The American Southeast and South Sudan: The Emergence of Environmental Factors in Transboundary Water Law

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"A river is more than an amenity, it is a treasure. It offers a necessity of life that must be rationed among those who have power over it."¹

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 $^{^1\,}$ New Jersey v. New York, 283 U.S. 336, 342 (1931) (Holmes, J., writing for majority).

I. Introduction

The recent independence of the Republic of South Sudan (South Sudan) on July 9, 2011² is cause for celebration, but, with this newly found independence, the young nation also faces many challenges.³ One of the challenges it must confront is the future of the Jonglei canal, a project slated to channel the White Nile in South Sudan. If completed, the Jonglei Canal would devastate, if not completely obliterate, the Sudd wetlands,⁴ also located in South Sudan. Due to the global ecological importance of the Sudd wetlands,⁵ if South Sudan chooses to construct the Jonglei Canal, interested parties outside of South Sudan are likely to seek an equitable apportionment⁶ of the use of the Nile through international litigation brought before the International Court of Justice (ICJ).⁷

This comment advocates that, in resolving future transboundary water conflicts, courts should place greater weight

⁵ See Peter Martell, South Sudan's Wild Hope for the Future, DAILY STAR, July 13, 2011, http://www.dailystar.com.lb/Culture/Lifestyle/2011/Jul-13/South-Sudans-wild-hope-for-the-future.ashx#axz1d3fmH992.

⁶ The equitable apportionment doctrine is a relatively new method of resolving interstate water disputes. Colorado v. New Mexico, 459 U.S. 176, 186 (1982). A court resolves an interstate water dispute through equitable apportionment when one user wishes for the existing water use to be allocated in a more fair or equitable manner. *Id.* at 187-88. In a two-pronged approach, the user bringing suit must first show that without the court's equitable apportionment, the user will suffer "real or substantial injury or damage," *id.* at 187 n.13 (citing Connecticut v. Massachusetts, 282 U.S. 660, 672 (1931)), through "clear and convincing evidence." *Id.* at 187. Once that first prong is met, the court then considers a variety of factors in determining the most equitable allocation of water use among the users. Some factors the court considers are the following: the benefits and detriments to the upstream and downstream users, the types of established uses, and the existing water conservation techniques available. *See* Nebraska v. Wyoming, 325 U.S. 589, 618 (1945).

⁷ For purposes of this comment, it will be assumed that some downstream riparian countries bordering the Nile River will object to the Jonglei canal and bring suit, even though history and current events may suggest otherwise.

² See Jeffrey Gettleman, Struggle Over, Independent South Sudan Rejoices, N.Y. TIMES, July 10, 2011, at A6.

³ See Emma Ross, Southern Sudan Has Unique Combination of Worst Diseases in the World, SUDAN TRIB., Jan. 27, 2004, http://www.sudantribune.com/Southern-Sudan-has-unique,1616.

⁴ For purposes of this comment, the term "Sudd wetlands" will refer to both the permanent wetlands and the seasonal floodplains.

on ecological factors when applying the equitable apportionment doctrine. Specifically, in following the trajectory set by the American courts and the ICJ itself, the ICJ should place greater weight on ecological factors in its equitable apportionment analysis when resolving a future transboundary water conflict regarding the Jonglei Canal.

Domestically, equitable apportionment is used sparingly by the United States Supreme Court.⁸ A current conflict in the American Southeast, however, presents an opportunity for the Court to formally update the doctrine to reflect the growing importance that environmental factors play in the health and ecology of states and countries.⁹ Alabama, Florida, and Georgia are still in a twentyyear dispute over water allocation of the Apalachicola, Chattahoochee, and Flint (ACF) Rivers.¹⁰ Despite the three states' many attempts at resolution, the ACF dispute has not been satisfactorily resolved in mediation,¹¹ or in the lower federal courts.¹² Scholars suggest that a final resolution is possible only under the United States Supreme Court's jurisdiction to equitably apportion interstate water use.¹³ If granted certiorari by the Supreme Court, this case would also provide an opportunity for the Court to update the equitable apportionment doctrine to give more weight to ecological factors.

In influencing an outcome in the domestic ACF water dispute

⁸ See Arizona v. California, 373 U.S. 546, 565 (1983) ("[C]ourts have no power to substitute their own notions of an 'equitable apportionment' for the apportionment chosen by Congress.").

⁹ See generally J.B. Ruhl, Equitable Apportionment of Ecosystem Services: New Water Law for a New Water Age, 19 J. LAND USE & ENVTL. L. 47, 52-53 (2003).

¹⁰ See C. Grady Moore, Water Wars: Interstate Water Allocation in the Southeast, 14 NAT. RESOURCES & ENV'T 5 (1999) (explaining the history of the dispute).

¹¹ The ACF River Compact was a six-year agreement (1997-2003) to stall litigation for the purpose of working towards a compromised water allocation solution. *See* Ruhl, *supra* note 9, at 50.

¹² Following the expiration of the Compact on August 31, 2003, litigation in the lower federal courts reopened. *See* Alyssa S. Lathrop, comment, *A Tale of Three States: Equitable Apportionment of the Apalachicola-Chattahoochee-Flint River Basin*, 36 FLA. ST. U. L. REV. 865, 871-72 (2009).

¹³ Though Congress has the authority to "legislative[ly] apportion" water use under its implied authority pursuant to the Commerce Clause, it is unlikely to do so due to the highly politicized atmosphere surrounding this controversy. Dustin S. Stephenson, *The Tri-State Compact: Falling Waters and Fading Opportunities*, 16 J. LAND USE & ENVTL. L. 83, 93-94 (2000).

case, the Supreme Court's possible integration of ecological factors in the equitable apportionment doctrine would have global ramifications as well. The United Nations (UN) Convention on the Law of Non-Navigational Uses of International Watercourses (UN Watercourse Convention) was modeled after the United States' equitable apportionment doctrine.¹⁴ The UN Watercourse Convention guides the ICJ's resolution of water disputes between countries.¹⁵ Just as the ACF dispute highlights the possibility of integrating ecosystem services into the American equitable apportionment doctrine, the potential Jonglei Canal dispute along the Nile River may also provide a parallel opportunity in the international courts.¹⁶

Though projected to increase the White Nile's water output by 100%,¹⁷ the Jonglei Canal may also have devastating consequences on the Sudd wetlands. Interests that depend on the Sudd wetlands for their economic and environmental health may seek legal redress by petitioning the ICJ, which is guided by the UN Watercourse Convention, for an equitable apportionment of the Nile. As stated earlier, this comment argues that both the United States Supreme Court and the ICJ should use their respective disputes (the ACF dispute and the Jonglei Canal dispute) as opportunities to revise and emphasize the importance

¹⁴ See A. Dan Tarlock, Safeguarding International River Ecosystems in Times of Scarcity, 3 U. DENV. WATER L. REV. 231, 237 (2000).

¹⁵ The judgments of the International Court of Justice are binding on U.N. Member States that have submitted themselves to the ICJ's jurisdiction. How the Court Court OF Works. INTERNATIONAL JUSTICE, http://www.icj-cij.org/ court/index.php?p1=1&p2=6 (last visited Oct. 9, 2012). A State may accept the ICJ's jurisdiction in one of three ways: "by entering into a special agreement to submit the dispute to the Court; by Virtue of a jurisdictional clause ... [or] through the reciprocal effect of declarations made by them under the Statute whereby each has accepted the jurisdiction of the Court as compulsory in the event of a dispute with another State having made a similar declaration." Id. Thus, it follows that the parties to the Jonglei Canal litigation, themselves UN Member States, must agree to submit themselves to an ICJ judgment. Member States of the United Nations, UNITED NATIONS, http://www.un.org/en/members/#s (last visited Oct. 9, 2012).

¹⁶ See infra Part IV.

¹⁷ See Erwin Lamberts, *The Effects of Jonglei Canal Operation Scenarios on the Sudd Swamps in Southern Sudan* 4 (Aug. 2009) (unpublished master thesis, Twente University), *available at* http://essay.utwente.nl/59163/1/scriptie_E_Lamberts.pdf ("More than 50% of the Sudd inflow is evaporated out of the Sudd swamps, resulting in less water availability in the downstream areas.").

of ecological factors in the equitable apportionment doctrine.¹⁸ An ecosystem-based equitable apportionment approach of the Nile would result in the development of the canal and the maintenance of the Sudd wetlands at a level that ensures a healthy and functioning ecosystem.

Part II describes the two precursors to the equitable apportionment doctrine, the traditional equitable apportionment doctrine, and an innovative equitable apportionment approach taken by the United States Supreme Court in Idaho v. Oregon. Part III describes the current ACF litigation, how it highlights the potential to integrate ecosystem services in the equitable apportionment analysis, why ecosystem services should be emphasized, and what that equitable apportionment might look like. Part IV describes the ICJ's parallel trajectory towards integrating ecological factors in its own international equitable apportionment analysis. Part V gives a brief background to the Jonglei Canal controversy. Part VI applies three methods of equitable apportionment towards future litigation of the Jonglei canal – the traditional equitable apportionment analysis, the Idaho Oregon standard, and the ecosystem-focused equitable v. apportionment approach.

