Protocol on Water and Health to the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes, MP.WAT/2000/1 (October 18, 1999), [hereinafter Protocol on Water and Health] <https://unece.org/DAM/env/documents/2000/wat/mp.wat.2000.1.e.pdf>; United Nations Economic and Social Council, Comprehensive Assessment of the Freshwater Resources of the World, Report of the Secretary-General, E/CN.17/1997/9 (Feb. 4, 1997), [hereinafter Comprehensive Assessment of the Freshwater Resources] <https://www.un.org/esa/documents/ecosoc/cn17/1997/ecn171997-9.htm>; United Nations General Assembly, Letter dated 9 April 2003 from the Permanent Representative of Japan to the United Nations addressed to the Secretary-General, A/57/783 (April 11, 2003), available at <https://digitallibrary.un.org/record/492803?ln=en>.

<sup>182</sup> Development Law Service FAO Legal Office, "Summary of Decisions by International Tribunals Including Arbitral Awards," in *Sources of International Water Law*, vol. 65, FAO Legislative Study (Rome, Italy: Food and Agriculture Organization of the United Nations, 1998), <http://www.fao.org/3/w9549e/w9549e01.htm#bm01>.

Britain and Russia concerning the border between Afghanistan and modern-day Turkmenistan, which was part of Russia at the time of the dispute.<sup>183</sup>

Various transnational boundary and water sharing treaties also define water as a boundary. For example, Article 1 of the 1853 Treaty between the United States of America and the Mexican Republic Relative to Boundary Line, Transit of Persons, etc. across the Isthmus of Tehuantepec designates portions of the Rio Grande and Colorado rivers as forming the boundary between the United States and Mexico.<sup>184</sup> This designation is clarified in the 1970 Treaty to Resolve Pending Boundary Difference and Maintain the Rio Grande and Colorado River as the International Boundary between the United States of America and Mexico (the Boundary Treaty of 1970). According to its introduction, the Boundary Treaty of 1970 was nominally concluded in order to:

“...restore to the Rio Grande its character of international boundary in the reaches where that character has been lost, and preserve for the Rio Grande and Colorado River the character of international boundaries ascribed to them by the boundary treaties in force.”<sup>185</sup>

These texts demonstrate the defining of water as a boundary between states, and this definition of water is articulated as such in the language of their provisions.

#### Water as a Source of Contention and Basis for Cooperation

Water is also defined as a source of contention and disagreement between state parties. For example, in its decision regarding the *Case Concerning the Gabčíkovo-Nagymaros Project (Hungary v. Slovakia)*, the ICJ recognized the waters of the Danube River—particularly their management and protection in light of the construction of dams and a barrage system—as being a

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<sup>183</sup> Development Law Service FAO Legal Office.

<sup>184</sup> Treaty between the United States of America and the Mexican Republic Relative to Boundary Line, Transit of Persons, etc., Across the Isthmus of Tehuantepec, art. 1, Dec. 30, 1853, *United States Treaty Series* no. 208, [https://www.ibwc.gov/Files/Treaty\\_of\\_1853.pdf](https://www.ibwc.gov/Files/Treaty_of_1853.pdf).

<sup>185</sup> Treaty to Resolve Pending Boundary Differences and Maintain the Rio Grande and Colorado River as the International Boundary between the United States of America and Mexico, Nov. 23, 1970, *Treaties and Other International Acts Series* 7313: p.3, [https://www.state.gov/wp-content/uploads/2020/02/US\\_Mexico\\_1970.pdf](https://www.state.gov/wp-content/uploads/2020/02/US_Mexico_1970.pdf).



source of disagreement between the parties to the case.<sup>186</sup> Water, however, is also commonly referred to as a basis on which countries are compelled to cooperate. For example, under Article 8 of the UN Convention on the Non-Navigational Uses of International Watercourses (the New York Convention), state parties are to “cooperate on the basis of sovereign equality, territorial integrity, mutual benefit and good faith in order to attain optimal utilization and adequate protection of an international watercourse.”<sup>187</sup> This cooperation is further emphasized in New York Convention by the requirement to regularly exchange “data and information on the condition of a watercourse,” as is articulated in Article 9, and to “enter into consultations” with other watercourse states “concerning the management of an international watercourse,” according to Article 24.<sup>188</sup>

The definition of water as the basis for cooperation is also found in Articles 4 and 5 and in Chapter 11 of the Berlin Rules, Articles 5 and 9 in the UN Convention on the Protection and Use of Transboundary Watercourses and International Lakes, and paragraphs 84 to 103 of the Mar del Plata Action Plan.<sup>189</sup> The presentation of the definition of water as a basis for cooperation in the context of these sources can be summarized as follows: water is a basis on which states, particularly those sharing a common watercourse, are compelled to cooperate through processes such as the sharing of information and consultations.

### Water as a Space of Transit and Trade

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<sup>186</sup>Case Concerning the Gabčíkovo-Nagymaros Project (Hung. v. Slov.), Judgement, 1997 I.C.J. Rep. 7 (Sept. 25), <https://www.icj-cij.org/public/files/case-related/92/092-19970925-JUD-01-00-EN.pdf>.

<sup>187</sup>United Nations General Assembly, Resolution 51/229, annex, Convention on the Law of the Non-Navigational Uses of International Watercourses, art. 8, A/51/229 (May 21, 1997), [hereinafter New York Convention] <https://treaties.un.org/doc/Publication/UNTS/No%20Volume/52106/Part/I-52106-0800000280025697.pdf>.

<sup>188</sup>New York Convention, arts. 9 and 24.

<sup>189</sup>Berlin Rules, art. 4-5; Convention on the Protection and Use of Transboundary Watercourses and International Lakes, arts. 5 and 9, Oct. 6, 1996, 1936 U.N.T.S. 269, [hereinafter Water Convention] [https://treaties.un.org/doc/Treaties/1992/03/19920317%2005-46%20AM/Ch\\_XXVII\\_05p.pdf](https://treaties.un.org/doc/Treaties/1992/03/19920317%2005-46%20AM/Ch_XXVII_05p.pdf); Mar del Plata Action Plan, para. 84-103.

Water has also been defined as a space of transit and trade. According to Article 43 of the Berlin Rules, “each riparian State is entitled to freedom of navigation on the entire watercourse to which they are riparian on a basis of equality and nondiscrimination.”<sup>190</sup> In the context of the Berlin Rules, freedom of navigation is understood to include the “freedom to transport goods and passengers.”<sup>191</sup> A watercourse is considered navigable if it is “used for commercial navigation or is capable of being so used in its natural condition.”<sup>192</sup> The 1921 Barcelona Convention and Statute on Freedom of Transit is an international treaty ensuring the freedom of transit for various commercial goods across international boundaries.<sup>193</sup>

Water’s definition as a space of transit and trade, per the provisions of these texts, can therefore be summarized as the notion that water is a space within which states and their inhabitants can participate in the activities of transportation and trade.

#### Water as an Ecosystem, a Part of the Environment, and a Habitat

Water is also defined as an ecosystem, an integral part of the environment, and a habitat. The Protocol on Water and Health, the Economic Commission for Europe acknowledged that “the benefits to human health and well-being that accrue from wholesome and clean water and a harmonious and properly functioning water environment.”<sup>194</sup> Article 3 of the Berlin Rules includes the notion of “water” in several definitions of environmental terms, including “ecological integrity” and “environment.”<sup>195</sup> Chapter 5 of the Berlin Rules concerns the protection of “aquatic environments,” of which water is a principle and defining element.<sup>196</sup> Paragraph 18.8 of the

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<sup>190</sup> Berlin Rules, art. 43(1).

<sup>191</sup> Berlin Rules, art. 43(5)(C).

<sup>192</sup> Berlin Rules, art. 43(4).

<sup>193</sup> Barcelona Convention and Statute on Freedom of Transit, April 20, 1921, 7 U.N.T.S.11, <https://treaties.un.org/doc/Publication/UNTS/LON/Volume%207/v7.pdf>.

<sup>194</sup> Protocol on Water and Health, p.2.

<sup>195</sup> Berlin Rules, art. 3.

<sup>196</sup> Berlin Rules, Chapter 5.

Agenda 21 of the 1992 UN Conference on Environment and Development (Agenda 21) identifies water as being, *inter alia*, “an integral part of the ecosystem.”<sup>197</sup> Article 1 of the 1971 Convention on Wetlands of International Importance Especially as Waterfowl Habitat, also known as the Ramsar Convention, demonstrates the status of water as a habitat by incorporating water into the definition of a “wetland.”<sup>198</sup> Paragraphs 22 to 24 of the Mar del Plata Action Plan, which speak to the use of water for fisheries, also present water as a habitat.<sup>199</sup>

These texts reflect how water is defined as an ecosystem, a part of the environment, and a habitat. Based on the presentation of this definition in these texts, this definition of water can be described as the notion that water is not only a critical part of the larger natural environment but also an environment in and of itself that serves as a habitat for aquatic and semi-aquatic species of flora and fauna.

#### Water as a Limited Resource in Need of Protection

States have also come to define water as a limited resource in need of protection. The first paragraph of the introduction to General Comment No. 15 explicitly names water as “a limited natural resource.”<sup>200</sup> In addition to protecting rights to water, state parties are also called to protect “natural water resources...from contamination by harmful substances and pathogenic microbes.”<sup>201</sup> Although not explicitly dealing with water resources, various WTO AB rulings regarding the interpretation of the phrase “exhaustible natural resources” in GATT Article XX(g)

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<sup>197</sup> United Nations Division for Sustainable Development, *UN Conference on Environment and Development, Rio de Janeiro, Brazil, June 3-14, 1992, Agenda 21*, A/CONF.151/26 (Vol. I-III) (June 3-14, 1992), [hereinafter Agenda 21] <https://sustainabledevelopment.un.org/content/documents/Agenda21.pdf>.

<sup>198</sup> Convention on Wetlands of International Importance Especially as Waterfowl Habitat, Dec. 21, 1975, 996 U.N.T.S. 245 <https://treaties.un.org/doc/Publication/UNTS/Volume%20996/volume-996-I-14583-English.pdf>.

<sup>199</sup> Mar del Plata Action Plan, para. 22-24.

<sup>200</sup> General Comment No. 15, para. 1.

<sup>201</sup> General Comment No. 15, para. 8.

suggest the plausibility of classifying fresh water as an “exhaustible,” or limited, “natural resource.”<sup>202</sup>

For example, by finding that sea turtles are in fact “exhaustible” in *United States – Import Prohibition of Certain Shrimp and Shrimp Products (U.S. – Shrimp)*, the AB expanded the application of “exhaustible” to include biological organisms capable of reproduction and susceptible to intensive over-exploitation.<sup>203</sup> This ruling is significant from the perspective of water resources because water is sometimes thought of as a renewable resource due to the processes of the hydrological cycle; however, the proper functioning of these processes, which is required for the renewability of water resources, is compromised by over-exploitation.<sup>204</sup> In *United States – Standards for Reformulated and Conventional Gasoline (U.S. – Gasoline)*, the WTO AB found that clean air constituted an “exhaustible natural resource” under the provisions of GATT Article XX(g).<sup>205</sup> This ruling is significant from the perspective of water resources because it demonstrated the applicability of the label “exhaustible” to an essential natural resource, air, that is often thought to be renewable in the same way water, another essential natural resource, is.<sup>206</sup> In light of these rulings, characterizing fresh water, which has both renewable and exhaustible properties, as an “exhaustible natural resource” would appear to be consistent with the WTO’s expansive understanding of the phrase.<sup>207</sup>

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<sup>202</sup> World Trade Organization, “WTO Rules and Environmental Policies: GATT Exceptions,” World Trade Organization, 2021, [https://www.wto.org/english/tratop\\_e/envir\\_e/envt\\_rules\\_exceptions\\_e.htm](https://www.wto.org/english/tratop_e/envir_e/envt_rules_exceptions_e.htm).

<sup>203</sup> Panel Report, *United States - Import Prohibition of Certain Shrimp and Shrimp Products*, WTO Doc. WT/DS58/R (May, 15 1998), [https://www.wto.org/english/tratop\\_e/dispu\\_e/58r00.pdf](https://www.wto.org/english/tratop_e/dispu_e/58r00.pdf).

<sup>204</sup> Food and Agriculture Organization of the United Nations, “Review of World Water Resources by Country,” Water Reports (Rome, Italy: Food and Agriculture Organization of the United Nations, 2003), <http://www.fao.org/3/y4473e/y4473e00.htm#Contents>.

<sup>205</sup> Appellate Body Report and Panel Report, *United States – Standards for Reformulated and Conventional Gasoline*, WTO Doc. WT/DS2/R (May 20, 1996), [https://www.wto.org/english/tratop\\_e/dispu\\_e/2-9.pdf](https://www.wto.org/english/tratop_e/dispu_e/2-9.pdf).

<sup>206</sup> Stanford S. Smith, “Renewable and Nonrenewable Resources,” Penn State Extension, June 23, 2006, <https://extension.psu.edu/renewable-and-nonrenewable-resources>.

<sup>207</sup> Szwedo, *Cross-Border Water Trade*, 41.

Articulations of water's status as a resource in need of protection can be found in the Helsinki Rules on the Uses of the Waters of International Rivers (Helsinki Rules), the Convention on the Protection and Use of Transboundary Watercourses and International Lakes, and the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal.<sup>208</sup> Furthermore, according to Article 20 of the New York Convention, "watercourse States shall, individually and, where appropriate, jointly, protect and preserve the ecosystems of international watercourses."<sup>209</sup> Per the terms of Article 18.8 of Agenda 21, "water resources have to be protected, taking into account the functioning of aquatic ecosystems and the perenniality of the resource, in order to satisfy and reconcile needs for water in human activities."<sup>210</sup>

The provisions of these sources and texts define water as a limited resource in need of protection. This definition can be clarified as the notion that water, particularly fresh water, is a limited and exhaustible resource that requires considerations for its protection and care in the ways it is used and managed.

#### Water as Part of a Sovereign State and a National Security Interest

Water has also been defined as a part of a sovereign state, as in the 1957 *Lake Lanoux Arbitration (France v. Spain)* and the international arbitral award in the 1903 *Faber Case (Germany v. Venezuela)*.<sup>211</sup> In the *Lake Lanoux Arbitration*, the Arbitration Tribunal found that the waters of Lake Lanoux lie "on French territory" and that France was legally allowed to divert

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<sup>208</sup>International Law Association, "The Helsinki Rules on the Uses of the Waters of International Rivers," Aug. 1966, [https://www.internationalwaterlaw.org/documents/intldocs/ILA/ILA-HelsinkiRules1966-as\\_amended.pdf](https://www.internationalwaterlaw.org/documents/intldocs/ILA/ILA-HelsinkiRules1966-as_amended.pdf); Water Convention, preamble, arts. 2-3, and Annex III; Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, March 22, 1989, 1673 U.N.T.S 125, available at <http://www.basel.int/TheConvention/Overview/TextoftheConvention/tabid/1275/Default.aspx>.

<sup>209</sup> New York Convention, art. 20.

<sup>210</sup> Agenda 21, art. 18.8.

<sup>211</sup> *Lake Lanoux Arbitration (Fr. v. Spain)*, 12 R.I.A.A. 281 (Arb. Trib. 1957), *translated in* 24 I.L.R. 101, 101 n.2, 109-110 (1961), [hereinafter *Lake Lanoux Arbitration*] [http://www.cawater-info.net/bk/water\\_law/pdf/france\\_v\\_spain.pdf](http://www.cawater-info.net/bk/water_law/pdf/france_v_spain.pdf); *Faber Case (Ger. v. Ven)*, 10 R.I.A.A. 438, 467. Duffield, Henry M., arb. (1903), [hereinafter *Faber Case*] [https://legal.un.org/riaa/cases/vol\\_X/438-467.pdf](https://legal.un.org/riaa/cases/vol_X/438-467.pdf).

waters naturally flowing into the lake because these waters “are subject to the sovereignty of the State in which they are located.”<sup>212</sup> In the *Faber Case*, Henry M. Duffield, an umpire appointed by a German-Mixed Claims Commission to resolve the dispute between Germany and Venezuela, rendered a decision recognizing that the waters in question were part of Venezuelan territory and that, as a result, Venezuela had sovereign control over them and their use.<sup>213</sup> Accordingly, the definition of water as a part of a sovereign nation can be further described as the notion that water is a territorial part of a state, which has a degree of sovereign control of the water within its territory.

Water has also been identified as a national security interest, such as in the *Dispute Regarding Navigational and Related Rights (Costa Rica v. Nicaragua)*, wherein the ICJ held that Nicaragua had a right to regulate activity on the San Juan River for national security reasons.<sup>214</sup> Accordingly, water resources may be defined as national security interests.

#### Water as a Basis of a Community and a Shared Resource

In addition to its status as an integral part of a sovereign nation, water has been defined as a unifying element of a community of nations and a shared international resource. For example, in the 1929 *Case Relating to the Territorial Jurisdiction of the International Commission of the River Oder*, the Permanent Court of International Justice (PCIJ) found that, according to the Treaty of Versailles, the Oder River was an international river. Specially, the PCIJ ruled that the Treaty of Versailles placed the Oder under the administration of an International Commission rather than a

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<sup>212</sup> Lake Lanoux Arbitration, para. 1-2.

<sup>213</sup> Faber Case, p. 457.

