

Water Markets and the U.N. Watercourses Convention

JENNIFER CHAU*

ABSTRACT

Earth's growing population coupled with limited water resources and climate change create an urgent need for developing innovative water management methods. A leading solution is to characterize water as an economic good and develop water markets where states can buy and sell water rights. However, commentator and economists argue that for the water markets solution to be viable, a legal framework is necessary to provide a clear definition of property rights and allocation, which does not merely stop at establishing who gets what and how much, but how the resources will be managed, who will make the decisions, which procedures will be used, and which principles will be controlling. One such framework that is currently available is the United Nations Convention on the Law of the Non-navigational Uses of International Watercourses, adopted in 1997 and entered into force on August 17, 2014. Even before entering into force, the U.N. Watercourses Convention commanded great respect in the international community as a codification of customary international law in the field of international water law. Despite this esteem, it is still important to ask whether the Convention's principles sufficiently define property rights and allocation to allow the development and functioning of water markets.

The fundamental and contentious elements of the U.N. Watercourses Convention are its consultation and prior notification provision, principle of equitable and reasonable use, obligation not to cause significant harm, and introduction of the "vital human needs" term. Under these principles, the U.N. Watercourses Convention requires that to determine whether a water use is permitted by the Convention, the planned use must be submitted to other watercourse states for approval. Its benefits must be weighed against any negative impacts on other watercourse states to determine whether that state is fulfilling its obligations under the Convention for equitable and reasonable use and to not cause significant harm to other watercourse states while giving special regard to vital human needs. Unfortunately, these principles make it difficult to establish and maintain water markets. Water markets require firm, well-defined water rights, but the fact-specific fluid nature of the Convention's equitable and reasonable use determination does not provide consistent, well-defined water rights. In addition,

* J.D. Candidate 2015, Georgetown University Law Center. © 2015, Jennifer Chau.

the prior notification provision exacerbates the uncertainty of rights as it subjects all water market transactions to the consultation and approval of other water-course states.

However, water markets may still be established under the Convention so long as vital human needs are not implicated and adverse effects of the use are kept to a minimum—or are outweighed by benefits such as efficiency and environmental protection. The U.N. Watercourses Convention allows for fluidity in the determination of water rights, but because the balancing factors remain consistent, the determination of water rights is consistent enough to give water markets the well-defined rights they need to function.

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INTRODUCTION

Water is a contentious commodity.¹ Although water covers about 70 percent of the Earth's surface,² only about 2.5 percent of Earth's water is fresh,³ and less than 1 percent of that amount can be renewed.⁴ Humans need freshwater to

1. See Jonathan H. Adler, *Warming Up to Water Markets*, REGULATION, Winter 2008-2009, at 14.

2. U.S. DEP'T OF THE INTERIOR, *How Much Water is There On, In, and Above the Earth?*, UNITED STATES GEOLOGICAL SURVEY, <http://water.usgs.gov/edu/earthhowmuch.html> (last modified Mar. 19, 2014).

3. PAC. INST., *Water Fact Sheet Looks at Threats, Trends, Solutions*, PACIFIC INSTITUTE (May 23, 2010), <http://pacinst.org/publication/facts-on-the-worlds-water/>.

4. *Id.*

survive,⁵ and the small global supply of water combined with high demand and growing global population has impacted many water-scarce regions. Such regions include the Middle East, where disagreements over the usage rights of the Jordan, Tigris, Euphrates, and Nile Rivers have spurred ongoing conflicts.⁶ The changing climate has not helped the current water scarcity situation because it adds more uncertainty to the future; despite certainty that the warming of the atmosphere will cause *some* change to the distribution and availability of water, the exact nature, magnitude, timing, and distribution of this change remains a mystery.⁷ This is a problem in which past conditions are not reliable factors to predict and plan for future conditions. Instead, a more flexible and adaptable system is necessary to effectively keep up with ever-changing conditions and their impacts on global water resources. For this, experts suggest the use of water markets.⁸

Experts recommend water markets over administrative alternatives as a solution to the water scarcity problem for three reasons: (1) water markets are flexible due to their pricing mechanism; (2) they mitigate uncertainty; and (3) they accurately provide difficult-to-obtain information on people's preferences.⁹ However, to function effectively, water markets require water rights that are secure.¹⁰ The relevant law currently governing the non-navigational use of international waters is the U.N. Watercourses Convention, entered into force this past year,¹¹ but its language regarding water rights is quite fluid.

This note will explore whether the Convention provides sufficiently secure water rights to allow water markets to function. First, the main reasons supporting how water markets solve the water scarcity problem will be discussed, followed by a brief explanation of water markets. Next, the main principles of the U.N. Watercourses Convention will be explained along with the articles that contend with the development of water markets. Finally, three possible types of water markets will be introduced, and a case study analysis will apply the potentially problematic articles to the three hypothetical variations of water markets to see what, if any, issues arise. The first type of water market involves the trading of water between a non-riparian state and a riparian state; the second

5. *Id.*

6. See Hannu Juusola, *Water Conflicts in the Middle East*, INT'L RELATIONS & SEC'Y NETWORK (Oct. 18, 2012), <http://www.isn.ethz.ch/Digital-Library/Articles/Special-Feature/Detail/?id=153761&contextid774=153761&contextid775=153757&tabid=1453348906>.

