

Northwestern Journal of International Law & Business

Volume 17

Issue 1 *Winter*

Winter 1997

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Recommended Citation

Niveen Tadros, Shrinking Water Resources: The National Security Issue of this Century, 17 Nw. J. Int'l L. & Bus. 1091 (1996-1997)

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Shrinking Water Resources: The National Security Issue of this Century

*Niveen Tadros**

INTRODUCTION

There are several places in the world where war could erupt over a dwindling supply of clean water from shared water resources. As one nation after another finds itself reaching its water resource limits, the potential for conflict among them intensifies. Add to already scarce reserves pollution of the water source, and the global picture appears more menacing. In fact, public health officials attribute almost 80% of illnesses in developing countries to contaminated water;¹ the United Nations Children's Emergency Fund (UNICEF) reports that more than 35,000 children all over the world die every day from hunger or disease caused by lack of or contamination of water.² Whole populations and industries are currently struggling to balance the demands for technology and advancement against the risk of widespread and uncontrollable pollution of major water sources.³

There is little disagreement that the environment, and specifically the shortage of fresh water, is for many nations the national security issue of the twenty-first century.⁴ "The only matter that could take Egypt to war again is water," declared Anwar Sadat in 1979, only days after signing the historic peace treaty with Israel.⁵ Since then, there have been constant threats back and forth among Egypt, Sudan, and

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¹ Joyce Starr, *Nations Must Join Together for Water Conservation and Sharing Projects to Promote World Peace*, THE CHRISTIAN SCIENCE MONITOR, May 27, 1992, at 12.

² *Id.*

³ See Egypt's Water Supply: Demand for Pollution Control and Purification Equipment, 16 MIDDLE EAST EXECUTIVE REPORTS 8, 9-10 (August, 1993) [hereinafter ME Exec Reps, August 1993].

⁴ *Id.*

⁵ Starr, *supra* note 1.

Ethiopia over Nile water allocation.⁶ Today, the countries in the Nile river basin are on the brink of conflict over their share of its water.⁷

The Nile river basin is a prime example of a scarce water resource severely affected by high levels of pollution from many different sources.⁸ Heavy dependence on the river, a burgeoning population growth rate, and rapid industrial and commercial growth which occurred without concern for environmental consequences have contributed to the significant deterioration of the Nile.⁹ Moreover, the rising pollution concentration compounds the problem of scarcity because pollutants make whatever water is available too contaminated for use.¹⁰

The international community is attempting to find solutions to the problems of low water quantity and poor water quality. Billions of dollars have been allocated to the Nile river basin states to help control rising pollution levels and preserve the river as the major source of fresh water.¹¹ In addition, organizations such as the International Law Association (ILA), the International Law Commission (ILC), and the United Nations Environment Programme (UNEP) are focusing their attention on problems arising along international river basins.¹² Presently, more than 300 international treaties deal with specific international water issues and over 2,000 treaties deal at least in part with water.¹³ Some of these treaties have effectively resolved conflicts between basin states over water allocation. However, others, such as those concerning the Nile, have proven inadequate.

⁶ Tom Hundley, *Water May Be the Next Flashpoint in Mideast*, CHICAGO TRIBUNE, Feb. 2, 1992, at 1.

⁷ *Sudan Threatens to Revoke Nile Water Agreement*, THE FIN. TIMES LTD., July 12, 1995, at 9.

⁸ *Nile River Pollution Linked to the Aswan High Dam*, MONEYCLIPS, Dec. 3, 1992. A report by the Specialized National Councils on pollution along the Nile linked the rising level of pollutants to the establishment of the Aswan Dam. The Dam has caused the river to move slowly, which in turn has caused the accumulation of pollutants. Other factors contributing to the pollution included discharge of waste materials, (the seriousness of which depends on the type of industry), the amount of waste discharged, abuse of fertilizers, river vegetation, sewage, and wastes discharged by Nile cruisers and floating hotels. *Id.*

⁹ ME Exec Repts, August 1993, *supra* note 3, at 8.

¹⁰ *Id.*

¹¹ *Id.* at 9-10. Over the last 14 years the United States Agency for International Development (USAID) has been the largest donor for urban projects which treat water in Cairo, Alexandria, and other medium size cities. *Id.* USAID has invested approximately \$2 billion dollars. *Id.*

¹² Andrew W. Samaan, *Enforcement of International Environmental Treaties: An Analysis*, 5 FORDHAM ENVTL. L.J. 261, 262-68 (1993).

¹³ Pamela LeRoy, *Troubled Waters: Population and Water Scarcity*, 6 COLO. J. INT'L ENV'T'L L. & POL'Y 299, 319 (1995).