II. Equitable Apportionment and its Precursors

This section describes the precursors to the equitable apportionment doctrine by briefly summarizing the prior appropriation doctrine and the reasonable use doctrine. The traditional equitable apportionment doctrine and the United States Supreme Court's unique equitable apportionment approach taken in *Idaho v. Oregon* will also be discussed.

A. Prior Appropriation

Prior appropriation developed in states "west of the Mississippi River"¹⁹ and was triggered when the following three requirements were met: "an intent to divert water for a beneficial use, an actual diversion of water, and application of the water to the beneficial use intended."²⁰ Nicknamed "first in time, first in

¹⁸ See Ruhl, supra note 9, at 52.

¹⁹ Stephenson, *supra* note 13, at 89.

²⁰ Id. (emphases omitted).

right,"²¹ the prior appropriation doctrine resolved conflicts in favor of the user that first triggered prior appropriation.²² Earlier appropriators had their water needs fulfilled before any later appropriators.²³ In order to maintain the right to use the water as a prior appropriator, the user "must 'use it or lose it,' as the right to the water continues only so long as the beneficial use is maintained."²⁴ Though simple in application, this system directly conflicts with conservation measures and developments:

The risk of losing a water right creates a strong disincentive against using it for an unsanctioned purpose or simply reducing its use [W]ater right holders will continue to use water at historical rates and through historical means, for fear of losing any unused portion of the right. Water use efficiency can reduce input costs ... but the right holder must balance these benefits with the potentially lost value of the water right itself.²⁵

B. Reasonable Use

The doctrine of reasonable use is a separate, and perhaps more lenient,²⁶ system of allocating water usage that developed in the eastern United States.²⁷ A riparian owner, the landowner whose property borders the river in question,²⁸ may "make any reasonable use of the water flowing through a watercourse adjacent to land the riparian owns, so long as that use does not adversely affect the rights of other riparian owners along the watercourse."²⁹ Like the doctrine of prior apportionment, the reasonable use doctrine creates uncertain riparian rights³⁰ and is ill-equipped to resolve modern issues. For example, when water is

- ²⁴ Stephenson, *supra* note 13, at 89-90.
- ²⁵ Schempp, *supra* note 23, at 10395-96.
- ²⁶ Stephenson, *supra* note 13, at 90.
- ²⁷ Id.
- ²⁸ BLACK'S LAW DICTIONARY 1441-42 (9th ed. 2009).
- ²⁹ Stephenson, *supra* note 13, at 91 (emphasis omitted).
- ³⁰ See id.

²¹ DAVID H. GETCHES, WATER LAW IN A NUTSHELL 5 (2d ed. 1990).

²² See Stephenson, *supra* note 13, at 90 ("[W]hoever first acquires the right to use the water acquires the most senior claim, with all other claims falling junior to the first, in chronological order of attachment.").

²³ Adam Schempp, Western Water in the 21st Century: Policies and Programs that Stretch Supplies in a Prior Appropriation World, 40 ENVTL. L. REP. NEWS & ANALYSIS 10394, 10395 (2010).

abundant, the reasonable use doctrine fares well because all water uses are allowed "so long as that use does not adversely affect the rights of other riparian owners along the watercourse."³¹ In times of drought or lower water levels, however, "uses that [were] reasonable in normal years may appear excessive"³² Thus, this changing standard encourages uncertainty and litigation.³³

C. Traditional Equitable Apportionment

Recognizing the shortcomings in both the prior appropriation and reasonable use doctrines,³⁴ the United States Supreme Court in Kansas v. Colorado³⁵ first recognized and applied the equitable apportionment doctrine in resolving interstate water disputes. In a slightly confusing nomenclature, the equitable apportionment doctrine is comprised of two steps: demonstration of a real substantial injury and equitable apportionment of resources. To demonstrate a real and substantial injury, the State seeking an equitable apportionment must show "by clear and convincing evidence some real and substantial injury or damage."³⁶ The Supreme Court has historically considered ecological or environmental injuries correlating to economic injuries to be sufficient in fulfilling this requirement.³⁷ In other words, under the traditional equitable apportionment doctrine, injury to ecological considerations alone would not be sufficient to find a substantial injury.³⁸

The second step—equitable apportionment—is the equitable allocation of water on a watercourse. Equitable apportionment seeks to "ameliorat[e] present harm and prevent[] future injuries to the complaining State "³⁹ It allows for flexibility in creating

³⁶ Colorado v. New Mexico, 459 U.S. 176, 187 n.13 (1982) (citing Connecticut v. Massachusetts, 282 U.S. 660, 672 (1931)). For purposes of this comment, this prong is referred to as the substantial injury step.

³⁷ See, e.g., New Jersey v. New York, 283 U.S. 336, 344 (1931) (finding that injuries to the shad fisheries and oyster industry were sufficient to pass the "clear and substantial evidence" test).

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 $^{^{31}}$ Id.

³² Moore, *supra* note 10, at 6.

³³ See Stephenson, supra note 13, at 91.

³⁴ See id.; Moore, supra note 10, at 6.

³⁵ Kansas v. Colorado, 206 U.S. 46 (1907).

³⁸ See Ruhl, supra note 9, at 54.

³⁹ Idaho *ex rel*. Evans v. Oregon, 462 U.S. 1017, 1028 (1983).

an equitable allocation through its consideration of a variety of factors.⁴⁰ Some of those factors are: "physical and climatic conditions, . . . the extent of established uses, . . . the practical effect of wasteful uses on downstream areas, [and] the damage to upstream areas as compared to the benefits to downstream areas."⁴¹

Surprisingly, even under traditional equitable the apportionment doctrine, the broad language of the second prong allows the court to consider non-economic factors, like ecosystem services, in allocating the equitable apportionment. For example, in New Jersey v. New York,⁴² the Supreme Court "ruled that New York must provide the downstream Delaware Basin states with sufficient minimum base flow . . . to dilute New York City's waste discharges."43 The remedy under this traditional equitable apportionment was a minimum-flow regime sufficient to remove the injury from the other party.⁴⁴ This decision, however, was still motivated by a desire to protect New Jersey's economy. The Court recognized that, should New Jersey's oyster industry suffer, its economy would suffer as well.⁴⁵ Using this information, the Court equitably apportioned the water use to prevent a salinity increase, thereby sustaining New Jersey's oyster industry.⁴⁶

D. Idaho v. Oregon

More recently, the Court has recognized that a species itself can be the resource undergoing equitable apportionment. In *Idaho ex rel. Evans v. Oregon*,⁴⁷ the Court found that:

[A]lthough [the equitable apportionment] doctrine has its roots in water rights litigation . . . the natural resource of anadromous fish is sufficiently similar to make equitable apportionment an appropriate mechanism for resolving allocative disputes Much as in a water dispute, a State that overfishes a run

- ⁴³ Ruhl, *supra* note 9, at 54-55.
- ⁴⁴ See New Jersey, 283 U.S. at 345.
- ⁴⁵ Id.
- ⁴⁶ *Id.* at 345-46.
- ⁴⁷ Idaho *ex rel*. Evans v. Oregon, 462 U.S. 1017 (1983).

 $^{^{40}\,}$ See Colorado, 459 U.S. at 183-84 (quoting Nebraska v. Wyoming, 325 U.S. 589, 618 (1945)).

⁴¹ *Nebraska*, 325 U.S. at 618.

⁴² See New Jersey, 283 U.S. 336.

downstream deprives an upstream State of the fish it would otherwise receive.⁴⁸

In *Idaho*, the State of Idaho brought suit against Oregon and Washington, claiming that the fishing industries from both states had harvested more than their equitable share of fish originating in Idaho's waters.⁴⁹ Here, the Court rejected Idaho's assumption that its right to the fish came from their place of origination.⁵⁰ Rather, the Court stated, "Idaho has no legal right to the anadromous fish hatched in its waters."⁵¹ Additionally, the Court clarified that the right is to the *use* of the resource rather than to the ownership of it.⁵²

Before conducting an equitable apportionment of the fish, the Court declared that the fish itself is the resource to be equitably apportioned.⁵³ Thus, it follows that any injury to that resource would be sufficient to meet the "real and substantial injury" prong. In this case, in order for Idaho to meet the "real and substantial injury" prong, it needed to show that its normal harvest was disproportionately reduced and that those reductions were "caused by mismanagement or overfishing by Washington and Oregon."⁵⁴

The *Idaho* Court further distinguished the first prong by requiring that the alleged injury be "based on present conditions."⁵⁵ For example, when Idaho filed suit against Oregon and Washington for an equitable apportionment of the fish, Idaho simultaneously ran three large dams that prevented the use of spawning areas, killing large numbers of adult fish.⁵⁶ In considering whether an injury was demonstrated, the Court

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⁴⁸ *Id.* at 1023.