7. Adler, *supra* note 1, at 15.

8. See *id.*; see also ALINE BAILLAT, INTERNATIONAL TRADE IN WATER RIGHTS: THE NEXT STEP 41, 141 (2010).

9. See Adler, *supra* note 1, at 14-15.

10. See *id.* at 15.

11. See UNITED NATIONS, Status of Convention on the Law of the Non-Navigational Uses of International Watercourses, https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-12&chapter=27&lang=en#1 (last visited Dec. 21, 2014).

type involves trade within one riparian state; and the third involves trade between two riparian states.

I. BACKGROUND: WHY DISCUSS WATER MARKETS?

A. FLEXIBILITY DUE TO RELIANCE ON PRICE

Commentators and economists argue that water markets are the solution to meet the demands of changes in water availability because of their flexibility to adapt to changes, including uncertain impacts on water supplies caused by climate change, and to allocate water to its highest-value use.¹² Markets have always been powerful institutions for resource allocation,¹³ and may allocate water with an adaptable and flexible supply and demand mechanism.¹⁴ When users pay for the resource, their actions reflect a personal tradeoff between the cost of obtaining additional water, the cost of reducing or conserving water use, and other relevant factors. The user that values obtaining additional water the most will buy more, while the user that values the amount gained from selling additional water will conserve water to sell more.¹⁵ This results in efficient use and management of limited water supplies because the highest-value user presumably has the highest value use of the water in mind.¹⁶ Prices adjust to market conditions, which in turn causes the buyers and sellers to adjust their preferences accordingly. Thus, even if changes are uncertain and unpredictable, the market is flexible and will adjust through its supply and demand pricing mechanism. An alternative solution, such as the use of an administrative agency, would not have the same agility as water markets in efficiently responding and adjusting to current events and prices.¹⁷

B. MITIGATION OF UNCERTAINTY

In addition to being flexible and adaptable, the market system reduces uncertainty for buyers and sellers, which decreases the high associated costs. These high costs include preparation for water management projects—such as building dams and factories—that may be thwarted by unexpected changes stemming from climate change reducing or changing water flow, the anticipation of certain changes that never materialize, or the failure to effectively prepare for

12. See Adler, *supra* note 1, at 15.

13. *Id.*

14. BAILLAT, *supra* note 8, at 321.

15. See Adler, *supra* note 1, at 16.

16. *Id.*

17. FED. HIGHWAY ADMIN., ECONOMICS: PRICING, DEMAND, AND ECONOMIC EFFICIENCY—A PRIMER (2008) 11, available at http://ops.fhwa.dot.gov/publications/fhwahop08041/cp_prim4_04.htm (last modified Sept. 22, 2014) (“Under most circumstances, the setting of prices in markets through the interaction of consumers and producers can help achieve an efficient outcome.”).

changes that do occur.¹⁸ These high costs make it difficult to plan and justify expensive new projects, discouraging innovative thought and development in water management facilities and methods.¹⁹

Water markets can also reduce and secure users against uncertainty costs.²⁰ For example, in regions suffering from drought, if water users are able to purchase additional water rights from other users, the costs of preparing for and managing drought conditions shift to users who are better equipped to bear them.²¹ When costs vary, they can shift to users able to mitigate drought conditions at the lowest cost, such as those already equipped with structures and plans to handle droughts.²² Overall costs caused by the drought conditions will be reduced. Water supplies then go to the highest-valued uses, which is economically efficient.²³

In addition, the ability to transfer water rights in the water market before potential changes in supply allows water users to reallocate the risk of uncertainty.²⁴ Water users can buy water options that will ensure water in the future if the need arises from unexpected changes in supply. Similar to commodity markets, such options will help users manage risk and reduce the costs of both expected and unexpected negative events caused by factors including climate change and natural disasters.²⁵

C. ACCESS TO INFORMATION

Because markets are driven by supply and demand and prices change as each user acts, water markets generate and reflect important information about people's preferences that otherwise would be difficult to collect.²⁶ In this way, water markets are a better choice for managing water than other water management alternatives, such as management through the use of an administrative agency.²⁷ Markets have access to specialized information that is effective in efficiently allocating water supplies; markets use voluntary exchange and information about relative scarcity and demand to allocate supplies.²⁸ Users' behavior and decisions give markets access to localized and dispersed information about

18. *Id.*

19. See EDITH BROWN WEISS, *INTERNATIONAL LAW FOR A WATER-SCARCE WORLD* 60-61, 243 (2013); cf. Adler, *supra* note 1, at 14 (indicating that a shift to market pricing will "improve the management of water supplies, ensure more efficient allocation of available supplies, and encourage cost-effective conservation measures").

20. FED. HIGHWAY ADMIN., *supra* note 17.

21. See Adler, *supra* note 1, at 16.

22. *Id.*

23. See FED. HIGHWAY ADMIN., *supra* note 17, at 17; Hope Babcock, *Reserved Indian Water Rights in Riparian Jurisdictions: Water, Water*, 91 CORNELL L. REV. 1203, 1231-32 (2006).

24. FED. HIGHWAY ADMIN., *supra* note 17, at 17.

25. *Id.*

26. *Id.* at 16.