Currently, the Nile basin states must look at ways to draft regional water sharing agreements that also provide a framework for pollution control.¹⁴ Until recently, all the Nile agreements focused strictly on water allocation and failed to adequately address pollution control. Egypt, the country farthest downstream, has led the effort to draft new international water allocation agreements that include pollution control schemes.¹⁵ However, Egypt cannot win this fight alone. Former United Nations Secretary General Boutros Boutros-Ghali, while serving as Egypt's Minister of State for Foreign Affairs in 1989, told the United States Congress that "the national security of Egypt is in the hands of the eight other African countries in the Nile basin."¹⁶ Because it is the country farthest downstream, Egypt's attempts to control pollution along the Nile will be futile unless it is joined by the remaining Nile basin states.¹⁷

This article addresses the pollution problem along international water basins by looking specifically at the Nile river basin states, and examines the possibilities for cooperation in preventing a catastrophe. Part I reviews the status of the Nile river pollution problem and surveys the principles and treaties which currently govern the Nile basin states. Part II surveys existing international water law principles available for adoption by these states. Part III analyzes the shortfalls of current international water law principles, and suggests provisions of a treaty. Part IV proposes the establishment of a forum for resolution and enforcement of international agreements.

I. CURRENT STATE OF THE NILE RIVER BASIN STATES

The Nile has fueled much of the socio-economic growth of the basin states, but has also generated much debate and tension. The source of water for millions of people in Africa, it is shared by nine basin states, including Egypt, Sudan, Ethiopia, Kenya, Zaire, Tanzania, Burundi, Rwanda, and Uganda.¹⁸ The Blue Nile and the

¹⁴ According to statistics from the Cairo Liver Institute, the Nile river pollution is contributing to the growth of disease, and particularly hepatitis, among Egypt's population. Cherif J. Cordahi, *Egypt: Environmentalists Say River Pollution is Increasing Disease*, INTER PRESS SERVICE, June 7, 1993, available in LEXIS, NEWS Library, INPRES File.

¹⁵ ME Exec Repts, August 1993, *supra* note 3, at 8.

¹⁶ LeRoy, *supra* note 13, at 312.

¹⁷ Nashwa Hanna, *Egypt Minister Calls for Water Strategy*, UNITED PRESS INT'L, Aug. 3, 1995, available in LEXIS, WORLD Library, UPI File. A Minister of the Egyptian government has called for a new strategy in the relations among the Nile river basin states in order to prevent a water shortage and to provide Egypt with its 'basic' needs by the end of this century. *Id.*

¹⁸ Dante A. Caponera, *Legal Aspects of Transboundary River Basins in the Middle East: the Al Asi (Orontes), the Jordan, and the Nile*, 33 NAT. RESOURCES J. 629, 650 (1993); L. Kukk &

White Nile are the two major tributaries of the River.¹⁹ The Blue Nile originates from Lake Tana in Ethiopia, and the White Nile flows from the great lakes of Central Africa (Lake Victoria, Kagra, Victoria-Nile, Lake Mobuta, Sese Seko, Albert-Nile, Bahr-el-Ghazal, Bahr-el-Zeraf, and the White Nile) and is shared by Kenya, Rwanda, Tanzania, and Uganda.²⁰ The Nile technically begins where the Blue Nile and the White Nile meet, in Khartoum, Sudan, and flows out through Egypt toward the Mediterranean Sea.²¹

A. Colonial Developments — through 1959 Agreement

British colonial control of Africa shaped the history of the Nile basin states. After gaining control of Egypt in 1882, the British struggled for nearly two decades to subdue the sparsely populated Sudan and gain control over the Nile's headwaters.²² In 1929, the British and Egyptian governments reached an agreement assuring British control of Sudan predicated on Sudan's subordination to Egypt's dominant position of the Nile.²³ Ultimately the following clause of the agreement preserved Egypt's traditional and historic uses and granted Egypt the power to reject developments in Sudan and other upper riparian states:

Save with the previous agreement of the Egyptian Government no irrigation or power works or measures are to be constructed or taken on the River Nile or its branches, or on the lakes from which it flows so far as all these are in the Sudan or in countries under British administration, which would, in such a manner as to entail prejudice to the interests of Egypt, either reduce the quantities of water arriving in Egypt, or modify the date of its arrival, or lower its level.²⁴

David A. Deese, *At the Water's Edge: Regional Conflict and Cooperation Over Fresh Water*, 1 UCLA J. INT'L & FOR. AFF. 21, 41 (1996). Only the Danube, the Niger, and the Zaire rivers have as many or a greater number of basin states sharing their waters. *Id.*

¹⁹ Kuk & Deese, *supra* note 18, at 41-42.

²⁰ *Id.*

²¹ *Id.*

²² Joseph Dellapenna, *Treaties as Instruments for Managing Internationally-Shared Water Resources: Restricted Sovereignty v. Community of Property*, 26 CASE W. RES. J. INT'L L. 27, 48 (1994). The British began work to extend irrigation in Sudan after obtaining agreement from the basin states controlling various sources of the Nile not to change the Nile waters without British consent. *Id.*

²³ *Id.*

²⁴ Lisa M. Jacobs, *Sharing the Gifts of the Nile: Establishment of a Legal Regime for Nile Waters Management*, 7 TEMP. INT'L & COMP. L.J. 95, 109 (1993) (quoting the text of the British High Commissioner in Cairo, Lord Lloyd's note, reprinted in U.N. Legislative Series: Legislative Texts and Treaty Provisions Concerning the Utilization of International Rivers for Other Purposes than Navigation, at 107, U.N. Doc. ST/LEG/SER.B/12 (1963)).