⁴⁹ The Court found that because "Idaho cannot claim legal ownership of the fish," where the fish originated does not factor into an equitable apportionment equation. *Id.* at 1028 n.12. Also, the *Idaho* Court stated that "existing legal entitlements," such as those resulting from the application of previous water apportionment doctrines, "are important factors in formulating an equitable decree, [but that] such legal rights must give way in some circumstances to broader equitable considerations." *Id.* at 1025.

⁵⁰ See id.

 $^{^{51}}$ *Id.* The idea that a resources origination is not vital may have important implications in a future Jonglei Canal dispute.

⁵² See id. at 1030; See Stephenson, supra note 13, at 89.

⁵³ *Idaho*, 462 U.S. at 1025.

⁵⁴ See id. at 1028-29.

⁵⁵ *Id.* at 1027.

⁵⁶ See id. at 1020-21.

recognized that the dams were likely to continue operating and likely to continue decreasing the fish population.⁵⁷ This condition, then, must be accepted by all three states and would not be a factor in Idaho's "existence of a cognizable injury."⁵⁸ Consequently, Idaho must show that a "real and substantial injury" was caused by Oregon and Washington's alleged overfishing or mismanagement of their fishing industry based on the already depressed fishing population from the existing dams.⁵⁹

Because Idaho was not successful in proceeding beyond the first step, it is unknown how the Court would equitably apportion the fish. However, because the Court took the unique and unprecedented step in declaring that fish is a resource to be equitably apportioned, the Court likely would have equitably apportioned the resource in a generous manner.

III. ACF Litigation & Ecosystem Services Equitable Apportionment

This section describes the current Apalachicola– Chattahoochee–Flint (ACF) litigation, how this controversy provides an opportunity for the Supreme Court to integrate ecological factors in the equitable apportionment analysis, and what an equitable apportionment analysis might look like as applied to the ACF dispute.

The traditional equitable apportionment analysis, described in Part I.C, allows environmental injuries to be included where they correlate with economic injuries.⁶⁰ This traditional view, however, does not adequately capture the true value of ecological factors such as ecosystem services.⁶¹ In the ACF water dispute, the insufficiency of a traditionally equitably apportioned result highlights the inadequacy of the doctrine.⁶² The ACF dispute

⁵⁷ *Id.* at 1027.

⁵⁸ *Idaho*, 462 U.S. at 1028 n.11.

⁵⁹ *Id.* at 1027.

⁶⁰ See New Jersey v. New York, 283 U.S. 336, 344 (1931).

⁶¹ For purposes of this comment, the terms ecological factors and ecosystem services are used interchangeably.

⁶² See Fuchsia, Editorial, Water Wars Our Position: Florida Shouldn't Give Up Water to Fuel Growth in Georgia or Here, ORLANDO SENTINEL, Sept. 3, 2003, at A8 ("That approach does not begin to provide for the historic ebb and flow of water levels in the Apalachicola Bay ecosystem.").

provides a ripe opportunity for the Court to update its equitable apportionment doctrine to more accurately capture the value and importance of ecological factors.⁶³

The ACF river system is made up of three rivers: the Chattahoochee, the Flint, and the Apalachicola rivers.⁶⁴ The Chattahoochee and Flint Rivers originate in northern Georgia.⁶⁵ Both meander southward until they merge at the Florida border, entering Florida as the Apalachicola River.⁶⁶ The Chattahoochee River supplies Atlanta's drinking water through Lake Lanier, a lake created by the Buford Dam.⁶⁷ While the Chattahoochee provides drinking water to Georgia's urban areas, the Flint River is a source of irrigation for Georgia's rural areas.⁶⁸ The Flint River also has "historically provided more than forty percent of the [Apalachicola] Basin's summer flow."⁶⁹ Farther south, the Apalachicola River is Florida's largest river and, of the American southeast, the fourth largest.⁷⁰ Furthermore, it "discharges sixteen billion gallons of nutrient-rich freshwater daily into the Apalachicola Bay, an immensely productive estuary... which brings in more than \$130 million per year in revenue."⁷¹ Unfortunately, the health of the Apalachicola Basin depends on the continual flow of water to dilute the contaminants flowing from Alabama and Georgia, and to provide water for Florida's rich Therefore, because of Alabama's and Florida's estuaries.⁷² interest in the ACF river system, Georgia's desire to increase water use for its industrial and municipal sectors has been the source of contention for over twenty years.⁷³ If the ACF case is

⁶⁸ *Id.* at 868.

- ⁷⁰ Id.
- ⁷¹ *Id.* at 868-69.

⁷² See Jeffrey Uhlman Beaverstock, Comment, Learning to Get Along: Alabama, Georgia, Florida and the Chattahoochee River Compact, 49 ALA. L. REV. 993, 996-97 (1998).

⁷³ Douglas L. Grant, Interstate Allocation of Rivers Before the United States Supreme Court: The Apalachicola-Chattahoochee-Flint River System, 21 GA. ST. U. L. REV. 401, 401-02 (2004).

⁶³ See Ruhl, supra note 9, at 52.

⁶⁴ *Id.* at 48.

⁶⁵ See Stephenson, supra note 13, at 84.

⁶⁶ See id.

⁶⁷ Lathrop, *supra* note 12, at 867-68.

⁶⁹ Id.

heard in the United States Supreme Court, it may provide an opportunity for the Court to update the equitable apportionment doctrine to better reflect the value of ecological factors.⁷⁴

⁷⁴ Ruhl, *supra* note 9, at 52. The United States Supreme Court has not equitably apportioned interstate water use since "the age of mature environmental statutory law." *Id.* at 49.



Figure 1: The Appalachicola, Tallahassee, and Flint River System⁷⁵

Ecosystem services can be defined as the "ecosystem goods (such as food) and services (such as waste assimilation)" derived from the "habitat, biological or system properties or processes of ecosystems."⁷⁶ Some examples of the ecosystem services that wetlands provide are the following: flood control, food for estuarine species, erosion control, mitigation of environmental

⁷⁵ Helen M. Light, Melanie R. Darst & J.W. Grubbs, Aquatic Habitats in Relation to River Flow in Apalachicola River Floodplain, Florida 4 (1998).

⁷⁶ Robert Costanza et al., *The Value of the World's Ecosystem Services and Natural Capital*, 387 NATURE 253, 253 (1997).

fluctuations, and others.⁷⁷ Because plant and animal species play a role in ensuring ecosystems are healthy enough to provide those services, inherent in the ecosystem services definition are issues affecting the health and populations of animal and plant species.⁷⁸ Recognizing the benefits of ecosystem services also reflects a growing awareness that these benefits are not easily translated into economic terms.⁷⁹ Therefore, in order for an equitable apportionment to accurately reflect the true value of ecosystem services, injuries to ecosystem services should be considered in the first step of the equitable apportionment analysis and given more weight in the second step.⁸⁰

Though neither Florida nor Alabama has pleaded injury to ecosystem services in its brief, scholars suggest that Florida should advocate for an equitable apportionment that "mimic[s] historic water fluctuations downstream."⁸¹ Specifically, in bringing a suit for the equitable apportionment of water use, Florida could present an "interest . . . in maintaining [the] ecological quality downstream of water-hungry Georgia and into Apalachicola Bay."⁸² If ecosystem services are recognized in the first step,⁸³ then any injury to the ecological quality of the Apalachicola Bay would meet the "clear and substantial injury" requirement.

If ecosystem services are recognized as a cognizable injury under the first step,⁸⁴ a dissonance in the doctrine would occur unless ecosystem services are given proportionally greater weight in the second step. For example, in *New Jersey v. New York*, even though the Court did recognize ecosystem services in their allocation, its decision in deriving a minimum base flow was actually a compromise of two competing uses: the beneficial

- ⁸² Ruhl, *supra* note 9, at 48.
- ⁸³ See id. at 54.
- ⁸⁴ Id.

⁷⁷ Id. at 253-54.

⁷⁸ Id.

⁷⁹ Id.

⁸⁰ See Ruhl, supra note 9, at 54. Comparatively, in response to a takings claim under the Endangered Species Act, the Middle District of Florida recently held that "the role 'natural' flows play in the species' survival . . . is not injury or causation for the purposes of standing." *In re* Tri-State Water Rights Litigation, No. 3:07-md-01 (PAM/JRK) 2010 U.S. Dist. Lexis 108931 (M.D. Fla. July 21, 2010) (memorandum and order denying and dismissing cross motions for summary judgment).