27. *Id.*

28. *Id.*

resource supplies and demands, including subjective valuations and individualized uses for different resources in different places.²⁹ Water markets are more powerful than administrative alternatives in gathering information effectively to efficiently allocate water and to provide a more equitable means of water transfer.³⁰

Water markets provide a more equitable way of transferring water than administrative alternatives because water is transferred through voluntary transactions between buyers and sellers. Those who had unwanted or unneeded water rights are compensated for giving them up, while others can obtain the water for which they are willing to pay. Commentators claim that while there will still be third parties that suffer indirect effects from the water transfer in water markets, third parties will suffer indirectly under any method of water transfer.³¹ Proponents of water markets assert that while third parties suffer indirectly from almost any water transfer methods, such losses will be exacerbated by the public harms resulting from inefficient water allocation and waste if water markets are not used.³²

II. ISSUE: CAN WATER MARKETS BE ESTABLISHED AND FUNCTION UNDER THE CURRENT U.N. WATERCOURSES CONVENTION?

Water markets are currently utilized in some areas, such as in the western part of the United States³³ and in Chile,³⁴ and water markets may be the solution to managing the use of the world's limited water supply.³⁵ If current water supply and demand trends continue and no new alternative is offered, many commentators recommend an increase in the use of water markets.³⁶ Others argue that although water markets are efficient, the implications associated with considering water as an economic good may outweigh market benefits.³⁷ They point out that water differs from other economic goods because it is essential to human survival, and water markets may jeopardize a basic human right to water.³⁸ Water markets allow the rich to have rights to water at the expense of others.³⁹ There are also environmental implications: Although water markets seem to put water to its most efficient and highest-value use, they may also cause problems in disrupting

29. *Id.*

30. *Id.* at 17.

31. *See id.*

32. *Id.*

33. *Id.* at 15.

34. BAILLAT, *supra* note 8, at 328.

35. *See* Adler, *supra* note 1, at 14.

36. *See* BAILLAT, *supra* note 8, at 340-41.

37. *See* WEISS, *supra* note 19, at 244-45.

38. *Id.*

39. *Id.*

ecosystems if such use calls for severing water from land.⁴⁰

However, regardless of whether they support the use of water markets, many commentators agree that to implement water markets and enjoy the benefits of their flexibility and adaptability, water rights must paradoxically be well-defined and rigid.⁴¹ “Property rights in water are the foundation for water markets” and their extent and limitations determine how a potential market may operate.⁴² Only if water rights are well defined, enforceable, and transferable will states be able to effectively sell water rights to each other.⁴³ This facilitates the voluntary exchanges and market pricing of water resources, which in turn allows for the efficient allocation of water resources to the highest-value use.⁴⁴ The clear definition and recognition of transferable rights in water are crucial to a well-functioning water market system and thus necessary to enjoy its benefits.

While there are conflicting ideas about what constitutes a satisfactory definition of water rights—from distinguishing between definitions of ownership rights versus usage rights⁴⁵—there is a general consensus that any agreement between parties should first define the exact nature of the property regime.⁴⁶ One commentator argues that defining disputed water resources as common property is an essential initial step before introducing water markets.⁴⁷ One guideline to follow for developing well-defined property and allocation rights is that the definition should not determine who gets what, but rather should focus on the following inquiries: how the resources will be managed, who makes the decisions on which resources, which procedures will be used, and which principles will be controlling.⁴⁸ Before implementation, states must agree on an institutional framework to define the rules and parameters of and regulations for the water market because without firm guidelines and rights, states may not be accountable to their promises of purchase and sales, which in turn would make the entire market system unreliable and thus ineffective.⁴⁹

One leading legal framework currently in place is the United Nations Convention on the Law of the Non-navigational Uses of International Watercourses, adopted in 1997 and in force since August 2014.⁵⁰ According to its terms on scope, the U.N. Watercourses Convention “applies to [the] uses of international

40. *Id.* at 58-60, 189, 243-84.

41. *See id.* at 59.

42. Adler, *supra* note 1, at 15.

43. *Id.*

44. *Id.*

45. BAILLAT, *supra* note 8, at 340.

46. *Id.*

47. *Id.*

48. *Id.* at 341.

49. *Id.*

50. *See* UNITED NATIONS, Status of Convention on the Law of the Non-Navigational Uses of International Watercourses, https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-12&chapter=27&lang=en#1 (last visited Dec. 21, 2014).

watercourses and [] their waters for purposes other than navigation[,] and to measures of protection, preservation, and management related to the uses of those watercourses and their waters.”⁵¹ The Convention commanded great respect from the international community even before entering into force on August 17, 2014.⁵² As there are very few pre-existing rules of customary international law in the field of international water law, the Convention is considered a significant advancement in the development of the field.⁵³ Negotiated on the basis of a draft prepared by the International Law Commission, the U.N. organization responsible for the codification and progressive development of international law, the Convention can be considered a codification of customary international law in the field of international water law.⁵⁴ In addition, the Convention was negotiated in a relatively open forum in which any interested state could be involved,⁵⁵ and it received a heavy majority of favorable votes in the General Assembly with 103 votes in favor, 3 against (from China, Burundi, and Turkey), and 27 abstaining.⁵⁶

The Convention has influenced regional negotiations and treaties, as well as international cases both during its drafting and since its conclusion.⁵⁷ The 1995 Mekong Agreement was based on the work of the International Law Commission on which the Convention is based.⁵⁸ Since the Convention’s conclusion, it has played a role in the negotiations between Israel and Palestine over their shared water resources, and in the negotiation of many treaties including the 2000 Southern African Development Community (“SADC”) Revised Protocol, the Senegal River Water Charter, and the Nile River Basin Cooperative Framework Agreement.⁵⁹ The influence of the Convention is especially apparent in the SADC Revised Protocol.⁶⁰ In addition, even before entering into force, the U.N. Watercourses Convention was often referenced by important bodies such as the International Court of Justice.⁶¹ In fact, the International Court of Justice referred

51. Convention on the Law of the Non-Navigational Uses of International Watercourses, G.A. Res. 51/229, Annex, U.N. Doc. A/RES/51/229, art. 1, ¶ 1 (May 21, 1997) [hereinafter U.N. Convention].