Under the provisions of the treaty Egypt was allocated 48 billion cubic meters (hereafter BCM) annually of water while Sudan could use only 4 billion cubic meters.²⁵ Though the agreement clearly favored Egypt, it was accepted by Sudan, and put an end to years of violence and negotiation on the matter.²⁶

However, when Sudan gained independence in 1953, it demanded modification of the restrictions set forth in the 1929 Agreement.²⁷ This demand resulted in the Agreement of 1959 between Sudan and Egypt.²⁸ The new agreement included reciprocal consent to new dams in each country: the High Dam at Aswan in Egypt and a new dam on the Blue Nile in Sudan.²⁹ In addition, the Agreement allocated between Sudan and Egypt the flow of the Nile and set forth Egypt's historical right to the Nile waters.³⁰ The Agreement provided for full utilization of the Nile waters, allocated 55.5 BCM of water to Egypt and 18.5 BCM to Sudan, and did not reserve any share for the upstream riparians.³¹ The Agreement further sought to present a united front to other Nile basin states, stating:

[B]oth republics agree to study together [the claims of the Nile basin states] and adopt a unified view thereon. If such studies result in the possibility of allotting an amount of water to one or the other of the territories, then the value of this amount at Aswan shall be reduced in equal shares from the share of the two Republics.³²

While this Agreement solved the problems between Sudan and Egypt, it failed to address specifically the rights of any of the other riparians, mainly Ethiopia.³³

²⁵ *Id.* at 109.

²⁶ *Id.*

²⁷ Dellapenna, *supra* note 22, at 48. Sudan specifically objected to the planned Aswan High Dam, fearing that it would flood parts of Sudan. *Id.*

²⁸ Agreement for the Full Utilization of the Nile Waters, Nov. 8, 1959, Sudan-Egypt, 453 U.N.T.S. 51, 51, *reprinted in* U.N. Department of Technical Co-Operation for Development; Natural Resources/Water Series No. 13: Treaties Concerning the Utilization of International Watercourses for Other Purposes Than Navigation: Africa at 92, U.N. Doc. ST/ESA/141, U.N. Sales No. E.F.84.II.A.7 (1984) [hereinafter 1959 Nile Waters Agreement].

²⁹ *Id.* at art. 2.

³⁰ *Id.* at art. 1; Caponera, *supra* note 18, at 657-59.

³¹ 1959 Nile Waters Agreement, *supra* note 28; Caponera, *supra* note 18.

³² 1959 Nile Waters Agreement, *supra* note 28, at art. 5.

³³ LeRoy, *supra* note 13, at 319.

B. Problems with Other Agreements, 1959 — present

Other attempts and agreements made to include the remaining states in projects and discussions have also failed.³⁴ Specifically, two problems plague the existing agreements. First, these agreements do not include all the Nile states. Second, in the main, these agreements pertain to water allocation, neglecting to adequately address the growing pollution problem.³⁵

1. *Failures to Include and Address the Rights of All the Basin States*

To date, there is no agreement or treaty that includes all of the basin states, nor is there one that is recognized and accepted by the excluded states.³⁶ Thus, the Nile basin states must look towards developing a comprehensive agreement that addresses the rights of all the basin states.

In the past, comprehensive agreement proved difficult to accomplish for two reasons. First, Egypt firmly and consistently asserted its superior "historical" rights to the Nile water.³⁷ Many of the Agreements that endorsed this "historical" right were drafted while most of the African colony was under British rule. During this time, Egypt's claim to the Nile was favored in treaty arrangements because the British were anxious to preserve their position of control over the Suez canal.³⁸

³⁴ Caponera, *supra* note 18, at 659. The relevant agreements that are in existence today include: the 1959 Nile Waters Agreement, *supra* note 28; Treaty of 1977 Establishing the Kegera River Basin Organization between Burundi, Rwanda, Tanzania, and Uganda Concerning the Development of the White Nile; Agreement of December, 1992 Setting up a Technical Cooperation Committee for the Promotion of the Development and Environment Protection of the Nile Basin (TECCONILE), and the Agreement of July 1, 1993 between Egypt and Ethiopia Establishing a Framework for Cooperation in the Utilization of the Waters of the Nile River. Agreement of July 1, 1993 between Egypt and Ethiopia, Survey of World Broadcasts, ME/1731, A/4, of 3 July, 1993, [hereinafter 1993 Nile Waters Agreement].

³⁵ See generally Bondi D. Ogolla, *Water Pollution Control in Africa: A Comparative Study*, 33 J.A.L. 149 (1989).

³⁶ Caponera, *supra* note 18, at 657-59; 1959 Nile Waters Agreement, *supra* note 28. The 1993 Agreement between Egypt and Ethiopia was negotiated because Ethiopia was not a party to the 1959 Nile Waters Agreement. However, the existence of this agreement is difficult to reconcile with the 1959 Nile Waters Agreement, which took into account full utilization of the Nile water solely between Egypt and Sudan and failed to recognize the legitimate rights of any other riparian. 1993 Nile Waters Agreement, *supra*.

³⁷ Caponera, *supra* note 18, at 657-59. See also Jacobs, *supra* note 24, at 105-14.