<sup>214</sup> Dispute Regarding Navigational and Related Rights (Costa Rica v. Nicar.), Judgement, 2009 I.C.J. Rep. 213 (July 13), <https://www.icj-cij.org/public/files/case-related/133/133-20090713-JUD-01-00-EN.pdf>.

single sovereign state.<sup>215</sup> This International Commission was to “define the sections of the river or its tributaries to which the international regime shall be applied.”<sup>216</sup> Furthermore, in its decision regarding the *Case Concerning Pulp Mills on the River Uruguay (Argentina v. Uruguay)*, commonly referred to as the *Pulp Mills Case*, the ICJ explicitly labeled the water of the Uruguay River “a shared resource.”<sup>217</sup>

These subsidiary sources of international law evidence the defining of water as a basis of a community and a shared resource. This definition of water can be clarified as the notion that water is a basis on which states can come together to form a community of common interests, as well as a resource that is shared across international boundaries.

#### Water as a Public, Social, and Economic Good

Water also holds a dual status as both a public/social good and an economic good. Both the social and economic characteristics of water are recognized in Article 18.8 of Agenda 21, which defines water as “a social and economic good.”<sup>218</sup> Regarding the definition of water as a public/social good, General Comment No. 15 defines water as “a public good fundamental for life and health” and calls for water to “be treated as a social and cultural good, and not primarily as an economic good.”<sup>219</sup> According to this definition, water is a resource that exists for the benefit and well-being of the public and should, *ipso facto*, be treated in a way that honors such a status.

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<sup>215</sup> According to paragraph 24 of the Judgement, this International Commission consisted of representatives from Poland, Germany, Great Britain, Czechoslovakia, France, Denmark and Sweden. *See: Case Relating to the Territorial Jurisdiction of the International Commission of the River Oder (U.K., Czechoslovakia, Den., Fr., Ger., Swed. v. Pol.)*, Judgement, 1929 P.C.I.J. (ser. A) No. 23, at para. 24 (Sept. 10), [hereinafter *Oder Case*] <https://www.internationalwaterlaw.org/cases/river-oder.html>.

<sup>216</sup> *Oder Case*, para.24.

<sup>217</sup> *Case Concerning Pulp Mills on the River Uruguay (Arg. v. Uru.)*, Judgement, 2010 I.C.J. Rep. 14 (April 20), [hereinafter *Pulp Mills Case*] <https://www.icj-cij.org/public/files/case-related/135/135-20100420-JUD-01-00-EN.pdf>.

<sup>218</sup> Agenda 21, art. 18.8.

<sup>219</sup> General Comment No. 15, para. 1.

The economic value of water was recognized by the ICJ in the aforementioned *Pulp Mills Case*. In deciding the case, the ICJ took care to consider the “Parties’ rights and needs to use the river for economic and commercial activities.”<sup>220</sup> In paragraph 244 of the decision, the ICJ also noted that the environmental degradation of the Uruguay River caused by the construction of pulp mills resulted “in important economic losses” because such construction “interfere[d] with some uses of water.”<sup>221</sup> Such an assessment gives credence to the status of water as an economic good possessing economic value. This definition of water is more explicitly articulated in the 1992 Dublin Principles. According to Principle 4, “water has an economic value in all its competing uses and should be recognized as an economic good.”<sup>222</sup> In its 1961 Resolution on the Use of International Non-Maritime Waters, the Institute of International Law noted its consideration of “the economic value of the use of waters.”<sup>223</sup>

Furthermore, in deciding *US – Softwood Lumber IV*, the WTO AB found that “there was no basis to exclude ‘tangible items—such as standing, unfelled trees—that are not both tradable as such and subject to tariff classification’ from the scope of the term ‘goods’ in [GATT] Article 1.1.”<sup>224</sup> Based on this interpretation of the term “good” within the framework of international trade law, it is reasonable to assume that the “potential[ly] independent and material character” of water causes it “to become a good in the understanding of WTO law,” i.e., an economic good with commercial and economic value.<sup>225</sup>

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<sup>220</sup> *Pulp Mills Case*, para. 175.

<sup>221</sup> *Pulp Mills Case*, para. 244.

<sup>222</sup> Dublin Principles, Principle No. 4

<sup>223</sup> Institute of International Law, “Resolution on the Use of International Non-Maritime Waters,” Sept. 1961, [http://www.hlrn.org/img/documents/Resolution\\_Salzburg1961.pdf](http://www.hlrn.org/img/documents/Resolution_Salzburg1961.pdf).

<sup>224</sup> World Trade Organization, ed., “E. Natural Resources, International Cooperation and Trade Regulation,” in *World Trade Report 2010: Trade in Natural Resources*, World Trade Report 2010 (Geneva: World Trade Organization, 2010), 160–99, [https://www.wto.org/English/res\\_e/booksp\\_e/anrep\\_e/wtr10-2e\\_e.pdf](https://www.wto.org/English/res_e/booksp_e/anrep_e/wtr10-2e_e.pdf).

<sup>225</sup> Szwedó, *Cross-Border Water Trade*, 127.



This review corroborates the defining of water as an economic good, a definition that can be described in sum as the notion that water is a resource with both economic value and competing uses and should, *ipso facto*, be treated in a way that honors such a status.

#### Water as an Explicitly Non-Economic Good

Finally, it is also important to note that water has also been explicitly defined as a non-economic good. In the 1993 Canada-United States-Mexico Declaration on Water Resources and the NAFTA, referred to commonly as the Joint Statement, the governments of Canada, United States, and Mexico agreed that “water in its natural state is not covered by the NAFTA, the [free trade agreement], the GATT, or any other trade agreement.”<sup>226</sup> According to the Joint Statement, “lakes, rivers, or aquifers are simply not goods or products, any more than are the fish swimming in them or the oil and gas trapped under them.”<sup>227</sup> In 2000, the International Joint Commission (IJC), which serves as the bilateral dispute resolution venue for the parties of the 1909 Boundary Waters Treaty between the United States and Canada, issued its final report assessing whether the waters of the Great Lakes fell with the jurisdiction of NAFTA and/or WTO agreements. The IJC found that “it is unlikely that water in its natural state is included within the scope of any of these trade agreements since it is not a product or good.”<sup>228</sup>

Canada recently reaffirmed the status of natural fresh water as a non-economic good in a side letter to the Agreement between the United States, the United Mexican States, and Canada (USMCA) regarding natural water resources. In the letter, the governments of the United States and Canada agreed that “unless water, in any form, has entered into commerce and become a good or product, it is not covered by the provisions of the” USMCA and that nothing in the USMCA

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<sup>226</sup> Johansen, “Bulk Water Removals, Water Exports and the NAFTA,” at “International Trade Considerations.”

<sup>227</sup> Johansen, at “Canada-United States-Mexico Declaration on Water Resources and the NAFTA.”

<sup>228</sup> Paul Stanton Kibel, “Grasp on Water: A Natural Resource That Eludes NAFTA’s Notion of Investment,” *Ecology Law Quarterly* 34, no. 2 (2007): 655–72.

“would oblige a Party to exploit its water for commercial use, including its withdrawal, extraction, or diversion for export in bulk.”<sup>229</sup>

This review of significant texts relating to the use and management of water resources shows how water can also be defined explicitly as a non-economic good. According to this definition, water is a resource that, regardless of its status as a public or social good, is not an economic good in its natural form.

### **Section 2.2.3: Discussion**

Through my analysis of primary and subsidiary sources of international law and other significant texts, I was able to identify various definitions of water employed and recognized by international actors. In so doing, I illustrated the immensely wide range of definitions applied to water. These definitions are summarized in Table 3. The multiplicity of definitions I identified complexifies the notion of how water is understood and treated at the international level by water users with international agency, including states engaged in international bulk water trade. The analysis I presented in this chapter demonstrates that, although debates regarding bulk water trade focus on the ostensible irreconcilability of treating water as an economic good and respecting its special status,<sup>230</sup> there is in fact a multitude of other definitions of water that ought to be accounted for when discussing such trade.

My analysis, however, does not simply demonstrate that water has *multiple* definitions; perhaps more significantly, it also illustrates that varying definitions can be applied *simultaneously* to water. The definitions of water I found in UN resolutions, international treaties and conventions,

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<sup>229</sup> Robert E. Lighthizer to Chrystia Freeland, Nov. 30, 2018, in “CA-US Side Letter on Natural Water Resources, Agreement between the United States of America, the United Mexican States, and Canada,” [https://ustr.gov/sites/default/files/files/agreements/FTA/USMCA/Text/CA-US\\_Side\\_Letter\\_on\\_Natural\\_Water\\_Resources.pdf](https://ustr.gov/sites/default/files/files/agreements/FTA/USMCA/Text/CA-US_Side_Letter_on_Natural_Water_Resources.pdf)

<sup>230</sup> I define what I mean when referring to water’s special status in Chapter 1.1.

international action plans and agendas, and precedents set by the ICJ, PCIJ, and international arbitration venues do not exist in isolation. Many countries simultaneously subscribe to the principles espoused by these various international legal sources and significant texts, if not to the actual provisions contained within them themselves. In so doing, countries also simultaneously recognize the multiplicity of water's definitions, which reflect different elements of water's characteristics, uses, and services, to at least some degree.

The notion that multiple definitions can *simultaneously* be applied to water is unequivocally recognized in the 1957 decision of the Arbitration Tribunal in the *Lake Lanoux Arbitration*. According to the Arbitration Tribunal, water can be an object of value, as in the case of determining monetary restitution, and still retain "its qualities in regard to human needs."<sup>231</sup> Water, therefore, can simultaneously be a resource with a certain quantifiable value, such as in the context of determining damages or payments for trade, and retain its other recognized definitions, including its status as an essential resource to which all humans have a right.

Recognizing this fact, the effectuation of a framework for bulk water trade at the international level ought to consequently address the spectrum of water's definitions in order to accurately account for the principles and obligations state parties subscribe to in their relations with one another concerning water resources. From another perspective, water's various definitions ought to inform the crafting of such a framework in order to effectively regulate the economic management and trade of water with respect for water's various characteristics, uses, and services.

### *Chapter 2.3: Case Studies Analyses and Discussion*

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<sup>231</sup> Lake Lanoux Arbitration, paras. 8 and 22.

The preceding chapter demonstrated the vast spectrum of conceptualizations regarding what water is and how it is defined. The purpose of this chapter is to assess how water and all its various definitions “fit” into international trade. This chapter examines the three philosophies of bulk water trade first introduced in Chapter 2.1. It also addresses a fourth philosophy, Philosophy 4, which I briefly introduced in Section 2.1.5 and will elaborate on later in this chapter. Even though it falls outside the scope of my definition of bulk water trade, I chose to include Philosophy 4 in my analysis because it presents an alternative means by which countries can still externally obtain and transfer water by exporting and importing it *without* subjecting it to economic valuation or appraisal.

Table 4, which is an extended version of Table 2 from Chapter 2.1, summarizes all four philosophies. The first three philosophies (Philosophies 1-3) presented in Table 4 reflect the various approaches to the trade and transfer of water represented in the IBWTB.<sup>232</sup>

Table 4

<b>Water Trade Approach/Philosophy</b>	<b>Description of Approach/Philosophy</b>	<b>Associated Case Study/Studies (Importer/Exporter)</b>
Monetary Approach (Philosophy 1)	Water is treated as the object of trade relations and assigned a set monetary value. Water is exchanged for payment based on agreed-upon terms between exporting and importing parties that were/are neither prompted nor restricted by temporary circumstances regarding the availability of water resources.	<ul style="list-style-type: none"> <li>• Singapore/Johor, Malaysia</li> </ul>
Limited Monetary Approach (Philosophy 2)	Water is treated as the object of trade relations and assigned a set monetary value; however, the terms of trade reflect exceptional circumstances that underscore water’s status as a non-substitutable essential resource. The terms of trade are also short-term and limited to satisfying a temporary demand.	<ul style="list-style-type: none"> <li>• Barcelona, Spain/France</li> </ul>
Barter Approach (Philosophy 3)	Water resources are exchanged not for money but for other goods or services. As such, this exchange involves the barter trade of water rather than direct trade of water for payment. Such trade nevertheless	<ul style="list-style-type: none"> <li>• Jordan/Syria</li> </ul>

<sup>232</sup> Based on my analysis of the instances using limited available information.

	still involves the valuation and appraisal of water, even though its value is expressed in terms other than monetary payment.	
Proxy Approach (Philosophy 4)*	The price associated with the international export and import of water resources reflects something other than the economic value of the water being traded. Although water is still the actual thing being transferred between parties, the accompanying terms of payment are not reflective of its value. Rather, the terms of payment assign a price to water-related objects/services, such as maintenance costs, operational costs, etc.	<ul style="list-style-type: none"> <li>• Singapore/Johor, Malaysia</li> <li>• South Africa/Lesotho</li> <li>• Gorizia, Italy/Slovenia</li> </ul>

In what follows, I discuss various case studies of bulk water trade as illustrations of the philosophies that comprise my typology of water trade approaches. I introduced these case studies and justified their selection in Chapter 1.3. Given the uncertainty regarding the application of GATT/WTO law to international bulk water trade, countries engaged in such trade, such as those named in the case studies below, have established their own practices and rules for the export and import of water as an object of trade in its own right. Studying these cases and the water trade philosophies they instantiate could help uncover insights that eventually inform the development of a legal framework for the effective regulation of such trade at the international level.

### **Section 2.3.1: Philosophies and Associated Case Studies**

#### The Monetary Approach (Philosophy 1)

Parties participating in bulk water trade according to Philosophy 1 treat water as the object of their trade relations and assigned it a monetary value. Thus, such parties can be said to take a “monetary approach” to water trade. In the context of such trade relations, water is exchanged for monetary payment based on terms that were/are neither prompted nor restricted by temporary

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\* Philosophy 4 is not reflected in the IBWTB because it addresses a proxy approach to the trade of water that relaxes the requirement of the valuation or appraisal of water, which is a significant element of my definition of bulk water trade. Nevertheless, Philosophy 4 is included in this analysis because it presents a form of water export and import that bypasses the treatment of water as an economic good while still allowing parties to externally obtain and transfer water resources.

circumstances regarding water availability. Based on accessible information, there are 13 instances of bulk water trade in the IBWTB that are classified as Philosophy 1. One such instance is the trade of water between Singapore and the Malaysian state of Johor (Johor).<sup>233</sup>

Singapore has obtained untreated water from Johor since the early twentieth century. In 1927, His Highness the Sultan and Sovereign Ruler of the State and Territories of Johore and the Municipal Commissioners of the Town of Singapore signed the Agreement as to Certain Water Rights in Johore (the 1927 agreement), which is the first of four agreements concerning water relations between Singapore and Johor. According to the terms of the 1927 agreement, Singapore leased land on the banks of the Johor River from the Sultanate of Johor.<sup>234</sup> Singapore used this land to maintain infrastructure necessary “for the storage and redirection of water” from the Johor River.<sup>235</sup> Furthermore, per the terms of the agreement, Johor was to obtain 800,000 gallons of *treated* water a day from Singapore at a rate of 25 cents per 1,000 gallons.<sup>236</sup>

Importantly, the 1927 agreement did not call “for direct payments for the water [transferred out of Johor] itself;” rather, it required Singapore to pay for the land and the construction and maintenance of any and all infrastructure it used to withdraw and transport water from the river.<sup>237</sup> For reasons that will be elaborated on later, these terms are more reflective of the proxy approach to water trade encompassed by Philosophy 4. As such, I analyze the terms of the 1927 agreement, which are no longer in effect, in more detail in my discussion of Philosophy 4.<sup>238</sup>

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<sup>233</sup> The selection of the instance of bulk water trade between Singapore and Johor as a case study was defended in Chapter 1.3.

<sup>234</sup> Valerie Chew, “Singapore-Malaysia Water Agreements,” A Singapore Government Agency Website, Singapore Infopedia, accessed February 24, 2021, [https://eresources.nlb.gov.sg/infopedia/articles/SIP\\_1533\\_2009-06-23.html](https://eresources.nlb.gov.sg/infopedia/articles/SIP_1533_2009-06-23.html).

<sup>235</sup> Szwedo, *Cross-Border Water Trade*, 168.

<sup>236</sup> The 1927 Agreement, art. 24.

<sup>237</sup> Szwedo, *Cross-Border Water Trade*, 168.

<sup>238</sup> Chew, “Singapore-Malaysia Water Agreements.”

Although water is not explicitly priced in the 1927 agreement, subsequent agreements between Johor and Singapore *do include* a pricing scheme for untreated, unbottled fresh water. Similar to the 1927 agreement, the 1961 Tebrau and Scudai Rivers Water Agreement between the Johore State Government and the City Council of Singapore (the 1961 agreement) provides for the lease of land by Singapore from Johor for the purposes of constructing, operating, and maintaining infrastructure required for the withdrawal and transport of water. Such infrastructure includes pipes used to transport water from the Johor River Basin to Singapore. The export of water from Johor to Singapore, as established by the 1961 agreement, is depicted in Image 2 below.<sup>239</sup>



Source: PUB, Singapore's National Water Agency ©<sup>240</sup>

<sup>239</sup> The provision that the importing party is responsible for the transport of water from the source in the exporting country is not part of the more general approach to water trade represented by Philosophy 1. This is a unique attribute of the trade between Singapore and Johor. Other bulk water trade instances characterized as Philosophy 1 may also encompass such an arrangement or may involve the transfer of water out of the exporting country by the country of export itself, such as in the case of water trade between Turkey and Northern Cyprus, or by a private company, such as in the case of water trade between New Zealand and Japan.

<sup>240</sup> PUB, Singapore's National Water Agency, *Imported Water*, image/png, 1200px, PUB, Singapore's National Water Agency, online, <https://www.pub.gov.sg/watersupply/founationaltaps/importedwater>. Copyright © PUB, Singapore's National Water Agency, reprinted by permission of PUB, Singapore's National Water Agency, <https://www.pub.gov.sg/>.