52. UNITED NATIONS, Status of Convention on the Law of the Non-Navigational Uses of International Watercourses, https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-12&chapter=27&lang=en#1 (last visited Nov. 3, 2014); see Stephen C. McCaffrey, *The 1997 U.N. Watercourses Convention: Retrospect and Prospect*, 21 PAC. MCGEORGE GLOBAL BUS. & DEV. L.J. 165, 170-71 (2008); Carolin Spiegel, Note, *International Water Law: The Contributions of Western United States Water Law to the United Nations Convention on the Law of the Non-Navigable Uses of International Watercourses*, 15 DUKE J. COMP & INT’L L. 333, 345 (2005).

53. Spiegel, *supra* note 52 at 344.

54. McCaffrey, *supra* note 52, at 170; Spiegel, *supra* note 52, at 344-45.

55. McCaffrey, *supra* note 52, at 345.

56. *See id.* at 340, 344.

57. *See* McCaffrey, *supra* note 52, at 170.

58. *Id.* at 171.

59. *Id.*

60. *Id.*

61. *See* Spiegel, *supra* note 52, at 361.

to the Convention several times in its Gabčíkovo-Nagymaros Project case judgment even though the Convention had been concluded only four months prior.⁶²

Because of the significant role that the Convention has played in international water law, some argue that it was considered legitimate and effective even before it entered into force.⁶³ Now that it has entered into force, states will likely continue to draw on its principles and language for international watercourse treaties.⁶⁴ Thus, in order to assess whether international water law is compatible or conducive to the establishment and use of water markets, it is crucial to analyze the compatibility of water market systems with the general principles and procedures within the terms of the U.N. Watercourses Convention. Do the principles and terms of the U.N. Watercourses Convention support the establishment of efficient water markets?

The fundamental elements of the U.N. Watercourses Convention are its consultation and prior notification provision, the principle of equitable and reasonable use, the obligation not to cause significant harm, and the introduction of the “vital human needs” term.⁶⁵ These elements work together to encourage cooperation and communication among watercourse states.⁶⁶ The consultation and prior notification provision requires that watercourse states consult, notify, and obtain consent from other watercourse states for any potential projects that will affect the watercourse before proceeding with the project.⁶⁷ The U.N. Watercourses Convention limits any water use by states to “equitable and reasonable uses,” which is determined by considering a list of factors provided in Article 6.⁶⁸ In addition to being limited to equitable and reasonable uses, states have a further obligation to not cause significant harm to other watercourse states.⁶⁹ Although certain uses are not inherently more important than others, special regard must be given to “vital human needs.”⁷⁰ Under these principles, to determine whether a planned water use is permitted by the Convention, it must be submitted to other watercourse states for approval, and its benefits must be weighed against any negative impacts on other watercourse states.⁷¹ This is to determine whether that state is fulfilling its obligations under the Convention of

62. McCaffrey, *supra* note 52, at 170.

63. *See id.* at 171.

64. *See id.* at 172.

65. *See* Spiegel, *supra* note 52, at 345. *See generally* U.N. WATERCOURSES CONVENTION—ONLINE USER’S GUIDE, Article 10, 10.1.1 Vital Human Needs, U.N. WATERCOURSES CONVENTION ONLINE USER’S GUIDE (Apr. 26, 2014), <http://www.unwatercoursesconvention.org/the-convention/part-ii-general-principles/article-10-relationship-between-different-kinds-of-uses/10-1-1-vital-human-needs/>.

66. *See* U.N. Convention, *supra* note 51, art. 5, 7, 10-12.

67. *See id.* art. 11-12, 14.

68. *See id.* art. 5-6.

69. *See id.* art. 7.

70. *Id.* art. 10.

71. *See id.*

equitable and reasonable use and of not causing significant harm to other watercourse states, while also giving special regard to vital human needs.⁷²

Critics of current water law assert that water markets raise issues that the U.N. Watercourses Convention and related international agreements have not contemplated.⁷³ The most important issue is the determination of which states and uses have priority over others and when such priority occurs. The terms of the Convention provide that "equitable and reasonable" uses, ambiguously determined by balancing factors specified in the relevant Convention article, prevail over other uses.⁷⁴ Whether a given use is equitable and reasonable may change in response to a change in the mix of factors, a fluidity intended by the provision.⁷⁵ Markets, on the other hand, rely upon secure property rights in order to work, which seems to pose a problem under the Convention. The Convention expressly anticipates changing allocations among countries in response to the rise of new factors, which may be in direct conflict with the secure and well-defined property rights that are essential to the success of water markets.⁷⁶

The Convention may limit the private contracting of water through its prior notification provision by affecting the formation of contracts, as discussed below. This adds to the uncertainty of rights since it subjects all water market transactions to the consultation and approval of other watercourse states.⁷⁷ Consultation and approval makes it difficult for the development and establishment of water markets since the success of water markets depends on the ability of states to form and honor private agreements with one another regarding water resources.⁷⁸

To determine whether water markets can be established under the principles of the U.N. Watercourses Convention, this note analyzes three types of markets: a market between a riparian state and a non-riparian state, a market within one riparian state (a riparian domestic market), and a market between two riparian states along the same watercourse. Hypothetical conditions and details of each market will be explained and stipulated, and the four main principles of the U.N. Watercourses Convention will be applied to each. Compatibility with the U.N. Convention turns on the question of whether the transaction has sufficiently minimal adverse effects on other watercourse states to still be deemed equitable and reasonable. Thus, the compatibility analysis of all three markets with the U.N. Convention will combine into a single test for conflicts with the U.N. Convention's principles of prior notification, equitable and reasonable utilization, no significant harm, and special regard to vital human needs.