³⁸ Caponera, *supra* note 18, at 659. Almost all past Agreements concerning water allocation recognized Egypt's "historical" rights. *Id.*; see also Jacobs, *supra* note 24. Also drafted during British rule, the Exchange of Notes between the United Kingdom and Egypt read in part: "no irrigation or power works or measures are to be constructed or taken on the Nile. . .so far as all of these are in Sudan. . .which would, in such a manner as to entail any prejudice to interests of

Even after British rule ended, Egypt continued to assert a claim of "superior" or "historical" rights to the Nile.³⁹ By reaffirming its prior use and previously established rights, Egypt has claimed priority over future uses.⁴⁰ Moreover, as the 1959 Nile Waters Agreement demonstrates,⁴¹ Egypt has claimed not only that other states may not use the river in any way harmful to Egypt, but also that the Nile does not belong to the others to use.⁴² This Agreement provides for use of the Nile only by Egypt and Sudan, sets Egypt's claimed historical use at 55 billion cubic meters, and neglects to reserve any share for the upstream riparians.⁴³ Egypt's assertion of its historical rights contradicts the accepted water rights doctrine of equitable utilization,⁴⁴ which requires that all states' claims be considered equally.⁴⁵

Beyond merely asserting a historical right to the Nile, Egypt's economic power enabled it to enforce its historical rights. For the last 30 years, Egypt has been the dominant economic power of the Nile basin, with a per capita gross national product two times that of Sudan and five times that of Ethiopia.⁴⁶ This position enabled Egypt to dictate many terms with respect to the Nile waters and forge ahead with water projects of its own.⁴⁷ Specifically, Egypt has attempted and succeeded in using its superior political position internationally to block financing of Ethiopia's water projects.⁴⁸ Also, Egypt has stood by its "historical claim" to the Nile waters and demanded adherence to the "no harm" rule.⁴⁹ At first glance it appears that Egypt's stance may

Egypt, either reduce the quantity of water arriving in Egypt or modify the date of its arrival, or lower its level." See Exchange of Notes between the United Kingdom and Egypt, 93 L.N.T.S. 46 (1930). This agreement ultimately preserved Egypt's traditional and historic uses, as well as its status as the primary riparian. *Id.*

³⁹ Jacobs, *supra* note 24, at 109. Even while under the rule of Great Britain, Egypt was accustomed to using the Nile as it desired, and has since considered others' needs as a second tier consideration. *Id.* at 106-09. After British colonial rule ended, Sudan and Egypt argued over their rights and use of the Nile. *Id.* at 110-11. In the 1959 Nile Waters Agreement, Sudan finally recognized Egypt's "historical" rights, agreeing that the amount of the Nile water used by Egypt before the signing of this agreement would be Egypt's acquired right. *Id.* at 110-11.

⁴⁰ See *id.* at 111-12.

⁴¹ 1959 Nile Water Agreement, *supra* note 28.

⁴² *Id.* at 110.

⁴³ *Id.*

⁴⁴ Jacobs, *supra* note 24, at 99.

⁴⁵ *Id.* While this does not mean that all basin states get an equal share of the Nile water, it does mean that each country's claim is given equal weight. *Id.*

⁴⁶ Caponera, *supra* note 18, at 656.

⁴⁷ *Id.*

⁴⁸ Joseph W. Dellapenna, *Rivers as Legal Structures: The Examples of the Jordan and the Nile*, 36 NAT. RESOURCES J. 217, 247 (1996).

⁴⁹ *Id.*

be successful because Egypt draws from the Nile as much as 71 billion cubic meters of water per year, 16 billion cubic meters more than its allocation under the 1959 Nile Waters Agreement.⁵⁰

Second, a comprehensive agreement has been difficult to accomplish because attempts to organize cooperative efforts have failed as a result of existing cultural and religious differences have exacerbated tensions between the basin states.⁵¹ In 1981, Egypt and Sudan attempted, without success, to organize a committee that would observe Nile activity and encourage increased cooperation among the entire Nile basin states.⁵² Yearly meetings have been held with representatives from Egypt, Sudan, Zaire, Tanzania, Burundi, Rwanda, and Uganda.⁵³ But beyond holding meetings, this committee has no official authority and has not done much.⁵⁴ These meetings underscore the fact that differences in ethnicity, language, culture, and religion have obstructed efforts to negotiate water sharing agreements.⁵⁵ "Accusations pass back and forth as to the attempts of various religious and ethnic factions and their financial and military backers to overthrow the governments of neighboring states."⁵⁶ However, the majority of these nations do share one belief; they have little regard for the existing Nile Agreements because most of these states are not parties to these treaties, and previously had no voice in water sharing negotiations.

The long term failure to include all the basin states in an agreement appears to be ending because of the current state of the region. The Middle East is currently the region suffering the most severe water shortage in the world.⁵⁷ For instance, the population of the Middle East has available less water per capita than any other large region on the planet.⁵⁸ The population of some of the basin states has been growing at alarming rates, increasing not only the demand for water but the pollution of water resources.⁵⁹ Reports provide that in

⁵⁰ Susan Aschoff, *Cooperative Conservation Series: Discovery*, ST. PETERSBURG TIMES, Apr. 16, 1996, available in LEXIS, NEWS Library, STPETE File.