⁸¹ Fuchsia, *supra* note 62, at A8.

economic impacts in allowing New York to divert the upstream water use and a recognition that New Jersey's oyster industry needed low salinity levels to survive.⁸⁵ Thus, even though ecological factors were considered, the factors were not given their due weight, which resulted in a court-apportioned minimum-flow regime.⁸⁶

Under a more ecologically focused approach, equitable apportionment of water use would create an "ecologically-based flow regime at the mouth of the Apalachicola River."⁸⁷ Such a result could fluctuate between one of two flow regimes: a purely natural-flow regime or a compromise between the natural-flow and minimum-flow regimes.⁸⁸ Thus, the ACF dispute is an ideal opportunity for the Court to confirm the importance ecosystem factors plays in the ecological and economic health of states.

IV. Jonglei Canal

The projected construction of the Jonglei Canal along the Nile River presents an analogous international example to the ACF because, like the ACF river system, which transects and borders three states, the Nile River also transects and borders multiple countries. Both river systems also include wetlands, deltas, and citizens that will be directly affected by equitable apportionment. In setting up this international equitable apportionment case study, this section provides the background materials for the Nile region, the Jonglei Canal, and the UN Watercourse Convention.

A. The Nile River

This section briefly describes the Sudd wetlands and their ecological importance, and describes how the Jonglei Canal may drastically change the ecology of the Nile region and the political relationships among Nile-bordering countries.

The Nile River is a combination of two tributaries originating in two different locations. The Blue Nile begins in the highlands

⁸⁵ See New Jersey v. New York, 283 U.S. 336, 345-46 (1931).

⁸⁶ See Ruhl, supra note 9, at 54-55.

⁸⁷ *Id.* at 48.

⁸⁸ Because the minimum-flow regime is the apportionment of water use necessary to remove the injury, it follows that the minimum-flow regime is the typical result following application of the traditional equitable apportionment. *New Jersey*, 283 U.S. at 345.

of Ethiopia and the White Nile begins in Lake Victoria near Uganda.⁸⁹ The White Nile originates in Lake Victoria and the mountains surrounding Rwanda and Burundi,⁹⁰ then diverges in South Sudan to create the Bahr al-Jabal and Bahraz-Zaraf Rivers.⁹¹ When flooded, the Bahr al-Jabal and Bahraz-Zaraf Rivers "flood the adjacent low ... flat plains ... creating a vast marshland."⁹² The White Nile feeds the resulting Sudd wetlands,⁹³ giving South Sudan and the Republic of Sudan its name. The Blue Nile begins farther northeast in Ethiopia.⁹⁴ It meanders southwest then north to join the White Nile at Khartoum, the capital of the Republic of Sudan.⁹⁵ Once there, the White and Blue Nile join to form the Nile River.⁹⁶ The Nile then flows northward through Egypt into the Nile Delta on the Mediterranean Sea.⁹⁷ Because of the White Nile's seasonal flooding and resulting evapotranspiration, tributaries originating in the highlands of Ethiopia-including the Blue Nile—supply around eighty-five percent of the Nile River's water.98

The Sudd wetlands are comprised of permanent wetlands and seasonal floodplains that fluctuate with the Nile River's seasonal flooding.⁹⁹ The Sudd wetlands cover an area greater than 30,000 square kilometers,¹⁰⁰ making it Africa's largest wetlands¹⁰¹ and

⁹² Adil Mustafa Ahmad, Post-Jonglei Planning in Southern Sudan: Combining Environment with Development, 20 ENV'T & URB. 575, 576 (2008).

⁹³ See Brunnee & Toope, supra note 89, at 117.

⁹⁴ See Ahmad, supra note 92, at 580.

⁹⁵ See Brunnee & Toope, supra note 89, at 117.

⁹⁶ Id.

⁹⁷ *Id.*; Lisa-Maria Rebelo, *K&C Science Report – Phase 2 Characterisation of Inland Wetlands in Africa* 1, *available at* http://www.eorc.jaxa.jp/ALOS/en/kyoto/phase_2/KC-Phase-2_report_Rebelo.pdf.

⁹⁸ Brunnee & Toope, *supra* note 89, at 115.

⁹⁹ See Asim El Moghraby et al., *Information Sheet on Ramsar Wetlands*, KEY DOCUMENTS OF THE RAMSAR CONVENTION 2, 6 (2006), http://www.wetlands.org/reports/ris/1SD002_RISen06.pdf [hereinafter RAMSAR].

¹⁰⁰ Thirty thousand square kilometers is about 11,000 square miles, which is roughly the size of Maryland (9,707 square miles) and Delaware (1,949 square miles)

⁸⁹ Jutta Brunnee & Stephen J. Toope, *The Changing Nile Basin Regime: Does Law Matter*?, 43 HARV. INT'L L. J. 105, 117 (2002).

⁹⁰ Id.

⁹¹ John Allen, The Sudd Wetlands and Jonglei Canal Project Nile River Basin, Transboundary Water Resources (Mar. 30, 2010) (unpublished manuscript) (on file with author).

"one of the largest tropical wetlands in the World."¹⁰²

The seasonal flooding of the White Nile inundates the floodplains with nutrients¹⁰³ and is critical to the Sudd Region. This highly productive floodplain "contain[s] thick vegetation ... that feed[s] the many livestock in the region"¹⁰⁴ and supports an estimated one million people.¹⁰⁵ One group, the Nilotes who live in the Sudd region, depend completely on the Sudd wetlands for their cultural and economic activities.¹⁰⁶ The area's rich floodplains are also a food and water source for the Dinkas' pastoral lifestyle.¹⁰⁷ In terms of plants and animal species, the Sudd wetlands is home to the Suddia, a plant genus found only in the Sudd region.¹⁰⁸ The region also houses "one of the only water bodies of the Nile which is not overfished"¹⁰⁹ and is a fish repository for those living in the Sudd region.¹¹⁰ Countries farther downstream from the Nile also depend on the wetlands to act as the nursery for juvenile Nile River fish.¹¹¹ In terms of non-aquatic

¹⁰² Rebelo, *supra* note 97.

¹⁰³ See W.J. Junk & K.M. Wantzen, *The Flood Pulse Concept: New Aspects, Approaches and Applications – An Update*, 16 PROC. OF THE SECOND INT'L SYMP. ON THE MGMT. OF LARGE RIVERS FOR FISHERIES 117, 120 (2004).

¹⁰⁴ Allen, *supra* note 91.

¹⁰⁵ Rebelo, *supra* note 97. The area is also home to the "Nuer, Dinker, and Shilluk people who depend upon the wetlands and the seasonal flooding of the adjacent rich pastureland for their survival." *Wetlands Conserved, supra* note 101.

¹⁰⁶ Rebelo, *supra* note 97; RAMSAR, *supra* note 99, at 2-3 ("The occupants living within and adjacent to the Sudd region are almost exclusively Dinka, Nuer and Shilluk Pasturalism, fishing, game hunting and agriculture are the major economic activities. They depend on the annual floods and rains to regenerate floodplain grasses to feed their cattle. They move from their permanent settlements on the highlands to dry season grazing in the intermediate lands . . . at the beginning of the dry season and return to the highlands in May-June when the rainy season starts.").

- ¹⁰⁷ Rebelo, *supra* note 97.
- ¹⁰⁸ See RAMSAR, supra note 99, at 3.
- ¹⁰⁹ Rebelo, *supra* note 97.
- ¹¹⁰ *Id.*

¹¹¹ See id. ("Many fish species migrate from the surrounding rivers to the nutrient rich flood plains to feed and breed during the seasonal floods.").

combined. *See State and County QuickFacts*, 2010 UNITED STATES CENSUS BUREAU, http://quickfacts.census.gov/qfd/index.html (last visited Oct. 8, 2012).

¹⁰¹ See Southern Sudan's Vast Wetlands Conserved Under UN Treaty, ENV'T NEWS SERV., Nov. 1, 2006, http://www.ens-newswire.com/ens/nov2006/2006-11-01-04.html (last visited Aug. 22, 2012) [hereinafter Wetlands Conserved]. The Sudd wetlands include swamps and floodplains. See Rebelo, supra note 97.

life, the wetlands are "a wintering ground for birds of international and regional conservation importance, such as the great white pelican,"¹¹² the black crowned crane,¹¹³ the white-winged black tern,¹¹⁴ and others.¹¹⁵ Other animal species that depend on the Sudd region include the Mongalla gazelle, ¹¹⁶ African elephant,¹¹⁷ hippopotamus, and crocodile.¹¹⁸ Economically, South Sudan seeks to build up its tourism industry¹¹⁹ in order to capitalize on having the "second-largest land mammal migration."¹²⁰

The Nile River's seasonal flooding sustains South Sudan's unique wetlands, supporting its people and its developing tourism industry.¹²¹ The seasonal flooding also results in a substantial loss of water due to evapotranspiration,¹²² which reduces the White Nile's contribution of water to the Nile River.¹²³ Due to the high rates of evapotranspiration, the Nile River "carries by far the least amount of water in comparison to other great African rivers."¹²⁴ Compounding the problem of a naturally small water flow are the eleven riparian countries'¹²⁵ growing demands on the Nile.¹²⁶

¹¹⁹ See, e.g., Massive Migration Revealed, WILDLIFE CONSERVATION SOC'Y (June 12, 2007), http://www.wcs.org/news-and-features-main/massive-migration-revealed.aspx.