72. *See id.*

73. WEISS, *supra* note 19, at 59.

74. *See id.* at 246-47.

75. *Id.*

76. *Id.*

77. *See* U.N. Convention, *supra* note 51, art. 11-12, 14.

78. *See* BAILLAT, *supra* note 8, at 45-46.

III. CASE STUDY ANALYSIS OF THREE MARKETS WITH RESPECT TO THE U.N. CONVENTION

A. THREE WATER MARKETS

1. Non-riparian–Riparian

One potential water market is between a non-riparian state and a riparian state in which the riparian state sells its water use rights to the non-riparian state. In other words, the non-riparian state will value the use of the water more than the riparian state. This may not mean that the non-riparian state will literally be using the water because this market includes two types of transactions: one in which there will be transportation of water from the riparian state to the non-riparian state, and one in which there will not be transportation of water.⁷⁹

One possible type of transaction between a non-riparian state and a riparian state is one in which the “good” being sold on the water market is not necessarily water itself as a good, but rather the effects of water use.⁸⁰ In this type of transaction, the non-riparian state is not buying water literally, and there is no transportation of water from the riparian state to the non-riparian state.⁸¹ For example, the non-riparian state funds the riparian state to develop efficient technology to harness the power of water to generate electricity, which would then be shared with the non-riparian state. The non-riparian state would essentially be buying the electricity that resulted from the use of the water that is accessible by the riparian state and that usage would be the “good” being sold on this water market.

Another type of water market transaction between a non-riparian state and a riparian state is one in which water is transported from the riparian state to the non-riparian state.⁸² Suppose the non-riparian state is a wealthier state with a growing population and needs additional water to sustain itself, while the riparian state is a poorer state with water resources. Because the riparian state is less wealthy, it has not developed technology to efficiently use its water resources and thus has been wasting much of its water supply.⁸³ Using the water market, the non-riparian state could agree to fund the riparian state’s research and development in technology, efficient use, and efficient allocation of its water resources in return for a quantity of water—which the non-riparian state could use toward its own agriculture, economy, and population.⁸⁴ The result of this transaction includes not only the transportation of water from one state to another but also the

79. See generally WEISS, *supra* note 19, at 58-61.

80. See generally *id.*

81. See generally *id.*

82. See generally *id.*

83. See generally *id.*

84. See generally *id.* at 58-61, 189.

development in efficient water use technology and methods and an overall benefit of more efficient water use and allocation.⁸⁵

The riparian state could also accept general funds instead of exchanging the transportation of its water for technology.⁸⁶ In this transaction, there would be no direct result of technological development or efficient use of water. However, it is possible that the prospect of being able to sell water to the non-riparian state may give the riparian state an incentive to develop better technology and more efficient methods of using its water supplies, which would also result in an overall benefit of more efficient use of water resources.⁸⁷

Water market transactions between a non-riparian state and a riparian state could be structured in a variety of ways. Their validity under the U.N. Convention turn on whether the benefits resulting from the transactions—such as technological development, efficient water use, and electricity generation in the above scenarios—can make the water use equitable and reasonable as compared to the effects of the transactions on other watercourse states, regardless of whether they are parties to the transactions.⁸⁸

2. Within One Riparian: The Riparian Domestic Market

Another potential water market is one in which a riparian state sells its water rights within its own borders. This market is essentially a variation of the non-riparian-riparian market in that a party with access to water (“riparian”) is selling its water rights to another party in the same state that does not have access to water (“non-riparian”).

In this market situation, a company may wish to bottle and sell natural spring water. Suppose there is a company seeking to buy rights to use water resources from the riparian state government.⁸⁹ The company plans to bottle the water and sell it in the domestic market of the riparian state.⁹⁰ However, the current condition of the riparian state’s water supply is poor, and the government does not use its water supplies at either an efficient or environmentally-friendly level, resulting in wasted water every year. In fact, the riparian state suffers from water shortages each year due to its wasteful practices, but investing in technology and methods that more efficiently use and allocate water resources would convert the water shortage into a water surplus.

With a water market, the company could contract with the riparian state to help fund the state’s research and development into technology to help the

85. *See generally id.*

86. *See generally id.*

87. *See generally id.*

88. *See generally id.* at 58-61, 189, 245.

89. *See generally id.*

90. *See generally id.*

state develop more efficient water management practices.⁹¹ In exchange, the state would give the company rights to bottle and sell water that would become available due to the technology and method developed and implemented. The company receives rights to obtain and sell its product while the state is able to research and develop new innovative technologies, allowing it to manage its water resources more effectively and efficiently.