Despite these similarities, the 1961 agreement significantly differs from the 1927 agreement in that it required Singapore to pay the Government of Johor three cents “for every 1,000 gallons of water” withdrawn “from the State of Johore.”<sup>241</sup> Singapore was also to supply Johor daily with treated water. The amount of treated water supplied was capped at a maximum of “12 percent of the total quantity of water supplied to Singapore” from Johor on any given day and a minimum of four million gallons.<sup>242</sup> The price of the treated water from Singapore was set at “50 cents for every 1,000 gallons of pure water;<sup>243</sup> however, in the event that Singapore had to supply Johor with raw, untreated water in place of treated water, the price of that water, according to paragraph 16(iii), was set at “25 cents for every 1,000 gallons.”<sup>244</sup> The terms of the 1961 agreement expired in 2011 and were not renewed.<sup>245</sup>

In 1962, the City Council of Singapore and the Government of Johor signed the Johore River Water Agreement (the 1962 agreement). The agreement preserved the 1961 provisions regarding the price of untreated, unbottled water imported by Singapore. It slightly altered the amount of water Singapore was able to withdraw and import from Johor and the terms regarding the export of treated water from Singapore to Johor.<sup>246</sup> The agreement remains valid until 2061.<sup>247</sup>

In 1990, Singapore and Johor signed the Agreement Between the Government of the State of Johor and the Public Utilities Board of the Republic of Singapore (the 1990 agreement). This

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<sup>241</sup> Tebrau and Scudai Rivers Water Agreement between the Johore State Government and the City Council of Singapore and Its Successors, Sept. 1, 1961, (Vol. 75) *National Library Board of Singapore*. (Singapore: [s.n], cols. 2607–2608). (Call no.: RSING 328.5957 SIN), [hereinafter the 1961 Agreement] <https://sprs.parl.gov.sg/search/search/download?value=PDFs/2003/20030125/20030125-HA-0752605.pdf>.

<sup>242</sup> The 1961 Agreement, para. 14.

<sup>243</sup> The 1961 Agreement, para. 16ii.

<sup>244</sup> 1961 Agreement, para. 16iii.

<sup>245</sup> Chew, “Singapore-Malaysia Water Agreements.”

<sup>246</sup> Johore River Water Agreement between the Government of the State of Johore and the City Council of the State of Singapore and Its Successors, Sept. 29, 1962, (Vol. 75) *National Library Board of Singapore*. (Singapore: [s.n], cols. 2645–2648). (Call no.: RSING 328.5957 SIN), [hereinafter the 1962 Agreement] <https://sprs.parl.gov.sg/search/search/download?value=PDFs/2003/20030125/20030125-HA-0752645.pdf>.

<sup>247</sup> Chew, “Singapore-Malaysia Water Agreements.”



agreement addressed Singapore's construction of the Linggiu Dam across the Johor River on Malaysian land. Based on the terms of the agreement, Singapore was to pay for the land it used in the construction of the dam and could purchase treated water generated by the dam from Johor.<sup>248</sup> The 1990 agreement supplements—but does not substitute—the 1962 agreement.<sup>249</sup>

In the context of the water trade between Singapore and Johor, particularly according to the provisions of the 1962 agreement, untreated, unbottled water is assigned a particular price and transported from one country into another according to terms that were and are neither prompted nor restricted by temporary circumstances regarding the availability of water resources in either party (e.g., a water supply shortage or natural drought). Like other cases of trade classified as Philosophy 1, the pricing of the water resources in question is unequivocally associated with the raw water itself. This is especially true in this particular case; since Singapore owns the infrastructure for the withdrawal and transport of the water it imports, the price it pays for that water applies purely to the water itself and not any form of water service.

The agreements governing the trade of water between Singapore and Johor also explicitly differentiate between raw water and pure water, noting that Singapore is to pay Johor for the extraction of raw, untreated water, and that it is to provide Johor with a certain amount of pure, treated water for a *separate* pre-determined price.<sup>250</sup> This strict distinction emphasizes the application of a set monetary value to raw water in its natural, untreated form.

In Section 1.1.4, I defined the treatment of water as an economic good as the act of agreeing to represent water's value in a way that allows it to be exchanged between parties interested in

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<sup>248</sup> Agreement between the Government of the State of Johor and the Public Utilities Board of the Republic of Singapore, Nov. 24, 1990. (Vol. 75) *National Library Board of Singapore*. (Singapore: [s.n], cols. 2667–2668). (Call no.: RSING 328.5957 SIN), [hereinafter the 1990 Agreement]  
<https://sprs.parl.gov.sg/search/search/download?value=PDFs/2003/20030125/20030125-HA-0752665.pdf>.

<sup>249</sup> Chew, "Singapore-Malaysia Water Agreements."

<sup>250</sup> For example, *See*: the 1961 Agreement, paras.14 and 16.

obtaining and transferring water according to set terms. By explicitly agreeing to export and import water resources across international borders as a means of obtaining and transferring water and to represent the value of that water in the form of a monetary price, Singapore and Johor treat water as an economic good in the context of their bulk water trade relations.

Such treatment of water as an economic good, however, is not done to the exclusion of water's other statuses and definitions. For example, according to paragraph 13 of the 1961 agreement, Singapore is to ensure "that the flow of the Tabrau and Soudai Rivers," from which it is extracting water for import purposes, "shall not be reduced to such an extent" that the resulting increase in salinity harms other users of the rivers.<sup>251</sup> Paragraph 10 of the 1962 agreement contains a similar provision.<sup>252</sup> Such provisions appear to emphasize water's definition as a shared resource and one that requires a degree of protection. The presence of such provisions in these later agreements is significant because both agreements also apply water pricing schemes to the trade of water as the object of trade in its own right. Therefore, per the terms of the 1961 and 1962 agreements, it is understood that water is recognized as *not only* an economic good with a discernable economic value, *but also* a shared resource that requires protection.

Additionally of note is the fact that the prolonged water trade relationship between Singapore and Johor has continued, albeit according to altered terms, irrespective of temporary changes in domestic water resource availability. Singapore's natural geography makes water acquisition and management a perpetual challenge, not a temporary one.<sup>253</sup> Singapore is considered a "water-stressed country due to" consistently "insufficient [water] resources."<sup>254</sup>

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<sup>251</sup> The 1961 Agreement, para. 16.

<sup>252</sup> The 1962 Agreement, para. 10.

<sup>253</sup> Diane Segal, "Singapore's Water Trading with Malaysia and Alternatives" (John F. Kennedy School of Government Harvard University, 2004), <https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.365.2122&rep=rep1&type=pdf>.

<sup>254</sup> Segal, 7.

Therefore, its external obtainment of water resources is not triggered by the onset of temporary circumstances of water scarcity, but rather a consistent state of limited water resources.<sup>255</sup> Furthermore, per the terms of the agreements between Singapore and Johor, the water trade relations effectuated by these agreements are not set to expire for several decades and are not restricted by temporary circumstances regarding water availability.<sup>256</sup>

Not all water trade relations that fall into the category of Philosophy 1 are governed by the exact same provisions as the water trade between Singapore and Johor; however, all Philosophy 1 water trades share two key features. First, they all involve the explicit treatment of water as an economic good through the application of water pricing as a means of recognizing and representing its economic value.<sup>257</sup> Second, the establishment of trade relations was/are neither prompted nor restricted by temporary circumstances regarding water availability. These relations are “long-term” in the sense that they are meant to provide the importing party with water resources irrespective of acute water scarcity.

#### The Limited Monetary Approach (Philosophy 2)

Similar to Philosophy 1, the approach to water trade represented by Philosophy 2 involves the treatment of water as an economic good by recognizing its economic value through the application of a set monetary value to certain quantities of untreated, unbottled water and the exchange of that water for money between consenting trade parties. Water is thereby exported from one party and imported by another based on agreed-upon terms, just as it is according to Philosophy 1. Where Philosophy 2 differs from Philosophy 1, however, is the specific context

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<sup>255</sup> Segal, 7–8.

<sup>256</sup> For example, paragraph 1 of the 1962 agreement states that the terms of the agreement are to expire “ninety-nine years with effect from the date of the signing” and includes no provisions allowing for the prior termination of the agreement due to changes in a party’s natural access to water resources. *See*: the 1962 agreement, para. 1.

<sup>257</sup> Water pricing can be generally defined as the act of assigning a price to a given quantity of water. *See*: Paula Cecilia Soto Rios et al., “Explaining Water Pricing through a Water Security Lens,” *Water* 10, no. 9 (September 2018): 1173, <https://doi.org/10.3390/w10091173>.

within which trade relations were/are established and the implications of that context on the terms of trade.

Water trade deals executed in accordance with Philosophy 2 are temporally constrained based on the availability of water resources in the importing country. These trade relations occur within temporal confines defined by the need to address temporary water shortages. In this way, water trade is approached not as a means of a long-term general trade policy but rather as a measure to mitigate a situation of water stress. Therefore, whereas Philosophy 1 is referred to as the “monetary approach” to water trade, Philosophy 2 is referred to as the “*limited* monetary approach.” Based on available information, I classified 10 instances in the IBWTB as belonging to Philosophy 2. One of these instances is the importation of water by Barcelona, Spain from France during a drought in 2008.<sup>258</sup>

In 2008, Spain experienced its worst drought since precipitation records began over 60 years ago. During this time, water reservoirs in the Spanish city of Barcelona were only at 18 percent capacity.<sup>259</sup> If water levels in the reservoirs had dropped below 15 percent of normal levels, available water supplies would “no longer [be] deemed fit for drinking.”<sup>260</sup> Such circumstances would have put Barcelona residents in a dire situation, considering how essential water is for human life.<sup>261</sup> Therefore, in response to this emergency situation, the city implemented various

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<sup>258</sup> I was unable to gain access to primary source documents defining the terms of trade between Barcelona and France. My efforts included contacting the Catalanian water authority; however, I was unsuccessful in my pursuit to review the agreement defining the terms of the water trade. As such, I base my analysis of the water trade between Barcelona and France according to information found in news and media reports and scholarly works on the subject of water trade.

<sup>259</sup> David Shukman, “Ships Bring Water to Parched Barcelona,” *BBC*, May 13, 2008, <http://news.bbc.co.uk/2/hi/science/nature/7398012.stm>.

<sup>260</sup> Graham Keeley, “Barcelona Forced to Import Emergency Water,” *the Guardian*, May 14, 2008, <http://www.theguardian.com/world/2008/may/14/spain.water>.

<sup>261</sup> Molly Sargen, “Biological Roles of Water: Why Is Water Necessary for Life?,” *Science in the News* (blog), September 26, 2019, <http://sitn.hms.harvard.edu/uncategorized/2019/biological-roles-of-water-why-is-water-necessary-for-life/>.

water conservation measures, including turning off civic fountains, banning the filling of swimming pools, and introducing lessons on water saving methods and information into schools.<sup>262</sup> Additionally, as part of the city's plan to mitigate its water shortage, Barcelona selected to import water from Tarragona, Spain and Marseille, France. Specifically, Barcelona paid a total of 22 million Euros for six shiploads of about 28 million liters of water each. These ships were to supply the city with fresh water once a month for three months.<sup>263</sup>

In this instance of water export from France to Barcelona, water was given a set price, but the trade relations were only temporary and established to address a critical shortage of water that threatened human well-being but was eventually rectified. These terms of trade were not established as long-term trade relations for meeting domestic water demands. Water trades executed according to Philosophy 2, therefore, not only treat water as an economic good, with a recognized economic value represented in the form of a monetary price (just as it is according to Philosophy 1), but also underscore water's status as an essential, non-substitutable resource.<sup>264</sup> Regarding the latter point, in the case of trade between Barcelona and France, Barcelona could not substitute water with something else in order to mitigate its water shortage in the same way a country facing an oil shortage would be able to import natural gas or introduce more aggressive renewable energy initiatives. Although Barcelona could have hypothetically pursued desalination, the construction of desalination facilities requires immense time and resources. Therefore, desalination would not have satisfied the needs of residents already suffering from an acute lack

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<sup>262</sup> Keeley, "Barcelona Forced to Import Emergency Water."

<sup>263</sup> Keeley, "Barcelona Forced to Import Emergency Water"; Shukman, "Ships Bring Water to Parched Barcelona."

<sup>264</sup> Peter van der Zaag and Hubert H.G. Savenije, "Water as an Economic Good: The Value of Pricing and the Failure of Markets," Value of Water Research Report Series (Delft, the Netherlands: UNESCO-IHE Institute for Water Education, July 2006), 10–11, [https://www.waterfootprint.org/media/downloads/Report\\_19\\_Water\\_as\\_an\\_Econ\\_Good.pdf](https://www.waterfootprint.org/media/downloads/Report_19_Water_as_an_Econ_Good.pdf).

of water.<sup>265</sup> Barcelona addressed its acute and temporary water shortage instead by importing the essential resource from other parts of Spain (i.e., intranational bulk water trade) and France (i.e., international bulk water trade), thereby making water resources available to residents in a comparatively shorter timeframe.<sup>266</sup>

Not all parties engaged in water trade relations classified as Philosophy 2 experience the same circumstances as those seen in Barcelona in 2008; however, all Philosophy 2 relations are characterized by two common features. First, they all involve the explicit treatment of water as an economic good by using water pricing to recognize and represent its economic value. Second, all instances subscribing to a Philosophy 2 approach to water trade are prompted and restricted by temporary circumstances regarding water availability. As such, bulk water trade relations representative of Philosophy 2 are characterized by a desire to mitigate temporary water shortages.

### The Barter Approach (Philosophy 3)

Unlike the approaches represented by Philosophies 1 and 2, the approach to water trade encompassed by Philosophy 3 *does not* involve assigning a monetary value to the water resources serving as the object of trade relations. Instead, a set quantity of water exported from one country and imported by another is valued based on the identification of a good<sup>267</sup> or service deemed to represent the value of the water being traded. This approach to water trade is akin to a barter exchange of water resources and is therefore referred to as the “barter approach” to water trade.

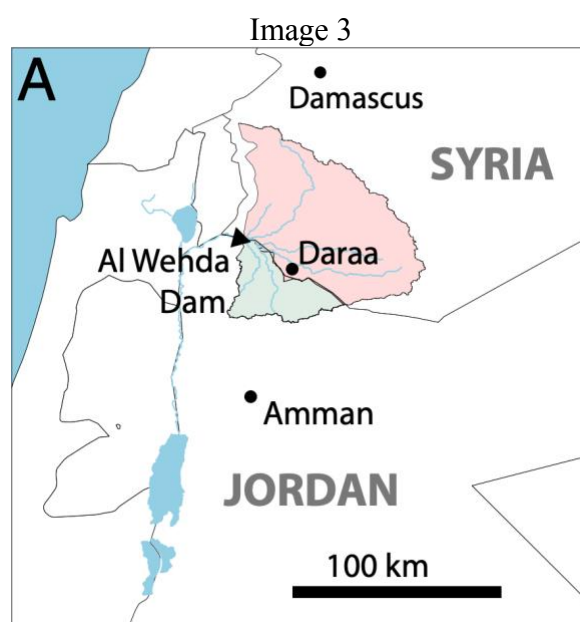
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<sup>265</sup> Head Tom, “Cape Town Water Crisis: Why Desalination Can’t Provide Water Overnight,” *The South African*, September 10, 2017, <https://www.thesouthafrican.com/news/cape-town-water-crisis-desalination-issues/>; Henry Fountain and Jamie McGregor Smith, “The World Can Make More Water From the Sea, but at What Cost?,” *The New York Times*, October 22, 2019, sec. Climate, <https://www.nytimes.com/2019/10/22/climate/desalination-water-climate-change.html>.

<sup>266</sup> Keeley, “Barcelona Forced to Import Emergency Water.”

<sup>267</sup> Here, I use the term ‘good’ to refer to economic goods, i.e., objects with competing uses and recognized economic value. These do not have to be recognized goods under the terms of the GATT.

Based on the information I was able to review, I found four instances of bulk water trade representative of Philosophy 3. This includes the water trade between Jordan and Syria. In 1953, Jordan and Syria signed the Agreement between the Republic of Syria and the Hashemite Kingdom of Jordan Concerning the Utilization of the Yarmouk Waters (the 1953 agreement).<sup>268</sup> The agreement concerns the utilization of the water in the reservoir of the Maqarin Dam, which is known today as the Al-Wehda Dam.<sup>269</sup> The location of the dam on the border between Syria and Jordan is shown in Image 3 below. The dam also serves as an electricity generating station.<sup>270</sup>



Source: Müller et al. ©<sup>271</sup>

<sup>268</sup> Agreement between the Republic of Syria and the Hashemite Kingdom of Jordan Concerning the Utilization of the Yarmouk Waters, June 4, 1953, 184 U.N.T.S. 23, [hereinafter the 1953 Agreement] <https://treaties.un.org/doc/Publication/UNTS/Volume%20184/volume-184-I-2437-English.pdf>.

<sup>269</sup> “Maqarin Dam” is the name used in the agreement between Jordan and Syria. The agreement provisions I cite refer to the installation in question as the Maqarin Dam. Therefore, in order to avoid confusion, I use the dam’s original name in my discussion of the case study, even though it is called the Al-Wehda Dam today. *See*: Hashemite Kingdom of Jordan, Ministry of Water & Irrigation, “Reporting on the Global SDG Indicator 6.5.2, Hashemite Kingdom of Jordan,” Reporting on the Global SDG Indicator 6.5.2 (Geneva: UN Economic Commission for Europe, June 11, 2017), [https://unece.org/fileadmin/DAM/env/water/activities/Reporting\\_convention/All\\_countries/JORDAN\\_Reporting\\_SDG652\\_final\\_11.06.2017.pdf](https://unece.org/fileadmin/DAM/env/water/activities/Reporting_convention/All_countries/JORDAN_Reporting_SDG652_final_11.06.2017.pdf).