¹²⁰ All Things Considered: South Sudan Battles Poaching in Quest for Tourism, NAT'L PUB. RADIO (June 16, 2011), http://www.npr.org/2011/06/16/137220632/southsudan-battles-poaching-in-quest-for-tourism.

¹²¹ See id.

 122 More than 50% of the water in the wetlands is lost to evapotranspiration. Lamberts, *supra* note 17, at 4.

¹²³ See id. at 9.

¹²⁴ The major African rivers and their "average annual discharge" in billion cubic meters are the following: Congo, 1,200; Volta, 390; Zambezi, 230; Niger, 180; Nile, 84. *See* Ahmad, *supra* note 92, at 581.

¹²⁵ Burundi, Democratic Republic of Congo, The Republic of the Sudan, South Sudan, Rwanda, Egypt, Tanzania, Uganda, Ethiopia, Eritrea, and Kenya. *See* Christina M. Carroll, *Past and Future Legal Framework of the Nile River Basin*, 12 GEO. INT'L ENVTL. L. REV. 269, 270 (2000).

¹²⁶ See Brunnee & Toope, supra note 89, at 140 ("[T]he status quo on Nile water

¹¹² Wetlands Conserved, supra note 101.

¹¹³ RAMSAR, *supra* note 99, at 3.

¹¹⁴ *Id.*

¹¹⁵ *Id.*

¹¹⁶ Wetlands Conserved, supra note 101.

¹¹⁷ Id.

¹¹⁸ See RAMSAR, supra note 99, at 4.

In addition to securing its water resource through treaties with countries bordering the Blue Nile, Egypt also joined Sudan in the planning of the Jonglei Canal project.¹²⁷ Because more than fifty percent of the water in South Sudan is lost to evapotranspiration,¹²⁸ the Jonglei Canal would "divert water from the Sudanese marshes to reduce evapotranspiration."¹²⁹ If completed, the project would begin at Jonglei and channel the diffuse Nile waters into the Jonglei Canal.¹³⁰ This would prevent the White Nile from splitting into the Bahr al-Jabal and Bahr al-Zaraf rivers, and prevent the seasonal flooding.¹³¹ Thus, since its inception dating to the early 1900s, the Jonglei Canal has long been recognized as a way to increase the output from the White Nile¹³² with the ultimate purpose of sharing the water equally between Sudan and Egypt.¹³³

Because the former Sudan did "not even utiliz[e] all the water it is allocated under the current agreement,"¹³⁴ Egypt would likely be the primary beneficiary of the Jonglei Canal. Egypt's support for this project is shown by its willingness to pay up one-half of the cost and its miscellaneous investment in South Sudan through its building of vocational schools, power stations, and health centers.¹³⁵ Ethiopia's announcement of its plan to construct a dam on the Blue Nile¹³⁶ further supports the likelihood of the Jonglei

- Lamberts, *supra* note 17, at 4.
- ¹²⁹ Carroll, *supra* note 125, at 301.
- ¹³⁰ See Lamberts, supra note 17, at 10.
- ¹³¹ Ahmad, *supra* note 92, at 576.

use is recognized widely as unsustainable, largely because of population growth and growing irrigation."). For example, Egypt recognizes that it presently relies heavily on the Blue Nile's continual contribution to the Nile River as it flows through Egypt. In fact, Egypt has historically "been given predominance in deciding how the Nile is used; this is a holdover from [sic] colonial era where Britain entered into agreements with other colonial powers . . . to ensure 'water flow from the Congo into the Nile Basin."" *Id.* at 123.

¹²⁷ *Id.* at 126. For example, in 1891, Italy entered in a treaty with Britain promising to not engage in any activities that would prevent the Atbara River, in now-Ethiopia, from entering the Nile. *Id.* at 123.

¹³² See id.

¹³³ *Id.* at 578. Construction on the canal began in 1978 but was suspended in 1984 due to the Sudanese Civil War. *Id.*

¹³⁴ *Id.*

¹³⁵ *Id.* at 576.

¹³⁶ See Ker Than, Ethiopia Moves Forward with Massive Nile Dam Project, NAT'L GEO. MAG. (July 13, 2011), http://news.nationalgeographic.com/news/2011/07/110713-

Canal.

Though the Jonglei Canal would increase the water output by 4.7 billion cubic meters annually,¹³⁷ the first phase would decrease the "permanent marshes by 34-43 percent."¹³⁸ The second phase of the Jonglei Canal project would increase the water output to 43 million cubic meters per day, but completely deprive the Sudd wetlands of its water—thus destroying the Sudd wetlands.¹³⁹

Such drastic consequences have not been met with equally intense scientific studies or reports. For example, "a review of the work of Egyptian scientists found no mention of the possible damage to Sudan's ecosystems, or of changes in the hydrological regime, when they discuss drying out the 'swamps' to increase the Nile discharge."¹⁴⁰ A similar lack of investigation into negative environmental consequences was apparent in the former Sudanese government as well.¹⁴¹

Outside of the Jonglei Canal, other attempts at resolving water use and allocating water quantities among the countries have been largely unsuccessful.¹⁴² The Nile agreements that do exist are of questionable authority and applicability because they are bilateral, ignore the remaining Nile riparian players, and were created in the colonial era.¹⁴³ Even with the creation of the Nile Basin Initiative, current legal and policy systems are inadequate to solve the burgeoning water crisis these countries face.¹⁴⁴

¹⁴¹ See id. at 583. However, some benefits of the Jonglei Canal are that it could provide a source of water for livestock, and could reduce the area subject to flooding by ten to twenty percent. *Id.* at 576.

¹⁴² In 1929, Egypt and Sudan entered into a treaty that "distributed the Nile waters between Sudan and Egypt in a ratio of 1:12." *Id.* at 580. In 1959, the countries entered into another treaty that revised the ratio to 1:3 but failed to expand its applicability to other riparian countries. *Id.* Further, the 1959 Treaty neglected issues such as "water quality, flood control, or environmental protection." *Id.*

¹⁴³ Carroll, *supra* note 125, at 270.

See South Sudan Seeks Membership of the Nile Basin Membership, SUDAN TRIB.
(Sept. 24, 2011), http://www.sudantribune.com/South-Sudan-seeks-membership-

[/]ethiopia-south-sudan-nile-dam-river-water/.

¹³⁷ Ahmad, *supra* note 92, at 578.

¹³⁸ J.V. Sutcliffe & Y.P Parks, A Hydrological Estimate of the Effect of the Jonglei Canal on Areas of Flooding, in INSTITUTE FOR DEVELOPMENT ANTHROPOLOGY, NO. 5318 (1982).

¹³⁹ See Ahmad, supra note 92, at 576.

¹⁴⁰ *Id.* at 580.



Figure 2: The Sudd Wetlands and the Proposed Jonglei Canal¹⁴⁵

B. ICJ & UN Watercourse Convention

This section describes how the Convention on the Law of Non-Navigational Uses of International Watercourses (UN Watercourse Convention) will guide the ICJ in a transboundary water dispute and how the ICJ will use the UN Watercourse Convention.

1. UN Convention and its relationship with U.S. Interstate Water Law

In the face of those impending issues previously described, the UN Watercourse Convention was created in 1997.¹⁴⁶ It was "envisioned... as a basis for future regional agreements"¹⁴⁷ and sought to "provide a global normative framework for shared

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¹⁴⁵ Ahmad, *supra* note 92, at 577 (citing the map prepared by the Sudan Ministry of Irrigation and Water Resources Archives).

¹⁴⁶ G.A. Res. 229, U.N. GAOR, 51st Sess., Supp. No. 49, U.N. Doc. A/51/49 (May 21, 1997) [hereinafter Convention].

¹⁴⁷ Carroll, *supra* note 125, at 283.

freshwater."¹⁴⁸ Modeled after the United States's equitable apportionment doctrine,¹⁴⁹ the UN Watercourse Convention "express[es] the conviction that a framework convention will ensure the utilization, development, conservation, management and protection of international watercourses and the promotion of the optimal and sustainable utilization thereof for present and future generations."¹⁵⁰ In resolving conflicts, the UN Watercourse Convention is cognizant of developing countries and their needs.¹⁵¹

2. The International Court of Justice & Ecosystem Services

Like its American counterpart in the ACF dispute, future international equitable apportionment disputes submitted to the ICJ may be resolved under a more ecologically focused framework due to the backdrop against which it was written¹⁵² and as hinted at by the ICJ itself. This section shows how the ICJ's resolution of a transboundary water dispute reflects the likelihood that the ICJ will continue to recognize, and strengthen its consideration of, ecosystem factors in its equitable apportionment of the Jonglei Canal.