⁵¹ Jacobs, *supra* note 24, at 115-18.

⁵² ROBERT O. COLLINS, *THE WATERS OF THE NILE* 289-92 (1990).

⁵³ Jacobs, *supra* note 24, at 115. Kenya and Ethiopia had originally declined to participate, but have occasionally taken part in some sessions. *Id.*

⁵⁴ *Id.*

⁵⁵ *Id.* at 118.

⁵⁶ *Id.*

⁵⁷ Dellapenna, *supra* note 48, at 219.

⁵⁸ *Id.*

⁵⁹ Caponera, *supra* note 18, at 655-56. The Nile is increasingly affected by higher levels of pollution caused by excessive and improper use. ME Exec Reps, August 1993, *supra* note 3, at 8.

1987, there were approximately 117 million people in Egypt, Sudan, and Ethiopia.⁶⁰ By the year 2000, the population in these countries will be between 160 and 170 million people.⁶¹ Moreover, [Egypt's current dependency on the Nile water, coupled with increasing use of the river by upper riparians, underscores its need to reach a joint agreement which addresses both water pollution and water sharing concerns]. Egypt obtains 97% of its water supply from the Nile.⁶² Thus, while Egypt's population is expected to increase by 25 million people from its 1990 population estimates, its supply of the Nile water is expected to drop as drought conditions persist and as upper riparians continue to divert and pollute the waters.⁶³

Also, many of the basin states located at the headwaters of the Nile have only become independent since 1959.⁶⁴ These countries have just recently undertaken to develop their economies through exploiting the Nile waters.⁶⁵ Ethiopia and other upper riparians which have not substantially used the Nile waters in the past now intend to reserve a share of the water for future hydraulic projects within their territories.⁶⁶ These states that are not parties to the existing Nile agreements are now making decisions concerning investments in water projects and irrigation schemes that will affect the lower riparians.⁶⁷ Ethiopia in particular has announced various plans for future water projects that will undoubtedly affect the flow of the Nile water.⁶⁸ The interests of the other upper riparians, such as Burundi, Kenya, Rwanda, Tanzania, Uganda, and Zaire mainly concern power production and the control of floods.⁶⁹ However, to date, these upstream riparians are not making any significant use of the Nile waters,

⁶⁰ Caponera, *supra* note 18, at 655.

⁶¹ *Id.* at 655.

⁶² LeRoy, *supra* note 13, at 312.

⁶³ Kukk and Deese, *supra* note 18, at 42. In 1984 the river's water level dropped to the lowest level in over a century, from the 55.5 BCMs normally allocated to Egypt to 38 BCMs. *Id.* Irrigation projects and other uses of the river by upper riparians continue to diminish the amount of water reaching Egypt. SURVEY OF WORLD BROADCASTS, ME/1731, A/4, JULY 3, 1993; Caponera, *supra* note 18, at 654. Moreover, Ethiopia has made plans for projects to utilize the waters of the Blue Nile, such as the Tana Beles irrigation project, which would divert the water of Lake Tana into the valley of the Belles, and the Owen Falls Dam in Uganda, which was completed in 1954. *Id.* Also, there are plans for reclamation plants, storage reservoirs, and diversion canals similar to those used to divert water from Bahr-el-Ghazal to the White Nile and from Machar through Adar to the White Nile. *Id.*

⁶⁴ Dellapenna, *supra* note 48, at 242.

⁶⁵ *Id.*

⁶⁶ Caponera, *supra* note 18, at 665.

⁶⁷ *Id.*

⁶⁸ *See id.* at 661.

⁶⁹ *Id.* at 662.

nor are their views concerning water allocation openly known.⁷⁰ Thus, as the farthest downstream of any of the Nile basin states, Egypt is therefore vulnerable to unilateral withdrawals of water by the upstream riparians outside the framework of its current agreements.⁷¹

Therefore, increases in the population of the basin states coupled with the rising pollution and diversion of the Nile waters have introduced an immediate need for agreement in the region. The Nile basin states are faced with a potentially grave and devastating situation, and as a result are ripe for negotiations and adherence to international treaties.

2. Failures to Provide a Pollution Prevention and Control Framework

The second problem with the existing agreements is that they make little or no mention of pollution problems. Rather, the agreements address limited rights to use and navigate the river and to undertake construction of hydraulic works along the river.⁷² This lack of attention to regulating and controlling pollution reflects the policies of the Nile basin states toward pollution both within their own boundaries and with respect to the Nile.

The Nile basin states have had to balance their pursuit of economic development with the need to protect the Nile from pollution caused by industrialization.⁷³ By placing the emphasis on industrialization, the basin states have undercut state or private accountability for pollution.⁷⁴ In many of the Nile basin states the state itself owns, either completely or in large part, the industrial projects that are a major source of pollution.⁷⁵ However, the basin states have failed to impose regulations on state-owned industries because they found in-

⁷⁰ *Id.*

⁷¹ *Id.* at 660.

⁷² Caponera, *supra* note 18, at 656.