<sup>270</sup> The 1953 Agreement, arts. 1(f) and 2.

<sup>271</sup> Marc François Müller et al., “Impact of the Syrian Refugee Crisis on Land Use and Transboundary Freshwater Resources,” *Proceedings of the National Academy of Sciences*, November 30, 2016, 201614342, <https://doi.org/10.1073/pnas.1614342113>. Copyright © Proceedings of the National Academy of Sciences, reprinted by permission of Proceedings of the National Academy of Sciences, <https://www.pnas.org/>.

Per the terms of Article 8 of the 1953 agreement, Syria retained the right to use “the waters of all springs welling up within its territory in the basin of the Yarmuk and its tributaries,” as well as the “water from the river and its tributaries” below the Maqarin Dam.<sup>272</sup> According to Article 8(a), however, Syria relinquished its rights to the water that filled the dam’s reservoir below the 250-meter level.<sup>273</sup> The 1953 agreement granted Jordan “the right to use the overflow from the reservoir and joint generating station.”<sup>274</sup> In exchange for ceding its rights to the water in the reservoir, Syria agreed to receive 75 percent of the electric power generated by the Maqarin power station.<sup>275</sup> The other 25 percent was allocated to Jordan, which also independently bore the entire cost of preliminary and final studies regarding the installation of the dam and 95 percent of the cost of its construction.<sup>276</sup>

According to the 1953 agreement, water is moved out of its natural watercourse through the creation of the Maqarin reservoir. That water is then transported into Jordan via irrigation canals and used for “the irrigation of the Jordanian lands and other Jordanian schemes.”<sup>277</sup> In exchange for Jordan’s importation of reservoir water, which is filled by the waters of Syrian rivers and to which Syria had a sovereign right prior to the imposition of the agreement’s restrictions, Syria was to receive a percentage of the electricity generated by the Maqarin power station disproportional to the amount it paid for the power station’s construction.<sup>278</sup> Per these terms, Syria effectively “traded” its water for electricity generated by the Maqarin Dam. As such, these terms represent the indirect barter of water resources for electricity between Jordan and Syria.

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<sup>272</sup> The 1953 Agreement, art. 8(a).

<sup>273</sup> The 1953 Agreement, art. 8(a).

<sup>274</sup> The 1953 Agreement, art. 8(b).

<sup>275</sup> The 1953 Agreement, art. 8(c).

<sup>276</sup> The 1953 Agreement, arts. 8(c) and 9.

<sup>277</sup> The 1953 Agreement, art. 8(b).

<sup>278</sup> Jordan paid for nearly all the power station’s construction costs. *See*: The 1953 Agreement, arts. 8(c) and 9.



Despite the successful conclusion of the 1953 agreement, the plans it laid out concerning the exchange of reservoir water for electricity were initially abandoned due to protests from Israel. In 1987, however, Syria and Jordan signed the Agreement Concerning the Utilization of the Yarmuk Waters (the 1987 agreement). This agreement revived the original plans of the Maqarin Dam project, which was ultimately successfully constructed.<sup>279</sup> Article 7 of the 1987 agreement preserved the terms laid out in Articles 8 and 9 of the original 1953 agreement addressing the indirect exchange of water in the reservoir of the Maqarin Dam for electricity.<sup>280</sup>

A key difference between the approach to water trade according to Philosophy 3 and those according to Philosophies 1 and 2 is the absence of a monetary price of water in the former. Nevertheless, water trades executed according to Philosophy 3 still treat water as an economic good. As I mentioned in Chapter 1.1, such treatment is accomplished when parties interested in obtaining and transferring water according to set terms agree to represent water's value in a way that enables such exchange. In relations conducted according to a Philosophy 3 approach, the representation of water's value is accomplished through the use of other goods/services as metrics of value rather than a water pricing scheme. This is the defining element of all instances classified as belonging to Philosophy 3.

For example, in the case of water trade between Syria and Jordan, Syria, upon agreeing to export water to Jordan, also agreed to assign that exported water a value represented as a percentage share of electricity. From Syria's perspective, therefore, water in the Maqarin reservoir was "worth" having access to 75 percent of the electricity generated by the Maqarin power station

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<sup>279</sup> Szwedo, *Cross-Border Water Trade*, 158; Müller et al., "Impact of the Syrian Refugee Crisis on Land Use and Transboundary Freshwater Resources," 14932.

<sup>280</sup> Agreement Concerning the Utilization of the Yarmuk Waters (with Annex) between the Syrian Arab Republic and Jordan, June 20, 1987, 1870 U.N.T.S. 285, at art. 7, <https://www.internationalwaterlaw.org/documents/regionaldocs/Jordan-Syria-1987.pdf>.

and having Jordan bear nearly all implementation and construction costs of the dam.<sup>281</sup> In this way, Jordan and Syria still engage in the obtainment and transfer of water according to set terms that include a mutually agreed-upon representation of the value of the water exchanged between them. The representation of this value is simply accomplished through the identification of other goods equal in value rather than through water pricing.

Furthermore, as Savenije and van der Zaag have demonstrated, the treatment of water as an economic good does not require the presence of water pricing; rather, such treatment is indicated by the “making [of] integrated choices” regarding how to best address “all human wants.”<sup>282</sup> By choosing to exchange water resources for other goods to fulfill demands for these resources/goods, countries engaged in bulk water trade according to Philosophy 3 participate in the making of “integrated choices” regarding water; thus, they treat water as an economic good without assigning it a monetary value. Additionally, according to Gleick, treating water as an economic good involves allocating it “across competing uses in a way that maximizes its value to society,” which does not necessarily require the application of a price to water.<sup>283</sup> Such allocation can take place in a market setting, within which water is exchanged for something determined to be of equal value; however, the thing it is exchanged for does not have to be money.<sup>284</sup> Thus, the presence of water pricing is not a necessary condition for water to be treated as an economic good. The process of valuing and appraising water through the barter exchange of water resources for other goods can therefore be said to preserve the realization of water’s economic value and its status as an economic good in the context of bulk water trade—absent a water pricing scheme.

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<sup>281</sup> The 1987 Agreement, art. 7.

<sup>282</sup> Savenije and van der Zaag, “Water as an Economic Good and Demand Management Paradigms with Pitfalls,” 99.

<sup>283</sup> Gleick, *The World’s Water: The Biennial Report on Freshwater Resources 2002-2003*, 3:37.

<sup>284</sup> Gleick, 3:37.

Not all parties engaged in water trade relations classified as Philosophy 3 use electricity to represent water's value or are governed by precisely the same conditions as those agreed to by Jordan and Syria. All Philosophy 3 relations, however, share three common features. First, they do not contain any set monetary prices assigned to the untreated, unbottled water that is being transferred between trade parties. Second, despite the absence of water pricing, the terms of trade still treat water as the object of trade in and of itself, meaning that the water being transferred across international boundaries is the object of valuation and appraisal by trade parties. Third, the value of the water being transferred is represented in the form of other goods or services and therefore traded through a form of barter exchange.

#### The Proxy Approach (Philosophy 4)

Water relations that occur in accordance with the principles of Philosophy 4 do not involve the valuation or appraisal of water resources that are externally obtained and transferred between participating parties. Therefore, such trade is not "bulk water trade," as it is defined in this work.<sup>285</sup> Water relations representative of Philosophy 4, however, still involve the external obtainment and transfer of water through its export- and importation in bulk across international borders. As such, these relations offer valuable insights regarding how countries can and do use the elements of international trade (i.e., exportation and importation) to obtain and transfer water resources beyond their borders.

According to Philosophy 4, water is removed from a particular natural water source and transferred in bulk across international boundaries; however, the prices named in the terms of such relations *do not reflect* the value of the water being transferred. Instead, these prices are associated with water-related objects/services, such as water delivery services or the maintenance of water-

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<sup>285</sup> The definition of bulk water trade is introduced in Chapter 1.1.

related infrastructure. These water-related objects/services are valued and appraised as “proxies” for the water resources being transferred between parties. As such, Philosophy 4 is referred to as the “proxy approach” to water trade.

Since the IBWTB does not include instances of Philosophy 4 water trades, I review three case studies of such trade here to give a more comprehensive assessment of this approach. First, I briefly revisit the water relations between Singapore and Johor. I then introduce the proxy water trade between South Africa and Lesotho before discussing the proxy water trade between the Italian commune of Gorizia and Slovenia.

#### 1) Singapore and Johor

As I mentioned above, the 1927 agreement between Singapore and Johor does not include a set price for water.<sup>286</sup> Instead, the pricing terms articulated in the agreement reflect the value of the land leased by Singapore from Johor for the construction, maintenance, and use of infrastructure involved in the storage and redirection of water imported from Johor. As such, per the terms of the 1927 agreement, although Singapore *did* import bulk water from Johor, the costs it paid to do so were nominally associated with something other than the actual water being transferred. Therefore, this aspect of the initial water trade relations between Singapore and Johor represents a Philosophy 4 approach to water trade, whereas the terms of the later agreements governing water trade between the two parties are more reflective of Philosophy 1.

Interestingly, the land lease payments made by Singapore to Johor were preserved in later agreements governing water trade relations between the two parties. Specifically, the 1961, 1962, and 1990 agreements include provisions for the leasing of land needed for the withdrawal and transfer of water similar to those found in the 1927 agreement.<sup>287</sup> Such terms are found in the later

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<sup>286</sup> Szwed, *Cross-Border Water Trade*, 168.

<sup>287</sup> See, *inter alia*: the 1961 Agreement, arts. 1-3; the 1962 Agreement, arts. 1-3; and the 1990 Agreement, arts. 4-5.

agreements alongside provisions for the valuation and appraisal of water resources through the application of a water pricing scheme.<sup>288</sup> Therefore, although the relations governed by the 1927 agreement strictly adhere to elements of the Philosophy 4 *proxy* approach to water trade, later agreements between Singapore and Johor demonstrate a transition to the application of a Philosophy 1 approach through the explicit treatment of water as an economic good via the implementation of a water pricing scheme.

It is also relevant to note that the initial proxy trade of water between Singapore and Johor was realized with consideration for water's diverse definitions. For example, according to paragraph 16 of the 1927 agreement, Johor is admonished from doing anything that would affect or interfere with the "purity of the water or the flow of water" that Singapore plans to extract.<sup>289</sup> Such provisions indicate the recognition of water's definition as a resource in need of protection. The incorporation of such provisions also demonstrates that parties can still recognize various conceptualizations or definitions of water while participating in the export and import of water resources according to Philosophy 4.

## 2) South Africa and Lesotho

In 1986, South Africa and Lesotho signed the Treaty on the Lesotho Highlands Water Project between the Government of the Kingdom of Lesotho and the Government of the Republic of South Africa (the 1986 treaty).<sup>290</sup> The treaty lays out the terms of the Lesotho Highlands Water Project (LHWP), which consists of "a network of dams and tunnels" used for the bulk transfer of fresh water from the Senqu/Orange River (Orange River) in the Lesotho Highlands to South

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<sup>288</sup> See, *inter alia*: the 1961 Agreement, art. 16(i) and the 1962 Agreement, art. 13.

<sup>289</sup> The 1927 Treaty, para. 16.

<sup>290</sup> The 1986 Treaty.

Africa.<sup>291</sup> Nominally, there are four phases to the project.<sup>292</sup> At present, only phase one, which involves the actual implementation of the project, is complete.<sup>293</sup> A separate agreement outlining the second phase of the project, which involves the construction of a 165-meter-high dam in Lesotho's Mokhotlong district, was signed in 2010; however, the effectuation of its terms continues to be delayed.<sup>294</sup> The first water deliveries of the project were made in late 1998.<sup>295</sup> Today, Lesotho exports about 780 million cubic meters of water to South Africa annually.<sup>296</sup>

In order to appreciate the proxy approach to the water trade laid out in the 1986 treaty, it is necessary to understand the geography of the Orange River. The waters of the river naturally flow from Lesotho's Dragon Mountains into South Africa, as seen in Image 4. Therefore, the water of the Orange River does eventually enter South Africa without any human manipulation; however, the natural course of the river bypasses South Africa's highly industrialized Gauteng Region, which encompasses Johannesburg. Thus, the objective of the LHWP is to divert the upstream waters of the Orange River within the territory of Lesotho using dams and tunnels in order to deliver the water to South Africa's Gauteng Region.<sup>297</sup>

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<sup>291</sup> Temmerman, *Bulk Fresh Water Resources and the GATT*, 2017, 55.

<sup>292</sup> Temmerman, 55.

<sup>293</sup> Szwedo, *Cross-Border Water Trade*, 177.

<sup>294</sup> Water Technology, "Lesotho Highlands Water Project," Water Technology, accessed February 27, 2021, <https://www.water-technology.net/projects/lesotho-highlands/>; Szwedo, *Cross-Border Water Trade*, 179.

<sup>295</sup> Gleick, *The World's Water: The Biennial Report on Freshwater Resources 1998-1999*, 1:99.

<sup>296</sup> gga\_ad, "Lesotho: Southern Africa's 'Water Engine,'" *GGA* (blog), February 16, 2018, <https://gga.org/lesotho-southern-africas-water-engine/>.

<sup>297</sup> Szwedo, *Cross-Border Water Trade*, 178–80; Gleick, *The World's Water: The Biennial Report on Freshwater Resources 1998-1999*, 1:93.

Image 4



Source: Philippe Rekacewicz et al. (Creative Commons License)<sup>298</sup>

Implementing such a diversion scheme, however, required the manipulation of water within the territory of Lesotho. In fact, over 90 percent of the construction necessary for the project is located in Lesotho.<sup>299</sup> In order to accomplish the goals of the project, South Africa agreed to pay Lesotho a “royalty” for the upstream water of the Orange River. This royalty is the price South Africa pays Lesotho for the ability to make water, which would otherwise naturally enter South Africa, available in a location that better aligns with South Africa’s interests and needs through the construction of large water projects on Lesotho’s territory. Thus, the royalty *does not* reflect the price of the water itself.<sup>300</sup> In addition to royalty payments, Article 10 of the treaty provides that South Africa bear the entire cost of the project’s construction. Lesotho, for its part, is required

<sup>298</sup> Philippe Rekacewicz, Emmanuelle Bournay, and UNEP/GRID-Arendal, *South Africa topographic map*, image/png, 550x468, GRID-Arendal, online, <https://www.grida.no/resources/5322>.

<sup>299</sup> Gleick, *The World’s Water: The Biennial Report on Freshwater Resources 1998-1999*, 1:93.

<sup>300</sup> Szwedo, *Cross-Border Water Trade*, 179, 182.

to pay for costs related to “implementation, operation, and maintenance of” the “generation of hydro-electric power in the Kingdom of Lesotho.”<sup>301</sup>

The sale of water is not mentioned anywhere in the 1986 treaty. Instead, the pricing terms presented in Article 12 of the treaty reflect the value of making water available in a specific location rather than introducing an entirely new means of water access through the importation of water.<sup>302</sup> Such pricing terms represent the valuation and appraisal of water-related objects/services that serve as “proxies” for the actual water being transferred between parties. Therefore, although water is still being transferred into South Africa from an external, international source using artificial means (e.g., dams and canals that remove water out of its natural course and flow), it is not the object of valuation and appraisal. Consequently, the relations between South Africa and Lesotho pertaining to the LHWP represent a Philosophy 4 proxy approach to water trade.

Also of note is that Article 15 of the 1986 treaty includes specific provisions regarding social and environmental considerations related to the LHWP and the diversion of water.<sup>303</sup> The inclusion of such provisions underscores water’s status as a critical part of the environment and a social resource necessary for ensuring human well-being. Furthermore, Article 16(17) provides that, in the event of a dispute regarding the LHWP, “international agreements entered into by both Parties” and “customary international law [that is] universally recognized or [has received] the assent of both Parties” shall apply “to the extent necessary for” the “interpretation or application” of the treaty.<sup>304</sup> Both South Africa and Lesotho are signatories of several of the agreements and covenants containing provisions regarding various definitions and statuses of water that were analyzed in Chapter 2.2. They are also both members of the UN and the UNHRC and would

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<sup>301</sup> The 1986 Treaty, art. 10.

<sup>302</sup> The 1986 Treaty, art. 12.

<sup>303</sup> The 1986 Treaty, art. 15.

<sup>304</sup> The 1986 Treaty, art. 16(17).



therefore likely recognize the UNGA and UNHRC resolutions regarding water's statuses as reflecting international legal customs in the management and use of water resources.<sup>305</sup>

Article 16(17) of the 1986 treaty also provides that, in the event of arbitration for the purposes of dispute resolution, “all other rules of law in force in both the Kingdom of Lesotho and the Republic of South Africa” can be used for the purposes of treaty “interpretation or application.”<sup>306</sup> This provision regarding common domestic legal principles is especially of note given the nature of the water law regimes in place in both South Africa and Lesotho.