In 1997, Hungary and then-Czechoslovakia (Czechoslovakia) brought a transboundary water dispute before the ICJ.¹⁵³ The bilateral treaty, Treaty on the Construction and Operation of the Gabcikovo-Nagymaros Barrage System, between Hungary and Czechoslovakia arranged for the construction of the Gabcikovo-Nagymaros dam along the Danube River, which flows through both countries.¹⁵⁴ In 1989, Hungary terminated the treaty, citing, among other reasons, "principal ecological dangers which would have . . . seriously impaired [the quality of the ground water]."¹⁵⁵

¹⁴⁸ Brunnee & Toope, *supra* note 89, at 144.

¹⁴⁹ See Tarlock, supra note 14, at 237.

¹⁵⁰ Convention, *supra* note 146, at 2.

¹⁵¹ *Id.*

¹⁵² See Tarlock, supra note 14, at 237 ("The Convention attempts to incorporate more environmentally sensitive rules compared to past international water law principles.").

¹⁵³ Gabcikovo-Nagymaros Project (Hung./Slovk.), Judgment, 1997 I.C.J. 7 (Sept. 25).

¹⁵⁴ *Id.* at ¶ 77.

¹⁵⁵ *Id.* at ¶ 40.

Hungary also stated that "[a]s for the surface water, risks of eutrophication would have arisen... [t]he fluvial fauna and flora... would have been condemned to extinction... [and the operation of the power plant] would have constituted a threat to aquatic habitats."¹⁵⁶ Czechoslovakia then brought suit in the ICJ against Hungary for breaching the treaty.¹⁵⁷

Though the court did not equitably apportion the Danube, it did confirm that a country's right to its share of natural resources is a factor in any equitable apportionment of water use.¹⁵⁸ Furthermore, "[t]he ICJ's opinion... firmly establishes that international rivers are shared resources subject to the principle of equitable apportionment and that all riparian states have equal rights to enjoy both the commodity and non-commodity ecological benefits of the river, hydrologically connected groundwater, and the riparian corridors."¹⁵⁹ This case, then, confirms two important points: (1) ecosystem concerns are a valid component of the international equitable apportionment doctrine; and (2) in settling future international water disputes, the ICJ places importance on environmental factors.¹⁶⁰

Even though the UN Watercourse Convention has not been ratified, this comment examines what a resolution under the Convention might look like. The UN Watercourse Convention, modeled after the United States' equitable apportionment doctrine, and the Gabcikovo-Nagymaros case, stating that environmental factors will play a role in resolving future international water disputes,¹⁶¹ illustrate that the application of equitable apportionment in transboundary water disputes has received similar, if not identical, treatment in American and international courts.¹⁶² Therefore, the next section will use the different

¹⁶⁰ See Gabcikovo-Nagymaros Project (Hung./Slovk.), Judgment, 1997 I.C.J. 7, ¶ 85, 140 (Sept. 25); Tarlock, *supra* note 14, at 245.

- ¹⁶¹ See Tarlock, supra note 14, at 245.
- ¹⁶² See A. Dan Tarlock & Patricia Wouters, Are Shared Benefits of International

¹⁵⁶ Id.

¹⁵⁷ *Id.* ¶ 13.

¹⁵⁸ *Id.* at ¶ 85 ("The Court considers that Czechoslovakia, by unilaterally assuming control of a shared resource, and thereby depriving Hungary of its right to an equitable and reasonable share of natural resources of the Danube–with the continuing effects of the diversion of these waters on the ecology of the riparian area of the Szigetköz–failed to respect the proportionality which is required by international law.").

¹⁵⁹ Tarlock, *supra* note 14, at 245.

American equitable apportionment methods as a model for describing the three possible equitable apportionment resolutions to the Jonglei Canal dispute.¹⁶³

V. Application to the Jonglei Canal

This section describes the three possible methods of equitable apportionment as applied to the Jonglei dispute. The first analysis follows the traditional equitable apportionment doctrine, which recognizes environmental injury only where it relates to economic injury.¹⁶⁴ The second analysis is modeled after the Supreme Court's innovative method in *Idaho v. Oregon*, where the species itself is the resource to be equitably apportioned.¹⁶⁵ The third analysis applies the emerging trend of recognizing the value of ecosystem services.

Supporters of the last view fall into two positions. At one end is a desire to give ecosystem services such great weight that a natural flow regime¹⁶⁶ that neglects water capture is the only available solution.¹⁶⁷ At the other end, and the position this

¹⁶⁴ See Ruhl, supra note 9, at 52. Traditional equitable apportionment typically results in a minimum flow regime. See supra text accompanying note 88.

¹⁶⁵ See Idaho ex rel. Evans v. Oregon, 462 U.S. 1017, 1024 (1983).

¹⁶⁶ Natural flow regime is a term that captures the essential components of a river system and includes such characteristics as the following: "magnitude and seasonal pattern of flows; timing of extreme flows; the frequency, predictability, and duration of floods, droughts, and intermittent flows; daily, seasonal, and annual flow variability, and rates of charge in discharge events." Mark J. Kennard et al., *Classification of Natural Flow Regimes in Australia to Support Environmental Flow Management*, 55 FRESHWATER BIOLOGY 171, 172 (2010), *available at* http://www.watercentre.org/research/acedp/project-

resources/publications/KennardEtal2010.pdf. Altering such natural flow regimes has harmful environmental, and ecological consequences. N. LeRoy Poff et al., *The Natural Flow Regime: A Paradigm for River Conservation and Restoration*, 47 BIOSCIENCE 769, 770 (2010), *available at* http://www.fs.fed.us/stream/Poffetal_1997.pdf.

 167 *E.g.*, Ruhl, *supra* note 9, at 55 (proposing that given "today's greater understanding of the role and value of ecosystem services that instream water provides . . . the Court should be more than willing to move beyond the minimum base

Waters an Equitable Apportionment[?], 18 COLO. J. INT'L ENVTL. L. & POL'Y 523, 525 (2007) ("International water law is derived from United States Supreme Court jurisprudence, ironically itself based on international law."). For example, both jurisdictions have formerly resolved disputes under traditional equitable apportionment frameworks. This comment argues that both should continue monitoring the other and update their respective equitable apportionment doctrines by placing more weight on environmental factors.

¹⁶³ See Tarlock, supra note 14, at 237.

comment takes, is that a river management plan that mimics a natural flow regime but also allows for some water capture is best. This comment predicts that the ICJ will give ecosystem services greater weight in the equitable apportionment prong such that resolution of a dispute between pro- and anti-Jonglei Canal parties will be a compromise between minimum and natural flow regimes. In order to maintain the ecological integrity of the Sudd region, this comment advocates for a river management plan that moves beyond a mere compromise to one that mimics the natural flow regime of seasonal flooding.¹⁶⁸ Such a compromise would balance the competing water uses by allowing local development while also ensuring a healthy and functioning ecosystem.

In resolving conflicts under any of the three equitable apportionment frameworks, the Supreme Court in *Idaho ex rel. Evans v. Oregon* put forth three "foundational principles" regarding states' rights towards other states:

First, a state may not preserve solely for its own inhabitants the natural resources located within its borders. Second, no state has inherent priority, absolute or presumptive, over another state in the use of water from an interstate stream. Third, all states have the affirmative duty to take reasonable steps to conserve prospective water use, and even to augment water supply, as a condition to making a successful claim to a fair share of an interstate water.¹⁶⁹

Similarly, international water law disputes resolved under the UN Watercourse Convention adhere to these guiding principles set forth in *Idaho v. Oregon*.

A. Traditional Equitable Apportionment Analysis

Under the traditional analysis,¹⁷⁰ environmental injuries that yield economic injuries are considered "real and substantial injury or damage."¹⁷¹ The Supreme Court in *New Jersey v. New York* found that New York's proposed diversion of the Delaware River

flow criterion to one embracing the natural flow regime").

¹⁶⁸ For example, such a plan may allow a higher percentage of water capture in times of non-seasonal flooding while requiring South Sudan to release water in quantities that mimic the seasonal flooding of the Sudd region.

¹⁶⁹ Ruhl, *supra* note 9, at 51.

¹⁷⁰ See supra Part I.C.

¹⁷¹ Idaho ex rel. Evans v. Oregon, 462 U.S. 1017, 1018 (1983).

would increase river salinity, which would cause the "injury of the oyster industry there . . . [and would] injure the shad fisheries."¹⁷² The Court found these injuries, among others, were "greater than New Jersey ought to bear."¹⁷³

Similarly, the downstream riparian countries depending on the natural flow of the Nile may formulate their substantial injury in economic terms by stating that their tourism industry relies on the availability of the Sudd wetlands and will falter without it. Following *New Jersey*, the ICJ is likely to consider this potential economic loss a substantial injury.