⁷³ Paul R. Williams, *Can International Legal Principles Play a Positive Role in Resolving Central and East European Transboundary Environmental Disputes?*, 7 GEO. INT'L ENV'T'L L. REV. 421, 428-29 (1995). "Economic factors are those which influence the balance between industrial protection and environmental preservation. . . ." *Id.*

⁷⁴ See generally Ogalla, *supra* note 35; See Ahmed Shawky, *The State Accountability for Harmful Impacts on Health Caused by Industrial Pollution in Egypt*, THIRD WORLD LEGAL STUDIES 135, 149 (1993). "The liability of the state in this respect may be based on the failure of the administration to take administrative control measures. . . ." *Id.* (It is well established that pollution from industrial projects causes harm to the public health). See *id.*

⁷⁵ *Id.* at 143.

dustrial development to be more crucial to their countries.⁷⁶ The basin states have also failed to regulate and enforce pollution standards on private industries.⁷⁷ Ironically, the industries that enjoyed lax regulation in the past are the same ones now finding the shortage of water along the Nile counter-productive.⁷⁸ Alarming statistics on health ailments, the falling water level of the Nile each year, and the river's highly polluted condition, have finally attracted the attention of the basin states. Moreover, today, states must not only address pollution problems within their own borders but must also seek to protect neighboring states. As the pollution problem increases, states will be more receptive to protecting the environment both inside and outside their own boundaries.

As a result of the pollution of the Nile, the amount of water allocated by the agreements does not reflect the actual amount of water available to the states.⁷⁹ Countries like Egypt are unable to use the allocated amount without extensive treatment of the water because it is so highly polluted.⁸⁰ Thus Egypt, which has resisted sharing the Nile in the past, now has much to gain from increased cooperation.⁸¹

II. EXISTING INTERNATIONAL WATER LAW PRINCIPLES

A. Territorial Sovereignty

The evolution of international environmental law, and in particular, international water law has recently been the subject of much analysis and debate. Originally, customary international law established that utilization of an international watercourse within a basin state boundary was an expression of the state's sovereignty over its natural resources.⁸² Thus, no international law prevents a state from exercising its legitimate right over its resources.⁸³ Also known as the Harmon Doctrine,⁸⁴ this theory of absolute territorial sovereignty has

⁷⁶ *Id.* "No rules have been issued in Egypt to identify administrative liability for protection of public health from industrial pollution, and no established views have been defined by the Egyptian judiciary in this respect." *Id.* at 151.

⁷⁷ See generally Ogalla, *supra* note 35.

⁷⁸ Caponera, *supra* note 18, at 653.

⁷⁹ See ME Exec Reps, August 1993, *supra* note 3.

⁸⁰ *Id.*

⁸¹ Caponera, *supra* note 18, at 660.

⁸² Michael D. Hodges, *The Rights and Responsibilities of Using an International Waterway*, 4 J. INT'L L. & PRAC. 375, 376 (1995).

⁸³ *Id.*

⁸⁴ U.S. DEPT. OF JUSTICE, 21 OFFICIAL OPINIONS OF THE ATTORNEY-GENERAL 274 (1895). [Hereinafter Dept of Justice.] Attorney General Harmon outlined his opinion to the United States Secretary of State regarding the Rio Grande in 1895. *Id.* The United States has since

been favored by upper riparians; the theory gives an upper riparian state the right to use a river in whatever manner it desires and to adopt all uses suitable to its interests without considering the impact on other states of transboundary waters.⁸⁵ Therefore, a state claiming absolute territorial sovereignty over an international water basin would incur no liability or obligation to other states for its use.⁸⁶

The idea that environmental regulation stops at state borders has become impractical in the modern framework of environmental water law, especially when the potential scope for harm and damage from domestic actions extends far beyond that of the state boundary.⁸⁷ For this reason, domestic courts, international courts, and international legal instruments have accepted the principle of limited, rather than absolute, territorial sovereignty.⁸⁸ The theory of limited territorial sovereignty has its origin in the principle *sic utere tuo ut alienum non*

rejected the Harmon doctrine. Kevin P. Scanlan, *The International Law Commission's First Ten Draft Articles on the Law of Non-Navigational Uses of International Watercourses: Do They Adequately Address all the Major Issues of Water Usage in the Middle East?*, 19 FORDHAM INT'L L.J. 2180, 2207-08 (1996).

⁸⁵ DEPT. OF JUSTICE, *supra* note 84.

⁸⁶ *Id.*

⁸⁷ *Sudan Economy*, INTERNATIONAL COUNTRY RISK GUIDE - MIDDLE EAST & NORTH AFRICA, JULY 1, 1995, at 1550. "Because both pollution and ecosystems cross state lines, a patchwork of national environmental regulations is ineffective and inefficient." *Id.* The EEAA identified 42 companies they consider "black spots," or polluted areas, which were located along the Nile river and which dumped pollutants into the Nile. EEAA is working with the companies to clean up their effluent. See also *Environmental Affairs Agency Targets Seven Industries to Clean Effluent*, INT'L ENV'T DAILY (BNA), Aug. 31, 1993, available in LEXIS, ENVIRN Library, BNAIED File [hereinafter Environmental Agency, BNA Daily].