Another transaction that could occur in a riparian state's domestic water market is the government sale of water rights to its farmers to help sustain agriculture.⁹² However, this sale may result in an oversupply of water to the farmers due to the state's overzealousness in trying to ensure its farmers receive enough water to sustain the agricultural sector. This, in turn, may lead to the sale of the water rights from the farmers to "thirsty cities": highly populated cities suffering from water shortages.⁹³ Water markets would allow the riparian state's farmers to sell their water rights to thirsty cities and thus encourage efficient water use in the agricultural sector.⁹⁴ Farmers would contract with thirsty cities to sell their water rights and would have incentives to use their water supplies more efficiently.⁹⁵ Properly incentivized farmers would transform water waste into conservation of supply for sale later.⁹⁶

Thus, water market transactions between non-riparian and riparian states may be structured in a variety of different ways, even within a single state. However, whether the U.N. Convention would permit these transactions again turns on analyzing the effects the transactions would have on other watercourse states, even if the other watercourse states are not necessarily parties to the transaction in question.

3. Riparian–Riparian

Another kind of water market could be established between two riparian states along the same watercourse:⁹⁷ an upper-riparian state ("Upper"), and a lower-riparian state ("Lower"). Suppose Upper has a growing population and is highly dependent on agriculture. Agriculture is a substantial part of its economy, and a highly water-intensive crop is one of Upper's main sources of income. Lower, the lower-riparian neighbor of Upper, also has a growing population and is dependent on agriculture for a substantial amount of its economy. In addition, Lower is wealthier than Upper. Suppose further that Upper's current use of its water supplies is so wasteful that it substantially decreases the flow of the water

91. *See generally id.*

92. Adler, *supra* note 1, at 16.

93. *Id.*

94. *Id.*

95. *Id.*

96. *Id.*

97. *See generally* WEISS, *supra* note 19, at 58-61, 189, 245.

downstream, leaving barely enough for Lower and other neighbors further downstream. Upper's use is polluting the water, which flows downstream, also affecting Lower's ability to use the water.

Using water markets, Lower contracts with Upper to help fund Upper's research and development technology to help Upper be more environmentally-friendly and to use and allocate its water resources more efficiently.⁹⁸ In return, Upper guarantees Lower a specific amount of water at a specified level of cleanliness made possible due to the use of new technology in conserving water and maintaining water quality. This transaction results in more efficient allocation and use of water supplies, and the technology and methods may be implemented elsewhere to encourage and assist other states to also improve their efficiency in water management.

As in the other circumstances, there is a variety of ways that water market transactions between two riparian states may be structured. However, whether the U.N. Convention supports these transactions again turns on analyzing the effects that the transactions would have on the watercourse states involved in the specific transaction and other watercourse states which are not necessarily parties to the transaction in question.

B. APPLYING THE PRINCIPAL ELEMENTS OF THE U.N. CONVENTION

Whether each of the three variations of water markets is compatible with the U.N. Convention will ultimately turn on whether the transaction will be deemed equitable and reasonable, even if it is between two riparian states. In other words, compatibility with the U.N. Convention turns on the degree of certainty in establishing rights in each transaction. The compatibility analysis of each of the three markets with the U.N. Convention combines into a single test to determine any conflicts with the U.N. Convention's guiding principles of prior notification, equitable and reasonable use, no significant harm, and special regard to vital human needs.

1. Prior Notification: Articles 11, 12, and 14

Article 11 of Part III of the U.N. Watercourses Convention requires that watercourse states exchange information, consult with each other, and "if necessary, negotiate on the possible effects of planned measures on the condition of an international watercourse."⁹⁹ Article 12 stipulates that before a watercourse state "permits the implementation of planned measures which may have a significant adverse effect upon other watercourse States, it shall provide those

98. *See generally id.*

99. *See* U.N. Convention, *supra* note 51, art. 11.

States with timely notification thereof.”¹⁰⁰ Article 14 states that the notifying state “shall not implement or permit the implementation of the planned measures without the consent of the notified States.”¹⁰¹ Thus, under these articles, the U.N. Watercourses Convention stipulates that a watercourse state must consult with other watercourse states about planned measures, is required to give prior notification if there will be significant adverse effects, and must have the consent of the notified states before proceeding with any planned measures.¹⁰²

These articles are not conducive to the establishment of water markets because they significantly limit the ability of states to enter into the private contracts necessary for water markets to work. In all three scenarios, before any agreement can be carried out, consultation and consent must be received from the other watercourse states.¹⁰³ This makes it difficult for contracts to be carried out as it increases uncertainty in the rights of the water. It also increases the likelihood that parties will breach their contracts, especially in non-riparian–riparian agreements where only the riparian party is subject to this requirement under the U.N. Watercourses Convention. Thus, this element of the Convention produces disincentives to enter into private water market agreements.

One possible solution to this problem is for the contracting parties to make separate agreements with all affected watercourse states so that they may consent to the original agreement; but this would also be difficult, thus discouraging the formation of private contracts regarding water use. It is important to note that a watercourse state can decline to consent due to the agreement being inconsistent with Articles 5 or 7,¹⁰⁴ and a state may proceed with its planned measures when it receives no communication from a notified state—but only if the agreement is consistent with articles 5 and 7.¹⁰⁵ Thus, complying with Articles 5 and 7 regarding equitable and reasonable use and obligation not to cause significant harm respectively may be a possible method to circumvent the issue that the prior notification and consultation provision poses for water markets.