The preamble of South Africa's 1998 National Water Act explicitly recognizes water as “a scarce and unevenly distributed national resource” that “belongs to all people” and underscores the importance of protecting and sustainability utilizing water resources.<sup>307</sup> According to Article 2 of the National Water Act, the purpose of the act is to protect the nation's water resources and manage them in a way that accounts for, *inter alia*, “basic human needs of present and future generations; ... equitable access to water; ... efficient, sustainable and beneficial use of water in the public interest; ... [the protection of] aquatic and associated ecosystems and their biological diversity; [and the need to reduce and prevent the] pollution and degradation of water resources.”<sup>308</sup>

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<sup>305</sup> Obed Asamoah, “The Legal Effect of Resolutions of the General Assembly,” *Columbia Journal of Transnational Law* 3 (1964 1963): 210; Stephen M. Schwebel, “The Effect of Resolutions of the U.N. General Assembly on Customary International Law,” *Proceedings of the Annual Meeting (American Society of International Law)* 73 (1979): 301–9; “Why Have Resolutions of the UN General Assembly If They Are Not Legally Binding?,” *E-International Relations* (blog), June 16, 2016, <https://www.e-ir.info/2016/06/16/why-have-resolutions-of-the-un-general-assembly-if-they-are-not-legally-binding/>; “Member States | United Nations,” accessed February 27, 2021, <https://www.un.org/en/member-states/>; “OHCHR | Lesotho Homepage,” accessed February 27, 2021, <https://www.ohchr.org/EN/Countries/AfricaRegion/Pages/LSIndex.aspx>; “OHCHR | OHCHR – South America Regional Office,” accessed February 27, 2021, <https://www.ohchr.org/EN/Countries/LACRegion/Pages/LatinAmericaSummary.aspx>.

<sup>306</sup> The 1986 Treaty, art. 16(17).

<sup>307</sup> National Water Act, vol. 398 Republic of South African Government Gazette No. 36 (1998), [hereinafter National Water Act] [http://www.energy.gov.za/files/policies/act\\_nationalwater36of1998.pdf](http://www.energy.gov.za/files/policies/act_nationalwater36of1998.pdf)

<sup>308</sup> National Water Act, art. 2.

Similar principles are found in Lesotho’s 2008 Water Act. Article 3 of the Water Act states that relevant government ministries and “water management institutions shall take into account and ... give effect to” a number of general water management and protection principles, including, *inter alia*, the “sustainable utilizations of water resources; intergenerational equity; integrated water resource management; [the] equitable distribution of water and sanitation services; ... [the] polluter pays principles; [and the] integration of the environmental and social issues into water resource management.”<sup>309</sup>

Additionally, according to Article 3 of South Africa’s 1998 National Water Act, the country’s water resources are held in public trust with the national government serving as “the public trustee of the nation’s water resources.”<sup>310</sup> Lesotho’s water law establishes similar principles entrusting water resources to the nation. According to Article 4 of Lesotho’s Water Act, water resources are “held in trust by the King on behalf of the” nation.<sup>311</sup> Of the two countries, only South Africa recognizes the human right to water.<sup>312</sup> The domestic water law provisions discussed above, however, demonstrate common legal principles in place that recognize various statuses of water. Since these legal principles are common to both parties, they are applicable to the “interpretation or application” of the 1986 treaty, which highlights water’s economic characteristics without necessarily treating it as an economic good.<sup>313</sup> The inclusion of common

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<sup>309</sup> Water Act, vol. 53 Lesotho Government Gazette No. 15, art. 15 (2008), <http://extwprlegs1.fao.org/docs/pdf/les139287.pdf>.

<sup>310</sup> National Water Act, art. 3.

<sup>311</sup> <http://extwprlegs1.fao.org/docs/pdf/les139287.pdf> article 4

<sup>312</sup> The human right to water is mentioned in Article 27 of South Africa’s 1996 constitution. *See*: Constitution of the Republic of South Africa art. 27, Act 108 of 1996, <https://www.gov.za/sites/default/files/images/a108-96.pdf>. Per the advice of *The Chicago Manual of Style*, this source is cited according to the South African legal citation style used for the South African constitution as provided by the foreign law database of Washington University in St. Louis School of Law. For more *see*: Washington University in St. Louis School of Law and Washington University Global Studies Law Review, “International Citation Manual,” Global Studies Law Review, accessed April 15, 2021, [https://openscholarship.wustl.edu/law\\_globalstudies/icm.html](https://openscholarship.wustl.edu/law_globalstudies/icm.html).

<sup>313</sup> The 1986 Treaty, art. 16(17).

domestic laws, such as the ones named above, into the provisions of the 1986 treaty demonstrates how states engaged in the export and import of water resources can still recognize water's various definitions.<sup>314</sup>

### 3) Gorizia and Slovenia

In the water relations between Singapore and Johor, pricing terms were applied to land and infrastructure used for water extraction and transport. In the water relations between South Africa and Lesotho, pricing terms reflect the valuation of making water available in a specific location and using the territory of another sovereign state to do so. In the water relations between the Italian commune of Gorizia and Slovenia, pricing terms are used to value and appraise water services. The 1947 Treaty of Peace with Italy (the 1947 treaty) ceded a portion of land held by Italy prior to and during World War II to Yugoslavia. This land transfer negatively impacted the ability of a particular northern Italian settlement, the Commune of Gorizia, to access water.<sup>315</sup> Therefore, Article 13 and Annex V of the 1947 treaty called for Yugoslavia, and today Slovenia, to export water from the “water supply installations at Fonte Fredda and Moncorona”<sup>316</sup> to Gorizia.<sup>317</sup> Image 5 shows the location of Gorizia, which is part of Italy's north-easternmost region of Friuli-Venezia Giulia, relative to Slovenia. At the time of the 1947 treaty's original signing, Slovenia was part of Yugoslavia; however, I refer to these water relations as involving Slovenia since they have continued into the present day despite the dissolution of Yugoslavia in 1991.<sup>318</sup>

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<sup>314</sup> The 1986 Treaty, art. 16(17).

<sup>315</sup> Szvedo, *Cross-Border Water Trade*, 138.

<sup>316</sup> Today, Moncorona is referred to as Kromberk, Slovenia. See: Google, *Komberg / Kromberk / Moncorona, Slovenia, Earth - Things to Do in Moncorona - Geody*, Satellite (Geody), accessed April 16, 2021, <https://www.geody.com/geopot.php?world=terra&ufi=-85976&alc=mnc>.

<sup>317</sup> Treaty of Peace with Italy, art. 13 and Annex 5.

<sup>318</sup> U.S. Department of State, Office of the Historian, “Milestones: 1989–1992 - Office of the Historian.”

Image 5



Source: Wikipedia Commons (Creative Commons License)<sup>319</sup>

According to paragraph 3 of Annex V of the 1947 treaty, the charges paid by Gorizia to Slovenia “for the water supplied to it...shall be based solely on the cost of operation and maintenance of the water supply system” and “new capital expenditures that may be required” for the realization of the provisions of the annex.<sup>320</sup> Per these terms, water is exported across international boundaries; however, the pricing associated with that exported water *does not* reflect the value of the water but rather the costs of managing it and operating the relevant water supply systems. Accordingly, the water trade between Gorizia and Slovenia represents a Philosophy 4 proxy approach to water trade.

All these examples of a Philosophy 4 proxy approach to water trade differ based on what is being priced in place of the water that is actually being transferred across borders; however, all three examples, and indeed all instances of proxy water trade represented by Philosophy 4 share three common features. First, they all involve the physical export and import of water across

<sup>319</sup> Lkel\_it, *Friuli-Venezia Giulia*, February 28, 2017, image/png, 827x740, Wikimedia Commons, online, [https://commons.wikimedia.org/wiki/File:Friuli-Venezia\\_Giulia\\_Voy\\_map.png](https://commons.wikimedia.org/wiki/File:Friuli-Venezia_Giulia_Voy_map.png).

<sup>320</sup> Treaty of Peace with Italy, Annex 5.

international boundaries, thereby allowing for the external obtainment and transfer of water resources. Second, they all involve pricing terms that apply to something other than the water resources actually being obtained and transferred by participating trade parties. Third, by bypassing the valuation and appraisal of water and failing to represent the value of the water resources being exchange between consenting trade parties through other means, such relations do not involve the treatment of water as an economic good. Therefore, trade relations governed according to Philosophy 4 represent an alternative, *proxy* approach through which countries can obtain and transfer water without necessarily treating it as an economic good.

### **Section 2.3.2: Discussion**

By analyzing the case studies discussed above, I was able to assess how water is treated in the context of bulk water trade. Specifically, I determined that water is treated as *an economic good* in the context of bulk water trade, as I define it in this work. I have shown that this conceptualization of water is discernible in the way water is valued and appraised by parties to such trade. I have also shown that the treatment of water as an economic good in the context of bulk water trade manifests in different ways based on varying approaches to water trade. I grouped these approaches into different philosophies. I also discussed a proxy approach to water trade that enables countries to engage in the export and import of water resources without valuing or appraising the actual water being transferred. Although this approach does not represent bulk water trade, *per se*, it nevertheless presents a means by which countries looking to obtain and transfer water resources externally could go about doing so.

Furthermore, I observed that some of water's other definitions discussed in Chapter 2.2 were present in a number of the selected case studies. For example, as I discussed above, water is recognized as both an economic good and a shared resource that requires a degree of protection

per the terms of the 1961 and 1962 water trade agreements between Singapore and Johor.<sup>321</sup> Additionally, the 1986 treaty between South Africa and Lesotho governing relations pertaining to the LHWP includes specific provisions regarding social and environmental considerations that emphasize water's definition as a critical part of the environment and social resource necessary for ensuring human well-being.<sup>322</sup> It also calls attention to the relevance and importance of certain definitions of water recognized within the scope of the parties' domestic water law regimes.<sup>323</sup> Although water is not treated as an economic good, *per se*, in the context of the LHWP treaty, due to the absence of a representation of water's value, it is still being exported and imported according to set terms agreed upon by participating parties. Similar provisions and considerations could theoretically be included in agreements governing bulk water trade relations between international parties, thereby enabling parties to balance the treatment of water as an economic good with the observance of water's other definitions.

Despite discernible differences between the bulk water trade philosophies I analyzed in this section, all four involve the external obtainment and transfer of water resources across international borders. As such, all four offer valuable insights regarding how international parties, i.e., countries, looking to import or export untreated freshwater resources could go about doing so—the unresolved status of the question regarding whether GATT/WTO principles apply to such trade notwithstanding. Even rules and provisions governing the relations according to the proxy philosophy could inform the development of future water trade relations. Specifically, the terms of such relations present an alternative option for obtaining water resources and underscore certain concerns that should be addressed in the establishment of both water trade relations between

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<sup>321</sup> The 1961 Agreement; the 1962 Agreement.

<sup>322</sup> The 1986 Treaty, art. 15.

<sup>323</sup> The 1986 Treaty, art. 16(17).

individual international parties and a broader legal framework for the regulation of such trade at the international level.

### *Chapter 2.4: Results, Findings, and Discussion*

In Chapter 1.1, I presented two research questions: 1) how do parties to international bulk water trade relations approach water as the object of such trade and 2) how can past and present instances of bulk water trade inform the development of a framework for the regulation of such trade at the international level? I employed the four-step methodology laid out in Chapter 1.2 to answer these questions. Each step of this methodology produced several significant findings.

#### **Section 2.4.1: Results and Findings Related to the IBWTB and Typology of Philosophies**

In order to answer my research questions, I first had to find actual instances of international bulk water trade to study and analyze. In attempting to find these instances, I noted the lack of a centralized source of information regarding bulk water trades. Realizing this, I decided to create one, which I called the IBWTB (see Annex 1). The IBWTB is the most comprehensive collection of executed international bulk water trade instances currently available. In addition to listing instances of bulk water trade, I also included several pieces of supplemental data relating to those instances in the IBWTB. A summary of results from the IBWTB is presented in Table 5, which is an extended version of Table 1 from Chapter 2.1.

Table 5

<b>Steps</b>	<b>Criteria for Review and Consideration</b>	<b>Results*</b>
Step 1: Produce an Initial List of Examples/References Based on a Literature Review	1) Established relevance and recognition as an example of bulk water trade, however broadly defined, in background literature and in works cited by that literature addressing one or more of the following topics: a) water pricing;	60+ Examples of or references to relations said to constitute “bulk water trade”

	b) water commodification/marketization; c) water trade; and/or d) water transfer	
Step 2: Filter the Initial List and Identify Instances	1) Successful execution 2) Transboundary trade 3) The valuation and/or appraisal of water 4) The exchange of unbottled, untreated water as an object of trade in its own right	42 Instances of executed international bulk water trades
Step 3: Collect Supplemental Data	1) Parties to the Trade 2) Status of the Trade 3) Date of Initiation 4) Method of Water Transport 5) Approach to Water Trade 6) Source	<ul style="list-style-type: none"> <li>• 11 Instances initiated pre-2000</li> <li>• 8 Instances initiated post-2000</li> <li>• 2 Instances initiated as needed</li> <li>• 10 Active instances</li> <li>• 12 Inactive instances</li> <li>• 6 Instances using pipes/pipelines</li> <li>• 16 Instances using a boat/barge/tanker/ship</li> <li>• 3 Instances using bags or flexi tanks</li> <li>• 3 Instances using other methods (i.e. aquifer, reservoir, etc.)</li> <li>• 13 Instances of Philosophy 1</li> <li>• 10 Instances of Philosophy 2</li> <li>• 4 Instances of Philosophy 3</li> </ul>
		*Based on limited available/accessible information

Through the creation of the IBWTB, I was able to identify 42 instances of international bulk water trade that fit the criteria defined in Chapter 2.1. Of those instances, I identified 11 that were initiated prior to the twenty-first century, eight during the twenty-first century, and two that are initiated as needed (i.e., depending on water needs). There are 17 cases for which I could not



find additional information regarding their dates of initiation. Based on my analysis of available information, the use of a boat, barge, tanker, and/or ship was the most common means of transporting water resources. This may be reflective of limited technological development or availability of water bag or pipe technology, cheaper costs due to comparatively lower input expenses (e.g., lower fuel costs compared to the costs of installing and maintaining pipeline infrastructure or investing in bag technology), or geographic constraints (e.g., there is a limit to how long and across what geographic conditions water pipelines can be built or bags for overseas transport can be used).<sup>324</sup> The “growth in technical possibilities” of “long-distance transportation involving specially adapted tankers, water bags, and pipelines” could alter the distribution of how often these methods are employed in future bulk water trades, depending on the rate of technological advancement and profitability associated with each.<sup>325</sup> The development and increasing profitability of “water bags for [the] long-distance transport of drinking water” in particular could play an important role in altering this distribution.<sup>326</sup>

The creation of the IBWTB was vital to the execution of the second step of my research process: the creation of a typology for different approaches to water trade. I analyzed the terms and features of bulk water trade instances in the IBWTB to gain an understanding of the approaches to water trade they represented. I then summarized the approaches I identified, which I called philosophies, into separate classifications based on common features. I then used these classifications and their distinguishing elements to create a typology of water trade approaches. This typology was presented in Tables 2 and 4.

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<sup>324</sup> Gleick, *The World's Water: The Biennial Report on Freshwater Resources 1998-1999*, 1:201; Davidge, “Water Exports”; Szwedo, *Cross-Border Water Trade*, 148 footnotes 84.

<sup>325</sup> Szwedo, *Cross-Border Water Trade*, 4.

<sup>326</sup> Szwedo, 324.

My ability to craft such a typology is itself a significant result. Specifically, it demonstrates the existence of 1) discernable variation across bulk water trade instances regarding the way parties to such trade engaged in it and 2) common features within instances that allow for the classification of instances according to a typology. Both of these observations were reinforced in my analysis of case studies and will be discussed in more detail as significant findings shortly.

Using the limited information I had available, I was able to identify three distinct water trade approaches employed by parties that have successfully engaged in bulk water trade. Through the course of discerning which examples of and references to water trade to exclude from the IBWTB, I also identified a fourth “proxy” philosophy. According to this proxy philosophy, which I labeled Philosophy 4 and discussed in Chapter 2.3, countries obtain and transfer water through the export- and importation of water resources while bypassing the actual valuation and appraisal of water.

Based on the application of my typology to the instances included in the IBWTB, most of the instances (for which I could find relevant information) were characterized by elements that reflected the approach to water trade represented by Philosophy 1. Per this approach, water is traded as an object of trade in its own right according to agreed-upon terms and assigned a set monetary price. This finding is significant because it suggests that, despite the variety of water trade approaches available to parties engaging in bulk water trade, parties chose the approach represented by Philosophy 1 more often than they do any other approach I identified. The weight of this finding, however, is constrained by the fact that there were 15 instances for which I could not find enough information to properly apply my typology.

#### **Section 2.4.2: Results and Findings Related to Water’s Definitions**

Upon presenting and applying my typology, I revisited the debate regarding the treatment of water as an economic good in light of its special status. In Chapter 2.2, I analyzed how water is “defined” within the context of various primary and subsidiary sources of international law and other significant texts relating to the use and management of water resources. This analysis led me to identify 14 different “definitions” of water recognized to varying degrees by the international community. I summarized these definitions, as well as example sources and texts within which they are articulated, in Table 3.

The definitions I identified cover a broad range of conceptualization regarding what water “is” based on its various characteristics, uses, and services, including, *inter alia*: its uniqueness as an essential resource for life; its relation to the larger natural environment; and its importance to economic activities such as trade and transportation. Despite the impressive range of definitions I identified, I realize that my analysis of sources of international law and significant texts was not exhaustive and that, as a result, I may have overlooked several additional definitions of water.

Based on my analysis of water’s definitions, I found that states not only apply several different definitions to water across various international legal regimes but that they may also apply these definitions *simultaneously*. This observation is significant to the realization of the goals of this research because it supports the notion that water can be treated as an economic resource, such as within the context of bulk water trade, while still retaining the characteristics that make up its special status (i.e., its conceptualization as a human right and unique and essential resource). The implications of this finding for my research questions will be discussed in more detail in the following section.