⁸⁸ See International Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, Dec. 29, 1972, 26 U.S.T. 2403, 2406, 1046 U.N.T.S. 120, (1973). The Convention states that nations have:

"...[T]he sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction."

See also *Stockholm Declaration of the United Nations Conference on the Human Environment*, June 5-16, 1972, U.N. Doc. A/CONF.48/14/Rev. at 3 (1973), U.N. Doc. A/CONF.48/14 at 2-65, and Corr. 1 (1972), 11 I.L.M. 1416 (1972) [hereinafter *Stockholm Declaration*]. The Italian Court of Cassation has held with respect to the River Roja that "international law recognizes the right on the part of every riparian state to enjoy, as a participant in a kind of partnership created by the river, all the advantages derived from it for the purposes of securing the welfare and the economic and civil progress of the nation. . . . However, . . . it cannot disregard the international duty derived from that principle, not to impede or to destroy as a result of its regime, the opportunity of the other states to avail themselves of the flow of water for their own personal needs." *Société Énergie Électrique du Littoral Méditerranéen v. Compagnia Imprese Electriche Liguri*, 47 Ann. Dig. 120, 121 (Cass. 1938-1940)(Italy). Similarly, in the Lake Lanoux Arbitration, Spain unsuccessfully objected to a French hydroelectric power plant because it would alter the flow of a river crossing into Spain. *Lake Lanoux Arbitration (Spain v. Fr.)*, 12 U.N.R.I.A.A. 281 (1957). Notwithstanding its holding for France, the upper riparian state, the Permanent Court of Justice

laedus (use your property and perform your activities without damage to others).⁸⁹ The theory allows states to use resources within their territory as they like so long as such use does not harm the interests of other states.⁹⁰ The theory thus abandons the Harmon doctrine and absolute territorial sovereignty.

However, states are fearful of relinquishing their absolute territorial sovereignty claim. States tend to aggressively defend their sovereignty when entering agreements because they weigh their physical integrity and continued existence as important elements of their foreign policy.⁹¹ Thus, even a state that is completely satisfied with the proposed agreement is less likely to assent to it if it must sacrifice a great deal of its sovereignty.⁹² Therefore, they often opt to negotiate bilateral treaties with another state where they can negotiate terms with specificity, and create specific obligations, rather than approve treaties that accept international principles articulated in conventions or other sources of international law.⁹³

B. Codification of Theories of International Water Law

Laws and principles concerning international water law have yet to be clearly defined or firmly established.⁹⁴ There are four identifiable competing theories of international water law.⁹⁵ First, the theory of absolute territorial sovereignty allows a state to do as it pleases with the water within its territory and without considering the effect of its conduct on neighboring states.⁹⁶ Second, the absolute principle of territorial integrity and sovereign equality, also called "riparian rights," requires that water must be allowed to flow downstream substantially unchanged in quality and quantity.⁹⁷ Downstream states are thus able to object and veto any major utilization of the water by up-

also endorsed the principle of limited territorial sovereignty. It held that states undertaking work on an international waterway should take into account interests of other states. *Id.*

⁸⁹ Jacobs, *supra* note 24, at 99.

⁹⁰ Charles B. Bourne, Fresh Water as a Scarce Resource, Remarks at a Panel Discussion at the Canadian Council on International Law Conference, (October 1989) (TRANSCRIPT AVAILABLE).

⁹¹ See K. WALTZ, *THEORY OF INTERNATIONAL POLITICS* 91 (1979).

⁹² See *Developments in the Law, - International Environmental Law*, 104 HARV. L. REV. 1484, 1553 (1991) [hereinafter *Developments in the Law*].

⁹³ *Id.*; Hodges, *supra* note 82, at 381.

⁹⁴ Modern international water law centers around terms such as "reasonableness" and "appreciable harm" which do not provide a rigid framework for analysis, but require constant interpretation and analysis.

⁹⁵ Bourne, *supra* note 90.

⁹⁶ *Id.*

⁹⁷ *Id.*

stream states. Third, the restrictive theory of territorial sovereignty and integrity, also called "prior appropriation," gives the first utilization priority.⁹⁸ Hence, existing uses must not be affected by subsequent developments. Finally, the theory of "equitable utilization"⁹⁹ is the prevalent one in international water law today. The principle of equitable utilization conflicts at times with another accepted principle, that of "no harm."¹⁰⁰ For instance, equitable utilization requires a balancing of factors relevant to determining whether a suggested use is reasonable and equitable.¹⁰¹ However, the no harm rule precludes uses that result in a significant, substantial, or appreciable threshold level of harm.¹⁰² Thus, while equitable utilization might permit significant harm as a result of concluding a use to be equitable and reasonable, the no harm principle would not.¹⁰³

The International Court of Justice can impose a particular theory of water use on disputing parties in accordance with international law.¹⁰⁴ However, because the Court lacks compulsory jurisdiction, it only has jurisdiction over international river disputes when the parties agree to the court's jurisdiction.¹⁰⁵ Therefore, it is up to the states to include in their negotiated agreements the principle by which they will abide.