In equitably apportioning the water source, however, because the *New Jersey* Court found that "[b]oth States have real and substantial interests in the River that must be reconciled,"¹⁷⁴ and damage to New Jersey's oyster industry could be "removed" by reducing the diversion, New York was permitted to divert the Delaware River so long as it did not exceed the specified minimum flow rate.¹⁷⁵ Because the Jonglei Canal is designed to proceed in two phases, with the first phase reducing the permanent marshland size by 34% to 43%,¹⁷⁶ the ICJ may find that some diversion of water from the Sudd wetlands is permissible, as long as a minimum water flow prevents or mitigates whatever substantial injury the contesting party is alleging.

Furthermore, countries supporting the Jonglei Canal would argue that an equitable apportionment of water use taking into account factors relevant to them, examples of which are listed in Article 6(1) of the UN Watercourse Convention, would weigh in their favor.¹⁷⁷ For example, Sudan and Egypt may argue that their

(a) Geographic, hydrographic, hydrological, climatic, ecological and other factors of a natural character; (b) The social and economic needs of the watercourse State concerned; (c) The population dependent on the watercourse in each watercourse State; (d) The effects of the use or uses of the watercourses in one watercourse State on other watercourse states; (e) Existing and potential uses of the watercourse; (f) Conservation, protection, development and economy of use of the water resources of the watercourse and the costs of

¹⁷² New Jersey v. New York, 283 U.S. 336, 343-44 (1931).

¹⁷³ *Id.* at 345.

¹⁷⁴ *Id.* at 342-43.

¹⁷⁵ *Id.* at 345.

¹⁷⁶ Ahmad, *supra* note 92, at 576.

¹⁷⁷ The UN Watercourse Convention lists factors for a court to take into account in Article 6 including:

"social and economic needs,"¹⁷⁸ a factor listed in Article 6(1)(b) of the UN Watercourse Convention, may depend upon the increased water volume provided by the potential channelization of the White Nile. Ethiopia may argue that the Jonglei Canal will free Egypt's dependence on Ethiopia's portion of the Blue Nile, finally allowing Ethiopia to grow its hydroelectric industry through the planned Blue Nile Dam.¹⁷⁹ Moreover, in the United States, the Supreme Court explicitly recognizes growth potential as a factor under this prong. In *Colorado v. New Mexico*,¹⁸⁰ the Court rejected New Mexico's argument that New Mexico should receive all the apportioned water use on grounds that there was "no existing economy in Colorado dependent upon the use of water."¹⁸¹ Therefore, an international court will likely allow construction based on a nation's potential for growth.

Other factors in the UN Watercourse Convention that supports construction of the Jonglei Canal can be found in Article 6(1)(d), which considers how use of the watercourse in one state will affect other states who use it,¹⁸² and Article 6(1)(g), which instructs parties to examine the availability of alternatives for current or intended use.¹⁸³ Under Article 6(1)(d), supporters of the canal would state that the increased water flow would provide more water for South Sudan, the Republic of Sudan, and Egypt, in addition to freeing Ethiopia from the burden of supplying Egypt with 84% of the Nile's waters.¹⁸⁴ Furthermore, canal advocates

- ¹⁸⁰ Colorado v. New Mexico, 459 U.S. 176, 182 (1982).
- ¹⁸¹ *Id.* at 184.
- ¹⁸² Convention, *supra* note 146, at 5.

measures taken to that effect; (g) The availability of alternatives, of comparable value, to a particular planned or existing use.

Convention, *supra* note 146, at 5. Like the factors listed above, these guiding factors in the UN Watercourse Convention are "merely an illustrative[,] not an exhaustive[,] catalogue." Nebraska v. Wyoming, 325 U.S. 589, 618 (1945). Furthermore, "[t]hey indicate the nature of the problem of apportionment and the delicate adjustment of interests which must be made." *Id.*

¹⁷⁸ Convention, *supra* note 146, at 5.

¹⁷⁹ Than, *supra* note 136 ("Ethiopia has announced that it will construct a controversial multibillion-dollar Nile River dam that could supply more than 5,000 megawatts of electricity for itself and its neighbors.").

¹⁸³ *Id.* (providing as a consideration "[t]he availability of alternatives, of comparable value, to a particular planned or existing use").

¹⁸⁴ See generally id. at 5 (stating that "the effects of the use or uses of the watercourses in one watercourse State on other watercourse States" are important

would argue that water conservation measures would not be sufficient to supply the water needs for the increasing populations of Egypt¹⁸⁵ and of South Sudan. For these reasons, advocates would argue that applying Article 6(1)(d) reveals that no real available alternative of comparable value exists.

On the other hand, the Sudd wetlands possess unique geographic and ecological characteristics as one of the largest tropical wetlands in the world and the largest wetland in Africa; Article 6(1)(a).¹⁸⁶ addressed in these considerations are "[g]eographic, hydrographic, Information regarding the hydrological, climatic, ecological, and other factors of a natural character"¹⁸⁷ cannot be considered because studies conducted by the Sudanese and Egyptian governments were not objective in their analysis.¹⁸⁸ The lack of a comprehensive study also factors into Article 6(f), the "conservation, protection, development and economy of use of the water resource."¹⁸⁹ Even though South Sudan asserts that the canal is needed for its economy, factors affecting the "social and economic needs of the watercourse" of South Sudan under Article $6(b)^{190}$ may be diluted based on the unrelenting influence richer countries impose on South Sudan.¹⁹¹ Other factors like Article 6(c), the "population dependent on the watercourse in each watercourse State,"¹⁹² weigh heavily in favor of the anti-Jonglei Canal parties because of the Dinka, Nuer, and

considerations).

¹⁸⁵ See Brunnee & Toope, supra note 89, at 143.

¹⁸⁶ Convention, *supra* note 146, at 5 (stating that "[g]eographic; hydrographic, hydrological, climatic, ecological and other factors of a natural character" are important factors to consider); *see also supra* Part III.

¹⁸⁷ See Convention, supra note 146, at 5.

¹⁸⁸ Ahmad, *supra* note 92, at 580 ("[R]eview of the work of Egyptian scientists found no mention of the possible damage to the Sudan's ecosystems, or of changes in the hydrological regime, when they discuss drying out the 'swamps' to increase the Nile discharge."). Furthermore, "no environmental impact assessment has been conducted." *Id.* at 583.

¹⁸⁹ See Convention, supra note 146, at 5.

¹⁹⁰ *Id.* (Article 6(1)(b) provides, "[t]he social and economic needs of the watercourse States concerned.").

¹⁹¹ See Ahmad, supra note 92, at 581 ("Using various pretexts, high-income countries keep seeking to establish an early foothold in this emerging oil state. [This interest] offers partnerships and . . . introduces powerful parties . . . into relationships that were hitherto bilateral, with the Sudan usually the weaker party.").

¹⁹² See Convention, supra note 146, at 5.

Shilluk people that depend heavily on the Sudd wetlands.¹⁹³ Article 6(d) does not provide much support for the opposition. Rather, the canal will improve other watercourse states' uses of the Nile.

Generally, in applying the equitable apportionment that accounts for relevant circumstances and factors, courts have weighed a nation's potential for growth and development more heavily.¹⁹⁴ Thus, an international court would most likely find, at minimum, that Phase I of the Jonglei Canal may be constructed.

B. Idaho Method

Keeping in mind that the method undertaken by the United States Supreme Court in *Idaho* has not been duplicated, a different result may occur under the *Idaho* Court's method of equitable apportionment. In *Idaho*, the Supreme Court found that fish are a resource to be equitably apportioned,¹⁹⁵ and that "[e]ven though Idaho has no legal right to the anadromous fish hatched in its waters, it has an equitable right to a fair distribution of this important resource."¹⁹⁶

As in the traditional equitable apportionment analysis, the *Idaho* Court first determined whether Idaho, in bringing the claim for an equitable apportionment of the anadromous fish, "carried its burden of demonstrating a substantial likelihood of injury"¹⁹⁷ based on present and future conditions.¹⁹⁸ Rather than determining whether reduced water flow caused the injury, the court limited the scope of the reduced fishing harvest injury to whether the injury was "caused by mismanagement or overfishing by Washington and Oregon."¹⁹⁹ The Court held that Idaho failed to satisfy the injury requirement because records show that their fishing harvest actually increased during the alleged injurious

¹⁹³ See RAMSAR, supra note 99, at 2-3.

¹⁹⁴ See Colorado v. New Mexico, 459 U.S. 176, 184-85 (1982) (holding that it is proper to consider the future benefits a project may bring).

¹⁹⁵ Idaho ex rel. Evans v. Oregon, 462 U.S. 1017, 1024 (1983).

¹⁹⁶ Id. at 1025.

¹⁹⁷ Id. at 1029.

¹⁹⁸ See id. at 1026 ("Reliance on reasonable predictions of future conditions is necessary to protect the equitable rights of a State.").