### **Section 2.4.3: Results and Findings Related to the Analysis of Bulk Water Trade Case Studies**

Using the typology of water trade approaches I created, I was able to identify a diverse selection of bulk water trade case studies. My review of these case studies led me to observe six significant findings. The first of these findings is that there is no standard way in which parties engage in international bulk water trade. Put differently, there is, at present, no uniform practice, or *framework*, for the international export and import of water as the object of trade relations in its own right. As I mentioned previously, this observation is perceptible through the very creation of a water trade approach typology; however, it is more concretely demonstrated through my analysis of bulk water trade case studies, which highlighted critical differences in the ways parties to such trade relations execute them. This observation also buttresses the significance of this work, which aimed to extract insights from past and present instances of bulk water trade that could inform the crafting of an international framework for such trade.

The second key finding, which I note in Section 2.3.2, is that water has been and is treated as an *economic good* in the scope of bulk water trade relations. Specifically, parties engaged in international bulk water trade, wherein water serves as the object of such trade, represent water's value in a way that allows it to be exchanged according to established and agreed-upon terms. In so doing, these parties treat water as an economic good with economic value, regardless of whether they subscribe to a Philosophy 1, 2, or 3 approach to water trade.

These two findings support the identification of a third significant finding. Specifically, my analysis of various water trade philosophies revealed that the aforementioned treatment of water as an economic good in the context of bulk water trade *is not uniform*. There exists no single, standard way parties to bulk water trade treat water as an economic good, even though their involvement in such relations does result *in some manifestation* of such treatment. This diversity in the treatment of water as an economic good is evident, for example, in the juxtaposition of water

trade relations between Singapore and Johor (per the terms of the 1962 agreement) and those between Jordan and Syria. In the former, water is treated as an economic good through the application of a set monetary price representing its value in a way that allows for its objectification as an item of trade in its own right. In the latter, water's value is represented in the form of another good, i.e., electricity; nevertheless, such representation of water's value still facilitates the trade of water between the consenting parties.

In addition to my findings regarding water's treatment as an economic good in the context of bulk water trade, I also found that such treatment is not realized to the exclusion of other definitions of water. Specifically, I was able to find references to and direct invocations of varying definitions of water identified in Chapter 2.2 within the context of bulk or proxy water trade relations. This finding, which I elaborated on in Section 2.3.2, indicates that parties can trade, or otherwise externally obtain and transfer, water while *simultaneously* recognizing water's non-economic definitions, including elements of its special status.

The fifth key finding is that, although there is no standard way in which parties engage in either international bulk or proxy water trade, instances of both kinds of trade can be classified as belonging to a specific philosophy based on common features. These common features, which were discussed in Chapter 2.3, are summarized in Table 6.

Table 6

<b>Approach and Associated Philosophy</b>	<b>Common Features</b>
Monetary Approach (Philosophy 1)	1) the explicit treatment of water as an economic good through the application of water pricing as a means of recognizing and representing its economic value and 2) the establishment of trade relations that were/are neither promoted nor restricted by temporary circumstances regarding water availability

Limited Monetary Approach (Philosophy 2)	<ol style="list-style-type: none"> <li>1) the explicit treatment of water as an economic good through the application of water pricing to recognize and represent its economic value and</li> <li>2) the establishment of trade relations promoted and/or restricted by temporary circumstances regarding water availability</li> </ol>
Barter Approach (Philosophy 3)	<ol style="list-style-type: none"> <li>1) the absence of any set monetary prices assigned to the untreated, unbottled water that is transferred between trade parties;</li> <li>2) terms of trade that focus on water as the object of trade in its own right, i.e., the object of valuation and appraisal by trade parties; and</li> <li>3) the use of other goods/services to represent the value of the water being transferred between trade parties</li> </ol>
Proxy Approach (Philosophy 4)	<ol style="list-style-type: none"> <li>1) the physical export and import of water across international boundaries that facilitates the external obtainment and transfer of water resources;</li> <li>2) pricing terms that apply to something other than the water resources actually being obtained and transferred by participating trade parties; and</li> <li>3) the absence of treating water as an economic good by failing to value and/or appraise the water transferred between parties through some other means</li> </ol>

In reading Table 6, instances classified as Philosophy 1, involve, at minimum, 1) explicitly treating water as an economic good through the application of water pricing as a means of recognizing and representing its value and 2) establishing trade relations that were/are neither promoted nor restricted by temporary circumstances regarding water availability. The same analysis applies to the other philosophies displayed in Table 6.

My analysis of the case study of water trade between Singapore and Johor resulted in a sixth and final finding: an instance of water trade or proxy water trade can transition between

philosophies as it develops overtime. The 1927 agreement between Singapore and Johor, which was the initial trade agreement governing the obtainment and transfer of water resources between the two parties, established terms of trade that fell squarely within Philosophy 4 for reasons discussed in the previous chapter. Later agreements concerning the obtainment and transfer of water between Singapore and Johor, such as the 1962 agreement, introduced new features (i.e., a water pricing scheme) that were more reflective of a Philosophy 1 approach to water trade. This case demonstrates that parties interested in externally obtaining or transferring water resources could initiate the process of doing so according to one water trade philosophy and then transition to a different philosophy that better suits their needs and interests as these develop over time.

The case of water trade between Singapore and Johor also demonstrates that an instance of bulk water trade that developed out of a prior proxy water trade relationship can retain certain elements of that prior relationship, such as the pricing of water-related objects other than water resources themselves, while also encapsulating new features representative of other philosophies. For example, although the 1962 agreement discusses the pricing of untreated, unbottled water that is exported from Johor and imported by Singapore, it also retains some of the language regarding the costs paid by Singapore to Johor for leased land introduced in the 1927 agreement.

#### **Section 2.4.4: Discussion**

As I mentioned previously, the IBWTB was created to fill a very specific gap in the study of international bulk water trade, i.e., the lack of a consolidated collection of executed instances of international bulk water trade. Although I recognize that the IBWTB may not be a completely exhaustive collection of such instances due to limited available information regarding bulk water trade relations, it is nevertheless the most comprehensive list of its kind. The IBWTB was a critical resource in my research, serving as a centralized source of bulk water trade information from which

I could pull case studies. The IBWTB will also be a critical tool for others looking to study bulk water trade. Interested parties, which could include governments, private companies, and scholars, now have access to a consolidated source of bulk water trade instances they can use to find examples of such trade, study its implications, and identify lessons that could shape the development of future bulk water trade relations.

The IBWTB was also particularly important in accomplishing my goal of shifting the conversation regarding bulk water trade out of the theoretical realm and into reality. It did so by showcasing the existence of successful past and present bulk water trade relations that offer potential insights regarding the nature of such relations. The assessment of these instances enabled me to identify actual bulk water trade relations that I could then analyze so as to not solely rely on theoretical considerations regarding such relations. Such theoretical considerations have already been addressed at length in the literature on bulk water trade.<sup>327</sup>

In applying my water trade typology to the bulk water trade instances included in the IBWTB, I noted that Philosophy 1 was the most well-represented philosophy. While the popularity of Philosophy 1 could have implications for the development of future bulk water trades, since it serves as the most abundant precedent for countries looking to establish bulk water trade relations based on others' examples, my analysis does not extend into determining *why* Philosophy 1 is the most popular approach. Therefore, any discussion in this work beyond the observation of this fact would be based solely on speculation; however, this observation does provide a potential avenue

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<sup>327</sup> I elaborate on the state of the literature on bulk water trade in Chapter 1.1. Literature concerning the theoretical application of international trade laws to bulk water trade largely focus on the potential bulk water trade relations between the United States and Canada. See, *inter alia*: Larson, "In Deep Water: A Common Law Solution to the Bulk Water Export Problem"; Baumann, "Water Wars"; Larson et al., *The Case of Canadian Bulk Water Exports*; Isabel Dendauw, "The Great Lakes Region and Bulk Water Exports," *Water International* 25, no. 4 (December 1, 2000): 565–71, <https://doi.org/10.1080/02508060008686871>; Binda Preet Sahni, "Status of Bulk Water Exports Under NAFTA," *University of Miami International and Comparative Law Review* 22, no. 1 (Fall 2014): 77-90. <https://repository.law.miami.edu/cgi/viewcontent.cgi?article=1269&context=umiclrl>.



for future research. Despite this limitation, the importance of the typology I presented as a contribution to the study of bulk water trade should not be understated. No such typology existed prior to this work. My typology now serves as a resource for not only studying bulk water trade relations, but also for establishing new ones that build on and/or employ the same approaches to water trade presented and described therewithin.

In addition to the aforementioned contributions made specifically to the study of bulk water trade, my analysis of water's definitions serves as a significant contribution to the study of international water law and politics more generally. The definitions, descriptions, and sources I aggregated in Table 3 will serve as helpful tools for future scholars writing about how water is conceptualized by international actors. Rather than conducting their own survey analysis of primary and subsidiary sources of international law and other significant texts relating to the use and management of water resources, scholars will be able to rely on my research. My analysis also supports claims that water is a truly unique resource based on its various characteristics, its immense range of uses, and the diversity of services it provides.

Using the IBWTB, a typology of water trade philosophies, and a collection of water's various definitions, I established a foundational understanding of bulk water trade and the way in which water is conceptualized by international actors. I applied these understandings to my analysis of bulk water trade case studies to arrive at the significant findings discussed above. This analysis and the findings it yielded went directly toward addressing the two questions that inspired the research presented in this work. In what follows, I discuss how.

1. Research Question 1: How do parties engaged in international bulk water trade relations approach water as the object of such trade?

As I discussed in Chapter 1.1, there continues to be a great deal of uncertainty regarding the application of international trade law to bulk water trade.<sup>328</sup> This uncertainty largely rests on the unanswered question of whether untreated, unbottled water that is traded internationally falls within the scope of a “good” or “product” under GATT/WTO law. The significance of this question is based on the fact that recognizing an object as either a “good” or “product,” as these terms are defined under GATT/WTO law, would trigger the application of GATT provisions to the trade of that object.<sup>329</sup>

Important to note is that the application of the GATT to the trade of bulk water would include governing such trade according to GATT Article XI, which bans the establishment of quantitative restrictions on traded products.<sup>330</sup> The implications of this may include the inability of bulk water exporting countries to lawfully stop or restrict bulk water exports in the event of a domestic water shortage without imposing similar restrictions on domestic water users.<sup>331</sup> Therefore, the application of GATT provisions is said to potentially constrain the sovereign control a country can exercise over its domestic water resources.<sup>332</sup> Specifically, some fear that the application of GATT Article XI to the trade of untreated, unbottled water resources would “supersede state regulation of water once one [WTO] member [state] allows [for the] exportation” of bulk water.<sup>333</sup>

The question of whether untreated water resources can be classified as goods or products under GATT/WTO law is itself two-fold. First, it must be determined whether these

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<sup>328</sup> Temmerman, *Bulk Fresh Water Resources and the GATT*, 2017, 28–31; Szwedo, *Cross-Border Water Trade*, 90–100.

<sup>329</sup> Brown Weiss, *International Law for a Water-Scarce World*, 7:259–63.

<sup>330</sup> General Agreement on Tariffs and Trade 1994, art. XI, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, 1867 U.N.T.S. 187, 33 I.L.M. 1153 (1994), [https://www.wto.org/english/res\\_e/booksp\\_e/agrmtseries2\\_gatt\\_e.pdf](https://www.wto.org/english/res_e/booksp_e/agrmtseries2_gatt_e.pdf).

<sup>331</sup> Larson, “In Deep Water: A Common Law Solution to the Bulk Water Export Problem,” 747.

<sup>332</sup> Brown Weiss, *International Law for a Water-Scarce World*, 7:259–66.

<sup>333</sup> Larson, “In Deep Water: A Common Law Solution to the Bulk Water Export Problem,” 740.

terms apply to water resources *still contained within* water sources (e.g., the water in a lake). Second, it must be determined whether untreated, unbottled water resources *removed from* a water source via human intervention and subsequently exported ought to be considered “goods” or “products.”<sup>334</sup>

Regardless of the debate regarding water’s status as a “good” or “product,” by intently examining the details of actual instances of executed international bulk water trades, I demonstrated that water has been and is recognized as an *economic good* with economic value. I showed that parties engaged in international bulk water trade treat water as an economic good by valuing and appraising water and by representing water’s value in a way that facilitates its exchange between trade parties on the basis of agreed-upon terms. This assessment builds on my analysis of water’s definition as an economic good in Chapter 2.2.

Through my analysis of various water trade philosophies, I further demonstrated that the treatment of water as an economic good in the context of bulk water trade is not uniform; rather, it varies across instances of bulk water trade based on how relevant trade parties choose to represent water’s value in a way that enables them to trade water. According to my fifth significant finding, however, there are certain common features in the context of water trade relations that can be used to classify approaches to such trade. Furthermore, according to my fourth finding, the treatment of water as an economic good is not realized to the exclusion of other conceptualizations of water. This is further supported by my observation in Chapter 2.2 that varying definitions of water can be *simultaneously* applied to it.

Additionally, the variation in the treatment of water as an economic good in the context of bulk water trade suggests a degree of flexibility in the realization of such treatment. This flexibility

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<sup>334</sup> Brown Weiss, *International Law for a Water-Scarce World*, 7:259–63.

could potentially help assuage concerns regarding treating water as an economic good while respecting water's special status and various other definitions. Assuaging such concerns could prove vital in the recognition of bulk water trade as an effective and sustainable means of addressing changing international water availability and the unequal global distribution of water resources.

Therefore, according to my analysis, my first research question can be answered as follows. Parties engaged in international bulk water trade treat water, which is the object of such trade relations, as an economic good. Such treatment, however, is neither realized to the exclusion of other conceptualizations of water nor uniform. Although there are discernable differences in the way bulk water trade parties treat water in the context of their approaches to such trade, these approaches also contain similar features that allow for their classification according to an established typology. Additionally, the intricacies, and indeed the *nuances*, of this analysis concerning the treatment of water as an economic good in the context of bulk water trade affirm my first hypothesis that *the treatment of water in the context of bulk water trade is much more nuanced than the arguments presented by bulk water trade's detractors suggest.*

2. How can past and present instances of bulk water trade inform the development of a framework for the regulation of such trade at the international level?

According to my first significant finding, no uniform practice, or *framework*, for the international export and import of water as the object of trade relations in its own right currently exists. In this work, I did not directly contend with the question regarding the applicability of GATT/WTO provisions to the practice of bulk water trade. I also did not prescribe a specific framework for such trade. What I accomplished instead was the discovery of key insights taken from an analysis of how international parties actually go about exporting and importing water that could inform the creation of a framework for bulk water trade. These insights can be summarized

as two critical considerations that ought to be taken into account in the formulation of such a framework. These considerations are: 1) water's diverse definitions based on its various characteristics, uses, and services and 2) the degree of autonomy granted to states regarding their approaches to water trade.

#### Consideration 1: Water's Diverse Definitions

In Chapter 2.3, I analyzed the water trade philosophies included in my typology against the backdrop of water's various definitions presented in Chapter 2.2. As I demonstrated in Chapter 2.2, several definitions have been applied to water by the international community reflecting its diverse characteristics, uses, and services. This range of definitions stretches beyond the notions of water as just a human right, a unique and essential resource, or an economic good. It also includes conceptualizations regarding water's environmental characteristics and services and its uses in the facilitation of trade and transport.

While uncertainties regarding the regulation of water in the context of bulk water trade based on its potential status as either a "good" or "product" under the GATT remain, the definitions of water I discussed in Chapter 2.2 are well-established in primary and subsidiary sources of international law and in other significant texts relating to the use and management of water resources. The existence and wide-scale recognition of these definitions promotes their status as potential resources for the articulation of an international legal framework for bulk water trade. Drafters of such a framework need not start from scratch in attempting to determine what principles of international water use and management should inform their task. These principles have already been articulated and identified elsewhere. As such, these principles and definitions may serve as guidelines for the effectuation of a clearer framework governing international bulk water trade relations.

The employment of water's recognized definitions relating to environmental concerns as guidelines is especially important. These include the notion of water as an ecosystem, a part of the environment, and a habitat and water as a limited resource in need of protection. The importance of incorporating these definitions in the effectuation of clearer framework for bulk water trade is two-fold. First, incorporating these definitions would help assuage concerns articulated by opponents of bulk water trade that the bulk removal and transfer of water has devastating effects on the ecological well-being of the water sources from which the water is extracted.<sup>335</sup>

Second, incorporating these definitions would help address growing international recognition regarding the urgency of taking collective action to protect the global environment. By effectively accounting for water's various definitions, specifically those pertaining to environmental concerns, drafters of a framework for bulk water trade can ensure that such a framework holds up to scrutiny from environmentally conscious opponents of bulk water trade and an increasingly environmentally conscious global community.<sup>336</sup>

Furthermore, it is important to note that I based my analysis of water's definitions on binding and non-binding sources of international law and significant texts relating to the use and management of water resources from an assortment of international legal regimes. Therefore, in order to avoid placing contradictory obligations on states, any conversation regarding the

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<sup>335</sup> Baumann, "Water Wars," 112, 131.

<sup>336</sup> International Union for Conservation of Nature, "Global Pact for the Environment," IUCN, March 17, 2018, <https://www.iucn.org/commissions/world-commission-environmental-law/resources/wcel-important-documentation/global-pact-environment>; Stewart M. Patrick, "Rejoining the Paris Agreement Is the Easy Part for Biden on Climate Change," *World Politics Review* (blog), November 9, 2020, <https://www.worldpoliticsreview.com/articles/29201/rejoining-the-paris-agreement-is-the-easy-part-of-the-biden-climate-plan>; Stewart M. Patrick, "How Biden Can Embrace Environmental Stewardship," *World Politics Review* (blog), February 22, 2021, <https://www.worldpoliticsreview.com/articles/29441/it-s-time-to-take-biodiversity-threats-more-seriously>; Yungho Weng, Kuang-Chung Hsu, and Bih Jane Liu, "Increasing Worldwide Environmental Consciousness and Environmental Policy Adjustment," *The Quarterly Review of Economics and Finance* 71 (February 1, 2019): 205–10, <https://doi.org/10.1016/j.qref.2018.08.003>.

regulation of water resources as objects of trade at the international level ought to take into account water's diverse definitions and unique characteristics, uses, and services.