2. Equitable and Reasonable Use: Articles 5 and 6

Articles 5 and 6 of the U.N. Watercourses Convention—including “equitable and reasonable utilization and participation” and “factors relevant to equitable and reasonable utilization,” respectively—are the first of a series of articles in Part II of the U.N. Watercourses Convention that discuss the general principles of the Convention and provide the basic allocation rules.¹⁰⁶ Article 5 provides for

100. *Id.* art. 12.

101. *Id.* art. 14.

102. *See id.* art. 11-12, 14.

103. *See id.*

104. *See id.* art. 15.

105. *See id.* art. 16.

106. *See id.* art. 5-6; *see generally* WEISS, *supra* note 19, at 246-47.

the “equitable and reasonable use,” development, and protection of watercourses by watercourse states. Under this article, watercourse states shall use and develop watercourses “with a view to attaining optimal and sustainable utilization . . . consistent with adequate protection of the watercourse.”¹⁰⁷ Article 6 assists in determining what constitutes “equitable and reasonable use” by listing relevant factors to be balanced in making the decision.¹⁰⁸ Article 6 also provides some guidelines for the weighing of each factor, but the guidelines are not clear-cut.¹⁰⁹ Thus, the balancing is fact-specific and can change from scenario to scenario.¹¹⁰

There has been much discussion and analysis over the terms “equitable” and “reasonable” as the U.N. Watercourses Convention does not provide clear definitions of either term.¹¹¹ The U.N. Watercourses Convention has, however, provided some guidance in understanding the terms. With regard to “equitable,” it is the position of the U.N. Watercourses Convention that “every riparian state has a right to the utilisation of the watercourse which is qualitatively equal to the rights of the co-riparians.”¹¹² It adds that this does not necessarily mean that each state is entitled to equal quantities.¹¹³ It advises that “the concept demands the weighing and balancing of the competing (reasonable) interests of states, taking into account all relevant factors and circumstances” of Article 6.¹¹⁴ With regard to “reasonable,” the U.N. Watercourses Convention offers that while “equitable” is used in balancing various uses between states, in case of a conflict of use, “reasonable” is applied when judging the quality of the use.¹¹⁵

Articles 5 and 6 do not prevent the establishment of water markets; they do, however, limit the situations in which water markets may be used to those situations where the benefits outweigh adverse effects.¹¹⁶ For example, in the non-riparian–riparian water market, it is possible to include the research and development resulting from the sale of water rights to the non-riparian state as a consideration under the Article 6(f) factor of “[c]onservation, protection, development, and economy use of the water resources of the watercourse and the costs of measures taken to that effect.”¹¹⁷ This would support the sale of water rights on

107. *See id.* art. 5; *see generally* WEISS, *supra* note 19, at 246-47.

108. *See id.* art. 6; *see generally* WEISS, *supra* note 19, at 246-47.

109. *See id.* art. 6; WEISS, *supra* note 19, at 246-47.

110. *See generally* WEISS, *supra* note 19, at 246-47.

111. *See generally id.*

112. U.N. WATERCOURSES CONVENTION—ONLINE USER’S GUIDE, *Article 5, 5.1.2 What is Meant by ‘Equitable’?*, U.N. WATERCOURSES CONVENTION ONLINE USER’S GUIDE (Apr. 26, 2014), <http://www.unwatercoursesconvention.org/the-convention/part-ii-general-principles/article-5-equitable-and-reasonable-utilisation-and-participation/5-1-2-what-is-meant-by-equitable/>.

113. *See id.*

114. *Id.*

115. *See* U.N. WATERCOURSES CONVENTION—ONLINE USER’S GUIDE, *supra* note 114.

116. *See* U.N. Convention, *supra* note 51, art. 5-6.

117. *See id.* art. 6; *see generally* WEISS, *supra* note 19, at 246-47.

the water market. Other factors such as “social and economic needs” and “the population dependent on the watercourse” would not be implicated because, in the above scenarios, the riparian state would not be depriving itself and its own population from its water supplies in order to sell to the non-riparian state.

However, one factor that may cause the marketing of water rights to conflict with the Convention is Article 6(d): “The effects of the use or uses of the watercourses in one watercourse State on other watercourse States.”¹¹⁸ In order for the marketing of water to be permitted under the Convention in the above scenarios, there would have to be no negative effects on downstream riparian states, or the effects would have to be outweighed by the benefits.¹¹⁹ The latter would be possible in a non-riparian–riparian water market, for example, if the amount of water promised to a contracting state does not exceed the surplus generated from the use of technology it funded, and if it does not cause a decrease in the downstream flow.

3. Obligation Not to Cause Significant Harm: Article 7

Article 7 entails an “[o]bligation not to cause significant harm,” requiring watercourse states to “take all appropriate measures to prevent the causing of significant harm to other watercourse States.”¹²⁰ Again, the article is only implicated in water markets if the transaction would cause some type of “significant harm” to a downstream riparian state.¹²¹ The article does not completely disallow any transaction that may have *some* negative effect to downstream riparian states, only those that cause *significant harm*.¹²² Transactions that may have some negative effects are accounted for under Articles 5 and 6.¹²³ In fact, the transactions described above may have positive effects for the downstream riparians because the water-efficient technology developed from the non-riparian’s funding could cause more and/or cleaner water to flow downstream.

In addition, even if significant harm is caused to another watercourse state, Article 7(2) provides that “in the absence of agreement to such use,” the state whose use caused such harm shall try to mitigate such harm or discuss compensation.¹²⁴ Thus, in order to avoid implicating this Article, states engaging in transactions in the water market should seek separate agreements with any states

118. *See id.* art. 6.