¹⁹⁹ *Id.* at 1028.

timeframe.²⁰⁰

In the Jonglei case, the ICJ will determine whether the injury prong has been met based on the present conditions of the area and on future predictions of decreased animal numbers.²⁰¹ As backdrop to the injury inquiry, the ICJ will also recognize that the fair distribution of an animal or plant species is not tied to a country's or party's legal rights, as held in *Idaho*.²⁰² Thus, if countries opposing the Jonglei Canal can show that their local economies depend on animal or plant harvests, and that these numbers are predicted to decrease during construction and completion of the canal, the ICJ will likely determine that the first prong has been met.²⁰³ If a court determines that the link between decreased animal numbers and the decreased wetland size is too tenuous, tracing the injury to the construction of the Jonglei Canal itself will likely succeed.²⁰⁴

Parties bringing suit may have more difficulty meeting the first prong if the alleged injury is only tenuously connected to the canal, like the tourism industry.²⁰⁵ In *Idaho*, injury was established from a direct connection between the reduced fishing numbers and the mismanagement or overfishing of the fishing industry.²⁰⁶ Here, the link between the economic injury to the tourist industry and the decreased species numbers is more attenuated. A party must show substantial injury through "clear and convincing evidence."²⁰⁷ In order to do so, parties must show that the decreased Sudd wetland size or the construction of the Canal itself causes a total or disproportionate reduction in

²⁰⁰ *Id.* at 1028-29.

²⁰¹ See Idaho ex rel. Evans. v. Oregon, 462 U.S. 1017, 1024 (1983).

²⁰² See id. at 1025.

²⁰³ See generally id. at 1028-29 (requiring a showing of an actual decrease in the harvest in order to establish an injury).

²⁰⁴ In *Idaho*, the Court required a direct link between the injury and its cause by requiring Idaho to link its injury to Oregon or Washington's overharvesting or mismanagement. *Id.* Thus, in order to state a sufficient injury, countries bringing suit must have a direct connection to the Jonglei Canal. Construction of the canal would be sufficient to establish injury, rather than requiring a party to trace the injury to the changed water flows.

²⁰⁵ See generally id. at 1028-29 (requiring a direct link between the injury and Oregon or Washington's activities).

²⁰⁶ See id. at 1028-29.

²⁰⁷ See Colorado v. New Mexico, 459 U.S. 176, 187 (1982).

tourism.²⁰⁸

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Assuming the first prong is met, an international court would "weigh the harms and benefits to competing states"²⁰⁹ using the factors listed in Article 6 of the UN Watercourse Convention.²¹⁰ The benefits to the Jonglei Canal discussed in Part (a) of this section remain the same. What follows are detriments in addition to those discussed in Part (a). Under Article 6(c), "populations dependent on the watercourse" would include animal populations dependent on the Sudd wetlands in addition to human populations.²¹¹ Similarly, courts may allow consideration of uses by animal species in determining the "[e]xisting and potential uses of the watercourse" under Article 6(e).²¹² Because American courts rarely prohibit economic growth solely based on injury to the other party, preferring instead to reach a compromised solution,²¹³ the ICJ will likely allow Phase I of the Jonglei Canal to proceed under this analysis.

C. Emergence Analysis

Against the backdrop of past environmental disasters,²¹⁴ and in keeping with a movement towards recognizing environmental claims,²¹⁵ "[t]he Convention attempts to incorporate more

- 211 See id.
- ²¹² See id.
- ²¹³ See Colorado, 459 U.S. at 182-84.

²¹⁴ In 1953, the Iraqi government began construction of a marshland-draining project that continued into the 1980s. The Iraqi Government Assault on the Marsh Arabs, HUMAN RIGHTS WATCH (Sept. 2003), www.hrw.org/ legacy/backgroung/mena/marsharabs1.htm. Progress stalled due to the Gulf War, but the "hydro-engineering program . . . to drain the marshlands" officially began in 1991. Id. Draining the marshlands essentially ended the Marsh Arabs' "traditional subsistence lifestyle" by removing the marshland's ability to support the "fishing, cultivation, buffalo breeding, and reed gathering" they practiced. Id. Despite the destruction of their traditional lifestyle, some Marsh Arabs remained behind. Id. The Iraq government then conducted secret attacks, driving the Marsh Arabs from the region. Id. These attacks involved "causing explosions," "demoli[shing] or burning homes," and "imposing a ban on the sale of fish." Id. Similar human rights violations may occur if the South Sudan government does not achieve consensus from local groups that live and depend on the Sudd wetlands.

²¹⁵ Gabcikovo-Nagymaros Project (Hung./Slovk.), Judgment, 1997 I.C.J. 7 at 53 (Sept. 25) (noting that the ICJ recognized that Hungary has a right to its share "of the

²⁰⁸ See Idaho, 462 U.S. at 1028-29.

²⁰⁹ Colorado, 459 U.S. at 186.

²¹⁰ See Convention, supra note 146, at 5.

environmentally sensitive rules compared to past international water law principles."²¹⁶ As a result, this comment advocates that a forward-looking international court should resolve any future Jonglei dispute in a manner that strongly recognizes and maintains the ecosystem services the Sudd wetlands provide in addition to allowing the channelization of some of the Nile River.

In a system where ecosystem services are considered, meeting the substantial injury requirement would require a showing, by "clear and convincing evidence" under present conditions, that the ecosystem services the Sudd wetlands provide would be injured if the Jonglei Canal were constructed or completed.²¹⁷ This injury requirement would be easily met once ecosystem services are properly valued.²¹⁸

Similarly, under the second prong, once ecosystem services are given their due weight, the weighing of factors would result in a more equal distribution between the pro- and anti-Jonglei Canal actors.²¹⁹ For example, ecosystem services would be a factor under Article 6(1)(a), (c), (d), and (e).²²⁰ The relationship between Article 6(1)(a) and the role of ecosystem services was previously described in part (a) of this section. Under Article 6(1)(c), the populations dependent on the ecosystem services the watercourse provides would be considered here.²²¹ Similarly, Article 6(1)(d) would consider the effects ecosystem services provide in "one watercourse State on other watercourse States."²²² Under Article 6(1)(e), the services the ecosystem provides to human populations would serve as additional factors relevant under the "[e]xisting... uses of the watercourse."²²³

Again, it is unlikely that a court would completely prevent

²²³ Id.

natural resources of the Danube").

²¹⁶ Tarlock, *supra* note 14, at 237 (citing International Law Comm'n, *The Law of the Non-Navigational Uses of International Watercourses*, 3 COLO. J. INT'L ENVTL. L. & POL'Y 1 (1992)).

²¹⁷ *Colorado*, 459 U.S. at 187-88.

²¹⁸ See Ruhl, supra note 9, at 52-53.

²¹⁹ See Colorado, 459 U.S. at 189-91 (explaining the factors to consider when weighing the injury and benefit).

²²⁰ See Convention, supra note 146 at 5.

²²¹ See id.

²²² Id.

development based on injuries to ecosystem services alone.²²⁴ Upon recognizing ecosystem factors, however, a court would be more likely to create a resolution that is a compromise between the two competing views—a final equitable apportionment that allows for some development, but also maintains a healthy and functioning level of ecosystem services.²²⁵

VI. Conclusion

With the independence of South Sudan, construction of the Jonglei Canal is increasingly likely as the burgeoning nation seeks to assert itself. Despite the drawbacks to the Jonglei Canal, and the ensuing draining of the Sudd wetlands, the ICJ is unlikely to completely prohibit construction of the canal. Rather, the ICJ should follow the trajectory it set in the Gabcikovo-Nagymaros case by emphasizing ecological factors in the equitable apportionment doctrine to accurately reflect the true value of healthy ecosystems.²²⁶ Such an equitable apportionment would balance the economic and developmental needs of South Sudan while taking into account the existing ecological uses of the Sudd wetlands.

Similarly, the ACF dispute is an opportunity for the United States to update its equitable apportionment doctrine to better reflect the value of ecological factors.²²⁷ For example, an ecologically-sensitive equitable apportionment would balance local dependence on the wetlands, by providing nurseries and habitat for fish, oysters, and shrimp, with the growing urban centers' increased water-use needs. An equitable apportionment of such water use, then, would be sufficient to continue supporting both these activities.

²²⁴ See Colorado, 459 U.S. at 182-84 (stating that all "relevant factors" must be considered when reaching an arrangement).

²²⁵ Maintaining a healthy and functioning level of ecosystem services will likely require more than minimum water flows. *See* Ruhl, *supra* note 9, at 52-53. It is highly unlikely the ICJ would prevent South Sudan from developing the Sudd region. Rather, the ICJ will likely require a compromise between the natural flow regime and the minimum water flow regime such that the equitable apportionment of water use will maintain a healthy wetland ecosystem and allow simultaneous development of the Jonglei Canal.

²²⁶ The Sudd wetlands provide ecosystem services like purifying water, providing habitat for iconic African animal and plant species, and supporting local human populations. *See supra* Part III.

²²⁷ See Ruhl, supra note 9, at 52-53.

Thus, in recognition of these valuable ecological services, the ICJ should allocate some use of the Nile in a manner that mimics a natural flow regime to ensure a healthy and functioning ecosystem.