Finally, in examining water's various definitions, I verified water's special status<sup>337</sup> by demonstrating that water is indeed recognized as a unique kind of resource that is essential for all life on Earth and not substitutable in the same way other essential resources (e.g., food) are. In my analysis of case studies, I showed that bulk water trade, wherein water is treated as an economic good, does not necessarily nullify water's special status. In fact, I discussed how the approach to bulk water trade represented by Philosophy 2 supports the recognition of water's unique and essential nature. I also illustrated how definitions of water outside its recognition as an economic good are addressed by the terms of trade governing bulk water trade relations.

The articulation of a framework for bulk water trade that treats water as an economic good, therefore, would not necessarily void water's other definitions; instead, such a framework could champion these other definitions by considering and employing them as guiding principles that inform and shape the manifestation and regulation of bulk water trade relations. Additionally, the insights enveloped by this consideration concerning the diversity of water's definitions further affirm my first hypothesis.

#### Consideration 2: The Degree of Autonomy Granted to Parties of Bulk Water Trade

My first, third, and sixth significant findings demonstrate the range of options available to countries seeking to externally obtain and/or transfer water resources. These options include a diversity of approaches to water trade, as well as the possibility of transitioning between approaches. This range of options highlights another critical consideration that ought to be

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<sup>337</sup> I define what I mean by water's special status in Chapter 1.1.

accounted for in the articulation of a clearer international framework regarding the trade of water resources: the degree of autonomy granted to countries regarding their approaches to water trade.

Without the clear application of international trade law or other formal regulatory framework to the trade of water, countries have maintained a high degree of autonomy regarding how they approach such trade. This autonomy has enabled interested parties to establish water trade relations based on water trade philosophies that best suit their needs. This is reflected in my key findings produced by analyzing various bulk water trade case studies.

This autonomy, however, can also be exploited to serve protectionist interests, both in terms of a country's national water resources and its domestic industries. For example, regarding the former, multiple companies have tried to and have indeed succeeded in acquiring licenses from provincial governments to export bulk water out of Canada. In 1998, the Nova Group, a Canadian company based out of Sault Ste. Marie, obtained a license from the government of Ontario to export water from Lake Superior; however, this license was ultimately withdrawn due to mounting public pressure to ban bulk water withdrawals.<sup>338</sup> In 1990, the government of British Columbia issued water export licenses to Sun Belt Water Inc. and Snowcap Waters Ltd.; however, the licenses were suspended in 1999 when the federal government of Canada imposed a nation-wide "temporary moratorium" on the export of bulk water.<sup>339</sup>

Canada has since pursued a strict policy of objecting to the application of international trade law to untreated, unbottled water.<sup>340</sup> For example, in 2001, the International Boundary Waters Treaty Act, which governs the waters on the U.S.-Canada border, was amended to include a ban

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<sup>338</sup> Temmerman, *Bulk Fresh Water Resources and the GATT*, 2017, 7.

<sup>339</sup> Larson et al., *The Case of Canadian Bulk Water Exports*; Water Bank, "The Sun Belt Case," Water Bank Newsletters, June 16, 2004, <http://www.waterbank.com/Newsletters/nws38.html>; Anthony Depalma, "Free Trade in Fresh Water? Canada Says No and Halts Exports," *The New York Times*, March 8, 1999, sec. World, <https://www.nytimes.com/1999/03/08/world/free-trade-in-fresh-water-canada-says-no-and-halts-exports.html>.

<sup>340</sup> Szewedo, *Cross-Border Water Trade*, 87.



on the bulk removal of transboundary waters under Article 13.<sup>341</sup> Canada's policy of defining untreated, unbottled water explicitly as a non-economic good was discussed in more detail in Chapter 2.2.

Supporters of Canada's policy regarding bulk water trade and removal underscore the importance of maintaining Canada's national supply of fresh water, which constitutes 20 percent of all global freshwater resources, for the benefit of its citizens and environment.<sup>342</sup> As Lasserre and Forest note, conversations regarding the possibility of bulk water exports have contributed "to the kindling of a hydro-nationalism that considers water as a national symbol and ... patrimony" among the Canadian public.<sup>343</sup> Bulk water trade has become "taboo for [Canadian] politicians and policy-makers."<sup>344</sup> This public hydro-nationalism coupled with the aforementioned national water policies can be construed as a kind of water protectionism. Canada, however, formally joined the international consensus recognizing access to water as a fundamental human right, as it is articulated in UNGA Resolution 64/292, in 2012.<sup>345</sup> The reality of Canada's protectionist water policy seems to beg the question of whether the country's recognition of the human right to water truly applies to all people or only Canadians.

Countries can also abuse autonomy over approaches to water trade to protect domestic industries, thereby subverting international free trade principles. For example, in 2014, Slovakia

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<sup>341</sup> Szwedo, 194.; International Boundary Waters Treaty Act, R.S.C. 1985, c. I-17, s. 13 (Can.), <https://laws-lois.justice.gc.ca/eng/acts/I-17/page-1.html>.

<sup>342</sup> Depalma, "Free Trade in Fresh Water?," March 8, 1999.

<sup>343</sup> Frédéric Lasserre and Patrick Forest, "Continental Bulk Water Transfers: Chimera or Real Possibility?," in *Water without Borders?* (University of Toronto Press, 2013), 88–118, [https://www.researchgate.net/publication/303422132\\_Continental\\_bulk\\_water\\_transfers\\_Chimera\\_or\\_real\\_possibility](https://www.researchgate.net/publication/303422132_Continental_bulk_water_transfers_Chimera_or_real_possibility).

<sup>344</sup> Lui, "Debate on Bulk Water Exports to U.S. Resurfaces despite Recent Droughts in Canada."

<sup>345</sup> Léo Heller, "OHCHR | 10th Anniversary of the Recognition of Water and Sanitation as a Human Right by the General Assembly," United Nations Human Rights Office of the High Commissioner, July 28, 2020, <https://www.ohchr.org/EN/NewsEvents/Pages/DisplayNews.aspx?NewsID=26116&LangID=E>; Vi Bui, "Celebrating 10 Years of the Human Right to Water," The Council of Canadians, July 2020, <https://canadians.org/analysis/celebrating-10-years-human-right-water>.

amended its constitution to include a ban on bulk water exports.<sup>346</sup> Specifically, “the export of water from Slovakia by vehicle or pipeline other than in consumer packaging for humanitarian needs” is banned under Article 4(2) of the country’s amended constitution.<sup>347</sup>

The ban was reportedly imposed for environmental reasons. According to Kellman’s analysis, however, it is unlikely that environmental protection was the true motivation behind the ban. Kellman bases her claim in part on the fact that the ban prohibits neither the bulk removal of water from Slovakian water sources nor the export of water bottles from Slovakia. As such, the ban does little in the way of actually protecting natural water sources in Slovakia.<sup>348</sup> Nevertheless, the ban does appear to offer substantive protections to the Slovakian workforce and bottling industry by forcing companies interested in selling Slovakian water to bottle the water they extract within Slovakian territory.<sup>349</sup> Kellman therefore concludes that the ban was likely imposed to protect the domestic Slovakian bottling industry.<sup>350</sup> Kellman further finds that the ban, which serves Slovakian protectionist interests at the expense of free trade, would likely not be justified under WTO rules, if water were to be classified as a “product” under the GATT.<sup>351</sup>

Based my analysis of water trade philosophies and case studies, autonomy over water trade relations has indeed granted countries an important degree of flexibility necessary for articulating terms of trade that best suit their needs and interests regarding the obtainment and transfer of water resources. Specifically, in the absence of a clearly defined framework for bulk water trade, countries have established their own approaches to water trade. These approaches include both

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<sup>346</sup> Kellman, “Water Trade and the WTO,” 216.

<sup>347</sup> ÚSTAVA SLOVENSKEJ REPUBLIKY [Constitution] Ch I, art. 1, para. 2 (Slovk.) <http://extwprlegs1.fao.org/docs/pdf/slo136190.pdf>.

<sup>348</sup> Kellman, “Water Trade and the WTO,” 228–30.

<sup>349</sup> Kellman, 234–36.

<sup>350</sup> Kellman, 242.

<sup>351</sup> Per Kellman’s interpretation, the terms “product” and “good” are used interchangeably in the GATT. *See*: Kellman, 221–22.

diverse philosophies toward bulk water trade and a proxy philosophy for the export- and importation of water sans the economic valuation and appraisal of water that is characteristic of bulk water trade. This autonomy also encompasses the possibility of transitioning between philosophies as interests and needs develop overtime. Preserving the current autonomy countries have over the management of domestic water resources could also assuage concerns that bulk water trade gravely impairs the ability of national governments to meet domestic water needs by diminishing national sovereignty over water resources.<sup>352</sup>

The examples of emerging hydro-nationalism in Canada and suspected water bottle industry protectionism in Slovakia, however, demonstrate how such autonomy could be abused. Such abuse could result in the subversion of water- and non-water-related interests and objectives, such as the realization of the human right to water and the preservation of international principles of free trade. This potential for abuse also underscores the relevance of effectuating a legal framework for bulk water trade in the first place. Absent such a framework, there are no clearly defined expectations for behavior, metrics by which to identify violations or misconduct, or methods for dispute resolution and recourse. The continued uncertainties regarding what rules apply to bulk water trade relations breed such conditions, which states could take advantage of to serve their interests at the expense of others or the international community as a whole.

Furthermore, the articulation of a clearer framework for bulk water trade at the international level could support the configuration of a more regular and reliable system for recording bulk water trade data. As I have mentioned previously, the paucity of available and accessible information regarding many bulk water trade instances was a significant hurdle in my analysis. An internationally recognized framework could induce or even require the establishment

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<sup>352</sup> Brown Weiss, *International Law for a Water-Scarce World*, 7:266–67; Larson, “In Deep Water: A Common Law Solution to the Bulk Water Export Problem,” 740, 747.

of a more standard system of reporting and recording bulk water trade data. This would not only expand the amount of information available to assess the implications of such trade but would also ensure that parties looking to develop new bulk water trade relations have ample information with which to make informed decisions. Thus, there is a delicate balance to be struck between the preservation of some degree of state autonomy over water trade relations and the articulation of a framework for such trade that defines expectations, violations, and methods for resolving disputes.

### Review of Considerations

The two considerations discussed above are products of my analysis of actual instances of bulk water trade grounded in a detailed assessment of water's various definitions. As such, these considerations demonstrate that actual instances of bulk water trade not only serve as mere examples or precedents for the development of future bulk water trade relations but also offer critical insights regarding the formulation of a framework for the regulation of such trade at the international level. Therefore, these insights demonstrate precisely how past and present instances of bulk water trade can inform the development such a framework, thus answering my second research question. Furthermore, the existence of the insights discussed above, their perceptibility through an assessment of actual instances of bulk water trade, and their potential value in the creation of a framework for bulk water trade affirms my second hypothesis that *the practices of parties to bulk water trade that emerge in the absence of a clear framework governing such trade offer discernable insights that can inform the actual establishment of such a framework.*

## **Part 3: Concluding Summary**

### *Chapter 3.1: Conclusion*

International bulk water trade has been cited as a potential means of meeting international water needs, addressing growing water scarcity, realizing the human right to water, and rectifying

the unequal distribution of global water resources.<sup>353</sup> Despite the opportunities presented by bulk water trade, there remains a great deal of debate regarding whether such trade should occur due to its potential implications on the preservation of water's special status as a human right and a unique and essential resource. This debate is complicated by uncertainty regarding how bulk water trade ought to be regulated under the existing GATT/WTO regime of international trade law.<sup>354</sup>

Rather than reiterating these points, this work focused on analyzing actual instances of bulk water trade and the provisions that govern them to answer two questions: 1) how do parties to international bulk water trade relations approach water as the object of such trade and 2) how can past and present instances of bulk water trade inform the development of a framework for the regulation of such trade at the international level? To answer these questions, I implemented a four-step research methodology, which included compiling the most comprehensive collection of actual instances of bulk water trade to date. Using this collection of instances, which I named the IBWTB, I created a novel typology of bulk water trade approaches, or “philosophies.” I also identified a proxy philosophy of water trade wherein parties could externally obtain and transfer water without engaging in bulk water trade, *per se*.

In answering my first question, I found that parties engaged in international bulk water trade approach water, which is the object of such trade relations, as an economic good. Such

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<sup>353</sup> Temmerman, *Bulk Fresh Water Resources and the GATT*, 2017, 63; Anderson and Landry, “Exporting Water to the World,” n.d., 60–61; Mark Clayton, “Forget OPEC. The next Cartel May Export Drinking Water.,” *Christian Science Monitor*, December 30, 2004, <https://www.csmonitor.com/2004/1230/p13s01-sten.html>; Brett Walton, “Bulk Water Exports: Alaska City Wants to Sell the World a Drink,” *Circle of Blue* (blog), June 2, 2010, <https://www.circleofblue.org/2010/world/bulk-water-exports-alaska-city-wants-to-sell-the-world-a-drink/>; Andrew Cuthbert, “A Review of the Arguments Relating to Bulk Export of Water” (Scotland UK: CREW - Centre of Expertise for Waters and The James Hutton Institute, April 30, 2012), <https://www.crew.ac.uk/sites/www.crew.ac.uk/files/calldownservice/Water%20Export.pdf>.

<sup>354</sup> Baumann, “Water Wars,” 112,131; Larson, “In Deep Water: A Common Law Solution to the Bulk Water Export Problem,” 742; Temmerman, *Bulk Fresh Water Resources and the GATT*, 2017, 248–49; Alexandre Le Vernoy, “The Trade and Water Nexus,” ADBI Working Paper Series (Tokyo, Japan: Asian Development Bank Institute, February 2017), <https://www.adb.org/sites/default/files/publication/229676/adbi-wp669.pdf>.

treatment of water, however, is neither to the exclusion of other conceptualizations of water nor uniform. Furthermore, although approaches to water trade exhibit discernable differences, they also possess select similarities that allow for their classification according to an established typology. As such, I concluded that the treatment of water in the context of bulk water trade is more nuanced than arguments made by its detractors suggest, thereby affirming my first hypothesis.

Regarding my second question, I found that past and present instances of bulk water trade do in fact offer several critical insights that can meaningfully inform the establishment of a framework for bulk water trade at the international level. I summarized these insights, the existence of which affirmed my second hypothesis, in the form of two critical considerations. Specifically, drafters of a framework for bulk water trade ought to consider 1) the range of water's diverse definitions based on its various characteristics, uses, and services and 2) the degree of autonomy granted to states regarding their approaches to water trade.

By analyzing actual instances of bulk water trade, I succeeded in shifting the focus regarding bulk water trade from the theoretical to the actual. In so doing, I directly contributed to the literature on bulk water trade, which, as I mentioned in Chapter 1.1, has largely focused on the feasibility of and normative debate surrounding such trade. Despite the contributions offered in this work, several opportunities for additional research remain. More work can be done to fill in the "unknowns" in the IBWTB. Parties engaged in bulk water trade can support such efforts by keeping better records of their relations and making such information public. As I mentioned in Chapter 2.4, the establishment of a framework for bulk water trade could also help rectify these knowledge gaps.

More research can also be done to add instances to the IBWTB. Expanding the IBWTB would increase the pool of examples parties could use to model new bulk water trade relations on. Expanding the IBWTB would also provide additional data for the purposes of analyzing how bulk water trade is conducted and how water is treated in the context of such trade. Furthermore, my research focused on *past* and *present* instances of bulk water trade. As such, I did not analyze *potential* bulk water trades or relations that are currently under negotiation. Therefore, further research could be done on what patterns emerge, methods of negotiation are employed, and issues are raised in the course of establishing new bulk water trade relations.

Finally, and perhaps most importantly, there is a need for additional research supporting the actual creation of a framework for bulk water trade at the international level. The formulation of such a framework is important because it will help establish expectations of and guidelines for behavior. This framework could be articulated within the existing structures of international trade law, international water law, or an entirely different area of law. Regardless of what legal discipline this framework is grounded in, I urge its crafters to use the considerations and insights taken from past and present instances of bulk water trade and presented in this work to inform their task. Integrating insights taken from existing bulk water trade relations in the formation of such a framework would bolster its effectiveness and reduce the transaction costs of applying it to relations that developed in its absence. It would also allow the framework's crafters to address issues related to bulk water trade that have already been diagnosed and mitigate their impact on the formation and quality of future relations.

As global water scarcity becomes an increasingly real and dangerous threat to the safety and well-being of countries, individuals, and the environment, the attractiveness of bulk water

trade as a means of addressing these concerns will also grow.<sup>355</sup> Having established rules for such trade engagements would help ensure that they are conducted in furtherance—rather than to the potential detriment—of the objectives of the international community concerning the preservation of life, human rights, environmental well-being, and economic prosperity.<sup>356</sup>

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<sup>355</sup> Szwedo, *Cross-Border Water Trade*, 3; Temmerman, *Bulk Fresh Water Resources and the GATT*, 2017, 4; de Haan, “Chapter 15: Balancing Free Trade in Water and the Protection of Water Resources in GATT,” 245.