119. *See id.* art. 6; *see generally* WEISS, *supra* note 19, at 246–47.

120. U.N. CONVENTION, *supra* note 51, art. 7, ¶ 1.

121. *See id.* art. 7.

122. *See id.* art. 7.

123. *See id.* art. 5–6.

124. *Id.* art. 7, ¶ 2.

that may be harmed by the use, such as downstream riparian states.¹²⁵ One way to convince a downstream riparian state to enter into an agreement is to give it some fruits of the transaction as well.¹²⁶ In the case of selling electricity generated from the water use, the state causing the harm could agree to give lower riparian states some of the electricity generated.

This article also brings into question who would be considered the state “using” water: Would it be the state selling the water or the state receiving the water and, in some situations, literally using the water? It should be the state selling the water, regardless of whether or not the state buying the water is literally using the water. The state selling the water has the original rights to the water and were it not for its decision to “use” the water first by selling it, the purchasing state would not have access to the water. Even when the purchasing state is literally using the water, the water is actually in “use” by the initial state because that state sold it. The water-marketing state should bear responsibility for the potential harms of water market transactions.

4. Vital Human Needs: Article 10

Article 10 sets guidelines for determining the “[r]elationship between different kinds of uses” to prioritize uses of an international watercourse.¹²⁷ Article 10 provides that while no use is inherently more important than others, “[i]n the event of a conflict between uses of an international watercourse, it shall be resolved with reference to Articles 5 to 7, with special regard being given to the requirements of vital human needs.”¹²⁸

The effect of this article on all three different water markets is the same: even if the transaction survives Articles 5 to 7, Article 10 suggests that vital human needs must be taken into account and provides that it takes priority over Articles 5 to 7. However, even with the conditions of this article, water markets can still function. Article 10 simply places a restriction—that there cannot be any infringement on vital human needs. Thus, this article adds an additional requirement to the transaction: if the terms may cause *significant harm*, liability may be contracted away, but if the significant harm is to vital human needs, the transaction may conflict with the U.N. Watercourses Convention under Article 10.

The potential limitation posed by “vital human needs” invites the question: What constitutes vital human needs? The United Nations currently defines vital human needs as “sufficient water to sustain human life, including both drinking water and water required for the production of food in order to prevent

125. *See id.* art. 7.

126. *See generally* WEISS, *supra* note 19, at 58-61, 189, 245.

127. U.N. CONVENTION, *supra* note 51, art. 10.

128. *Id.* art. 10, ¶ 2.

starvation.”¹²⁹ This is a much narrower approach than the 2002 General Comment on the Right to Water attached to the U.N. International Covenant on Economic, Social, and Cultural Rights, which used the term “personal and domestic uses” and included in it uses such as washing clothes and personal hygiene.¹³⁰ This relatively narrow approach to the definition decreases the likelihood that the provision will be implicated in future assessments of the priority of different water uses. In addition, the United Nations offers a possible scenario in which vital human needs may not take priority: where the needs could be satisfied by an alternative supply of water.¹³¹ For now, the U.N. Watercourses Convention approaches vital human needs with a narrow focus. Furthermore, just because vital human needs may be implicated does not necessarily preclude the water use or planned measure.¹³² Because the definition of “vital human needs” with respect to the U.N. Watercourses Convention is narrow, it is conducive to the establishment of water markets because it reduces the possibility of vital human needs being implicated. Thus, giving special regard to vital human needs does not necessarily preclude the formation of private contracts in the development of water markets.

CONCLUSION AND THOUGHTS FOR THE FUTURE

Is the U.N. Watercourses Convention conducive to the successful establishment and functioning of water markets? Do the principles under which the U.N. Watercourses Convention was established conflict with the use of water markets in the management of water resources? Although the U.N. Watercourses Convention was written in anticipation of rights changing as balancing factors change, which seems inconsistent with the well-defined rights essential to water markets, its principles allow for the existence of water markets. The principles set parameters within which water markets may function, namely, that negative effects to third-party riparian states must be outweighed by benefits such as water use efficiency and environmental protection. However, for potentially significant harms, agreements may be made to avoid mitigating duty or liability, unless the significant harm affects vital human needs.

Ultimately there are two aspects of the U.N. Convention that have the potential to conflict with and limit the use of water markets in the future, though they do not currently impose strong limitations on the development of water markets: the implication of vital human needs and the potentially inconsistent determinations

129. See U.N. WATERCOURSES CONVENTION—ONLINE USER’S GUIDE, *supra* note 65.

130. See *id.*

131. U.N. WATERCOURSES CONVENTION—ONLINE USER’S GUIDE, *supra* note 65 (“Pursuant to the need to account for ‘the availability of alternative’ under Article 6 of the UN [sic] Watercourses Convention, a scenario may therefore exist where a state could satisfy vital human needs from a domestic water source, if it was in close proximity to the international watercourse in question.”).

132. See *id.*

of water rights through the flexible “equitable and reasonable use” balancing. With regards to the equitable and reasonable use limitation on water markets, the U.N. Watercourses Convention *allows* for fluidity in the determination of water rights, and it is also able to provide the market with well-defined water rights to ameliorate the looming water scarcity problem facing our world. The continuing importance of the U.N. Watercourses Convention means that it will play a major role in any attempts to implement water markets in the ongoing struggle to develop innovative water management methods and support a growing world population.