<sup>356</sup> Temmerman, *Bulk Fresh Water Resources and the GATT*, 2017, 249–50.



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## Annex 1: The International Bulk Water Trade Bank (IBWTB)

Link to OneDrive Workbook: [https://georgetown1-my.sharepoint.com/:x:/g/personal/amz52\\_georgetown\\_edu/ESMhUZ40WNhLiiEBJgPj3bQBH24PbIn0tGSNeQrZldmDg?e=plMkd4](https://georgetown1-my.sharepoint.com/:x:/g/personal/amz52_georgetown_edu/ESMhUZ40WNhLiiEBJgPj3bQBH24PbIn0tGSNeQrZldmDg?e=plMkd4)

Exporter	Importer	Status	Date (Year/Decade) Initiated	Means of Trade	Approach to Water Trade	Source(s)†	Notes (*)
Turkey	Northern Cyprus	Active	2015	Pipes/Pipeline	Philosophy 1	Szwedo, <i>Cross-Border Water Trade</i> , 149.	
Turkey	Northern Cyprus	Inactive	1998	Bags	Philosophy 1	Anderson and Landry, "Exporting Water to the World," n.d., 64; Robert E. Kohn, "Israel's Need to Import Freshwater," <i>Water, Air, and Soil Pollution</i> 143, no. 1 (February 1, 2003): 264, <a href="https://doi.org/10.1023/A:1022895818242">https://doi.org/10.1023/A:1022895818242</a> ; Szwedo, <i>Cross-Border Water Trade</i> , 147-148.	* Using technology/infrastructure from Nordic Water Supply Company, based in Oslo, Norway
Federated States of Micronesia (Kosrae)	Nauru	Inactive	2002	Ship	Philosophy 1	Szwedo, <i>Cross-Border Water Trade</i> , 143; Ian Wallis and Lisa Russ, "National Integrated Water Resource Management Diagnostic Report: Nauru," SOPAC Miscellaneous Report, Sustainable Integrated Water Resources and Wastewater Management in Pacific Island Countries (Nauru: Ministry of Commerce, Industry and Resources, November 2007), <a href="https://www.pacificwater.org/userfiles/file/GEF%20IWRM%20Final%20Docs/MR0640nAURU.pdf">https://www.pacificwater.org/userfiles/file/GEF%20IWRM%20Final%20Docs/MR0640nAURU.pdf</a> ; David Duncan, "Freshwater under Threat: Pacific Islands : Vulnerability Assessment of Freshwater Resources of Environmental Change," Vulnerability Assessment (Bangkok, Thailand: United Nations Environment Programme, March 2012), <a href="http://www.unep.org/dewa/Portals/67/pdf/Freshwater_Under_Threat-Pacific_Islands.pdf">http://www.unep.org/dewa/Portals/67/pdf/Freshwater_Under_Threat-Pacific_Islands.pdf</a> .	
Maylasia (State of Johore)	Signapore	Inactive	1989	Unknown	Philosophy 1	Ministerial Committee Examining the Export of Bulk Water, "Export of Bulk Water from Newfoundland and Labrador: A Report of the Ministerial Committee Examining the Export of Bulk Water."	
New Zealand	Japan	Unknown	2012	Flexi Tanks	Philosophy 1	Newsire.com, "Historical Bulk Water Shipment Leaves New Zealand," Newsire, June 23, 2012, <a href="https://www.newsire.com/historical-bulk-water-shipment/182423">https://www.newsire.com/historical-bulk-water-shipment/182423</a> .	* Private comany: Aqua Naida Limited
New Zealand	Unknown	Unknown	Unknown	Unknown	Philosophy 1	Heartland Springs, "Bulk Sales & Export Heartland Springs Raw Organic Spring Water Home Delivery," Heartland Springs, accessed April 13, 2021, <a href="http://www.heartland springs.com/bulk-sales-export">http://www.heartland springs.com/bulk-sales-export</a> .	* Private company: Heartland Springs
China	United Kingdom (Hong Kong)	Inactive	1960s	Tanker	Philosophy 1	Szwedo, <i>Cross-Border Water Trade</i> , 140; Hong Kong Free Press, "Hong Kong Is Too Reliant on Costly Mainland Water, Says Think Tank - so What's the Alternative?," Hong Kong Free Press, December 28, 2019, <a href="https://hongkongfp.com/2019/12/28/hong-kong-reliant-costly-mainland-water-says-think-tank-whats-alternative/">https://hongkongfp.com/2019/12/28/hong-kong-reliant-costly-mainland-water-says-think-tank-whats-alternative/</a> .	* Original trade used a tanker in the 1960s; Not "international" after 1997
China	United Kingdom (Hong Kong)	Active	1965	Pipes/Pipeline	Philosophy 1	Hong Kong Free Press, "Hong Kong Is Too Reliant on Costly Mainland Water, Says Think Tank - so What's the Alternative?"	* Original trade used a tanker in the 1960s; Not "international" after 1997
China	Taiwan	Active	2018	Pipeline	Philosophy 1	VOA, "Taiwan's Kinmen Island Begins Importing Water from China   Voice of America - English," Voice of America, August 6, 2018, <a href="https://www.voanews.com/east-asia/taiwans-kinmen-island-begins-importing-water-china">https://www.voanews.com/east-asia/taiwans-kinmen-island-begins-importing-water-china</a> ; Nikkei Asia, "Taiwan's Kinmen Island Begins Importing Water from China," Nikkei Asia, August 7, 2018, <a href="https://asia.nikkei.com/Politics/International-relations/Taiwan-s-Kinmen-island-begins-importing-water-from-China">https://asia.nikkei.com/Politics/International-relations/Taiwan-s-Kinmen-island-begins-importing-water-from-China</a> ; "Jinjiang-Kinmen Pipeline," in Wikipedia (Online: Wikipedia, March 29, 2021), <a href="https://en.wikipedia.org/w/index.php?title=Jinjiang%E2%80%93Kinmen_Pipeline&amp;oldid=1014824077">https://en.wikipedia.org/w/index.php?title=Jinjiang%E2%80%93Kinmen_Pipeline&amp;oldid=1014824077</a> .	
Bolivia	Chile	Inactive	2001	Acquifer	Philosophy 1	Temmerman, <i>Bulk Fresh Water Resources and the GATT</i> , 2017, 5; Dr. William M. Turner, "Bolivia Permits Bulk Export of Water to Chile," News release, (June 16, 2004), <a href="http://www.waterbank.com/Newsletters/nws39.html">http://www.waterbank.com/Newsletters/nws39.html</a> ; Monica Fera-Tinta, "Bolivia and Chile in The Hague: Can They Quiet the Ghosts of the Pacific War, and Thrive Together in the 21st Century?," <i>Opinio Juris</i> (blog), March 27, 2018, <a href="http://opiniojuris.org/2018/03/27/bolivia-and-chile-in-the-hague-can-they-quiet-the-ghosts-of-the-pacific-war-and-thrive-together-in-the-21st-century/">http://opiniojuris.org/2018/03/27/bolivia-and-chile-in-the-hague-can-they-quiet-the-ghosts-of-the-pacific-war-and-thrive-together-in-the-21st-century/</a> ; Rutgerd Boelens and Hugo de Vos, "Water Law and Indigenous Rights in the Andes," <i>Cultural Survival</i> , December 2005, <a href="http://www.culturalsurvival.org/publications/cultural-survival-quarterly/water-law-and-indigenous-rights-andes">http://www.culturalsurvival.org/publications/cultural-survival-quarterly/water-law-and-indigenous-rights-andes</a> .	
UK (England)	Greece	Unknown	1997	Bags	Philosophy 1	Barlow, "THE GLOBAL TRADE IN WATER from the Booklet Blue Gold The Global Water Crisis and the Commodification of the World's Water Supply A Special Report Issued by the International Forum on Globalization (IFG);" Gleick, <i>The World's Water: The Biennial Report on Freshwater Resources 1998-1999</i> , 1:200; Terry L Anderson and Clay J Landry, "Exporting Water to the World," n.d., 64.	

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Exporter	Importer	Status	Date (Year/Decade) Initiated	Means of Trade	Approach to Water Trade	Source(s)†	Notes (*)
Canada (mostly the City of St. John's)	Foreign Ships	Active (multiple)	Unknown	Unknown	Philosophy 1	Ministerial Committee Examining the Export of Bulk Water, "Export of Bulk Water from Newfoundland and Labrador: A Report of the Ministerial Committee Examining the Export of Bulk Water."	* Limited public information
Czech Republic	Poland (Jastrzębie Zdrój)	Active	2001	Pipes/Pipeline	Philosophy 1	Szwedo, <i>Cross-Border Water Trade</i> , 142; "Do Jastrzębia płynie woda z Czech," <i>Nasze Miasto: śląskie naszemiasto</i> , January 13, 2005, <a href="https://slaskie.naszemiasto.pl/do-jastrzebia-plynie-woda-z-czech/ar/c3-154459">https://slaskie.naszemiasto.pl/do-jastrzebia-plynie-woda-z-czech/ar/c3-154459</a> .	
Czech Republic	Poland (Leszna Góma)	Active	2008	Pipes/Pipeline	Philosophy 2	Szwedo, <i>Cross-Border Water Trade</i> , 142; "Czeska Woda w Polskich Kranach   <i>Gazetacodzienna</i> ," <i>Gazeta Codzienna</i> , February 25, 2008, <a href="http://gazetacodzienna.pl/article/gospodarka/czeska-woda-w-polskich-kranach">http://gazetacodzienna.pl/article/gospodarka/czeska-woda-w-polskich-kranach</a> .	
Unknown	Japan	Inactive	1994	Ship	Philosophy 2	James McNiven, "Bulk Water Exports: Environmental Concerns and Business Realities," n.d., 3; Barlow, "THE GLOBAL TRADE IN WATER from the Booklet Blue Gold The Global Water Crisis and the Commodification of the World's Water Supply A Special Report Issued by the International Forum on Globalization (IFG)."	
France	Spain (Barcelona)	Inactive	2008	Tanker/Ship	Philosophy 2	Szwedo, <i>Cross-Border Water Trade</i> , 144; Temmerman, <i>Bulk Fresh Water Resources and the GATT</i> , 2017, 4; Shukman, "Ships Bring Water to Parched Barcelona."	
United States (Alaska)	Japan	Unknown	Unknown	Unknown	Philosophy 2	Gleick, <i>The World's Water: The Biennial Report on Freshwater Resources 2002-2003</i> , 3:45.	
Vietnam	Japan	Unknown	Unknown	Unknown	Philosophy 2	Gleick, <i>The World's Water: The Biennial Report on Freshwater Resources 2002-2003</i> , 3:45.	
South Korea	Japan	Unknown	Unknown	Unknown	Philosophy 2	Gleick, <i>The World's Water: The Biennial Report on Freshwater Resources 2002-2003</i> , 3:45.	
Hong Kong	Japan	Unknown	Unknown	Unknown	Philosophy 2	Gleick, <i>The World's Water: The Biennial Report on Freshwater Resources 2002-2003</i> , 3:45.	
China	Japan	Unknown	Unknown	Unknown	Philosophy 2	Gleick, <i>The World's Water: The Biennial Report on Freshwater Resources 2002-2003</i> , 3:45.	
Greece	Republic of Cyprus (City of)	Inactive	2008	Tanker	Philosophy 2	Temmerman, <i>Bulk Fresh Water Resources and the GATT</i> , 2017, 4.	
China	Taiwan	Active	2020	Ship	Philosophy 2	BBC News, "Taiwan to Buy Water from China," BBC News, May 3, 2002, <a href="http://news.bbc.co.uk/2/hi/asia-pacific/1966479.stm">http://news.bbc.co.uk/2/hi/asia-pacific/1966479.stm</a> .	
Syria	Jordan	Active	1987	Dam/Reservoir	Philosophy 3	Szwedo, <i>Cross-Border Water Trade</i> , 158.	* Executed according to Article 7 of the 1987 Agreement Concerning the Utilization of the Yarmuk Waters (with Annex) between the Syrian Arab Republic and Jordan, which is based on Article 8 of the 1953 Agreement Between the Republic of Syria and the Hashemite Kingdom of Jordan Concerning the Utilization of the Yarmuk Waters. See: Szwedo, <i>Cross-Border Water Trade</i> , 158.
Kyrgyzstan	Kazakhstan	Unknown	1998	Unknown	Philosophy 3	Szwedo, <i>Cross-Border Water Trade</i> , 159.	
Kyrgyzstan	Uzbekistan	Unknown	1998	Unknown	Philosophy 3	Szwedo, <i>Cross-Border Water Trade</i> , 159.	
United States	Mexico	Active	1966	Reservoir	Philosophy 3	Szwedo, <i>Cross-Border Water Trade</i> , 174.	
Unknown	South Korea	Unknown	Unknown	Tanker	Unknown	James McNiven, "Bulk Water Exports: Environmental Concerns and Business Realities," n.d., 3; Barlow, "THE GLOBAL TRADE IN WATER from the Booklet Blue Gold The Global Water Crisis and the Commodification of the World's Water Supply A Special Report Issued by the International Forum on Globalization (IFG)."	
Unknown	Taiwan	Unknown	Unknown	Tanker	Unknown	James McNiven, "Bulk Water Exports: Environmental Concerns and Business Realities," n.d., 3; Barlow, "THE GLOBAL TRADE IN WATER from the Booklet Blue Gold The Global Water Crisis and the Commodification of the World's Water Supply A Special Report Issued by the International Forum on Globalization (IFG)."	
France/Algeria	France/Algeria	Unknown	Unknown	Unknown	Unknown	Stefano Ambrogi, "Tankers May Ship Water to Parched Cities of Future," Reuters, February 2, 2007, <a href="https://www.reuters.com/article/us-globalwarming-water-idUSL0211543720070202">https://www.reuters.com/article/us-globalwarming-water-idUSL0211543720070202</a> .	*Not clear whether France or Algeria is the exporter or importer
United States (Texas)	Curacao	Inactive	1960s	Tanker	Unknown	Gleick, <i>The World's Water: The Biennial Report on Freshwater Resources 2002-2003</i> , 3:44.	

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Exporter	Importer	Status	Date (Year/Decade) Initiated	Means of Trade	Approach to Water Trade	Source(s)†	Notes (*)
Dominica	Aruba	Inactive	Unknown	Unknown	Unknown	Gleick, <i>The World's Water: The Biennial Report on Freshwater Resources 2002-2003</i> , 3:44.	
Unknown	Virgin Islands	Active	Unknown	Barge/Boat	Unknown	Szwedo, <i>Cross-Border Water Trade</i> , 143; Luther Harris Evans, "Virgin Islands," Encyclopedia Britannica, September 10, 2020, <a href="https://www.britannica.com/place/Virgin-Islands">https://www.britannica.com/place/Virgin-Islands</a> .	
Australia	Nauru	Unknown	Unknown	Unknown	Unknown	Gleick, <i>The World's Water: The Biennial Report on Freshwater Resources 2002-2003</i> , 3:45.	
New Zealand	Nauru	Unknown	Unknown	Unknown	Unknown	Gleick, <i>The World's Water: The Biennial Report on Freshwater Resources 2002-2003</i> , 3:45.	
Fiji	Nauru	Unknown	Unknown	Unknown	Unknown	Gleick, <i>The World's Water: The Biennial Report on Freshwater Resources 2002-2003</i> , 3:45.	
Unknown	Tonga	Inactive	1990s	Barge/Boat	Unknown	Gleick, <i>The World's Water: The Biennial Report on Freshwater Resources 2002-2003</i> , 3:118; Szwedo, <i>Cross-Border Water Trade</i> , 143.	
Unknown	Fiji	Unknown	Unknown	Barge/Boat	Unknown	Gleick, <i>The World's Water: The Biennial Report on Freshwater Resources 2002-2003</i> , 3:118; Szwedo, <i>Cross-Border Water Trade</i> , 143.	
Unknown	The Bahamas	Unknown	As Needed	Barge/Boat	Unknown	Barlow, "THE GLOBAL TRADE IN WATER from the Booklet Blue Gold The Global Water Crisis and the Commodification of the World's Water Supply A Special Report Issued by the International Forum on Globalization (IFG)," Gleick, <i>The World's Water: The Biennial Report on Freshwater Resources 1998-1999</i> , 1:200.	
United States (Alaska)	Japan	Inactive	1995	Tanker	Unknown	Barlow, "THE GLOBAL TRADE IN WATER from the Booklet Blue Gold The Global Water Crisis and the Commodification of the World's Water Supply A Special Report Issued by the International Forum on Globalization (IFG)," Gleick, <i>The World's Water: The Biennial Report on Freshwater Resources 1998-1999</i> , 1:200.	
The Netherlands	Unknown	Unknown	Unknown	Tanker	Unknown	Ministerial Committee Examining the Export of Bulk Water, "Export of Bulk Water from Newfoundland and Labrador: A Report of the Ministerial Committee Examining the Export of Bulk Water."	
United Kingdom (Scotland)	Spain (Mallorca)	Unknown	As Needed	Barge/Boat	Unknown	Szwedo, <i>Cross-Border Water Trade</i> , 144; Ulrich Küffner, "Contested Waters: Dividing or Sharing?," in <i>Water in the Middle East: Potential for Conflicts and Prospects for Cooperation</i> , n.d., 79, <a href="https://illiad.library.georgetown.edu/shibb/illiad.dll?Action=10&amp;Form=75&amp;Value=591969">https://illiad.library.georgetown.edu/shibb/illiad.dll?Action=10&amp;Form=75&amp;Value=591969</a> .	
						†See Bibliography in the previous section for additional reference information	* Clarifying information, See: Footnote 157 in main text