Three guiding authorities of international river basins are the Helsinki Rules, the Law of Non-Navigational Uses of International Watercourses, and the Third Restatement Concerning Foreign Relations. While each contains many of the developed principles of modern day water law, they provide only a framework, and leave much to be negotiated by the basin states.

⁹⁸ *Id.*

⁹⁹ See Richard K. Paisley & Timothy L. McDaniels, *International Water Law, Acceptable Pollution Risk and the Tatshenshini River*, 35 NAT. RESOURCES J. 111 (1995).

¹⁰⁰ Patricia K. Wouters, *An Assessment of Recent Developments in International Watercourse Law Through the Prism of the Substantive Rules Governing Use Allocation*, 36 NAT. RESOURCES J. 417, 419-20 (1996).

¹⁰¹ *Id.* at 419.

¹⁰² *Id.* at 419-20.

¹⁰³ *Id.* at 420.

¹⁰⁴ See Statute of the International Court of Justice, Oct. 24, 1945, art. 38(1), 59 Stat. 1031, T.S. No. 993 [hereinafter Statute of the ICJ]. The Statute provides that:

The Court, whose function is to decide in accordance with international law such disputes as are submitted to it, shall apply (a) international conventions, whether general or particular, establishing rules expressly recognized by the contesting states; (b) international custom, as evidence of a general practice accepted as law; (c) the general principles of law recognized by civilized nations; and (d) subject to the provisions of Article 59, judicial decisions and the teachings of the most qualified publicists of the various nations, as subsidiary means for the determination of the rules of law.

¹⁰⁵ See *id.* at art. 36.

1. *Equitable Utilization and the Helsinki Rules*

The 1966 Helsinki Rules on the Uses of the Waters of International Rivers (Helsinki Rules), published by the International Law Association (ILA), was the first comprehensive expression of international river basin principles.¹⁰⁶ The Helsinki Rules begin by providing a definition of an international drainage basin as "a geographical area extending over two or more states determined by the watershed limits of the system of waters, including surface and underground waters, flowing into a common terminus."¹⁰⁷

Until the codification of the Helsinki Rules there existed various theories and principles concerning the use of international watercourses. The Helsinki Rules adopted the fourth theory of international water law, equitable utilization,¹⁰⁸ which has received the most attention in the international arena. The theory of equitable utilization permits each watercourse state¹⁰⁹ to utilize an international watercourse within its territory in an "equitable and reasonable matter," as long as it takes into consideration the legitimate rights and interests of all other users.¹¹⁰ Thus, equitable utilization does not require that each basin state receive an equal share of the river water,¹¹¹ but only that the needs of each state be considered on an equal basis with the needs of other watercourse states.¹¹² This principle assigns to each user the duty to consider harm to other states and cooperate in the watercourse's protection and development.¹¹³ Equitable utilization is only effective when the states agree to work together to gather and

¹⁰⁶ Jacobs, *supra* note 24, at 100-01. However, the Helsinki Rules are not an international treaty, since they do not represent particular states' agreements, but are a statement of principles that can be adopted by states if they desire. *Id.*

¹⁰⁷ *Report of the Fifty-Second Conference: Helsinki Rules on the Uses of Waters of International Rivers*, August 20, 1966, 52 I.L.A. 484-85 (1967) [hereinafter Helsinki Rules].

¹⁰⁸ *Id.* Article IV of the Helsinki Rules states that equitable utilization entitles each basin state, within its territory, to a reasonable and equitable share in the beneficial uses of the waters of an international drainage basin. *Id.* at art. IV.

¹⁰⁹ A watercourse is a system of surface and underground waters constituting by virtue of their physical relationship a unitary whole and flowing into a common terminus. *Draft Articles on the Law of Navigational Uses of International Watercourses, Report of International Law Commission on the Work of its Forty-Third Session*, art. 2(b), U.N. GAOR, 43rd Sess., Supp. No. 10 at 161, U.N. Doc A/46/10 (1991) [hereinafter *UN ILC Forty-Third Session*]. An international watercourse is a watercourse, parts of which are located in different states. *Id.* at art. 2(a). A Watercourse State is a State in whose territory part of an international watercourse is situated. *Id.* at art. 2(c).

¹¹⁰ See BONAYA A. GODANA, *AFRICA'S SHARED WATER RESOURCES: LEGAL AND INSTITUTIONAL ASPECTS OF THE NILE, NIGER AND SENEGAL RIVER SYSTEMS* 50 (1985).

¹¹¹ Jacobs, *supra* note 24, at 99.

¹¹² *Id.*

¹¹³ *Id.*

share data concerning the amount of water supplied and demanded in the river basin that runs through their territory.¹¹⁴

The Helsinki Rules enumerate factors relevant in employing the "reasonableness" test to determine a reasonable and equitable utilization of a water resource.¹¹⁵ However, the theory merely enumerates a non-exclusive list of factors which are to be used to determine what reasonable use means;¹¹⁶ the Rules do not give preference to one reasonable use over another.¹¹⁷ The weight to be given to each factor is to be determined by its importance in comparison with that of the other relevant factors. For instance, the Helsinki Rules do not prefer an industrial use of the watercourse over an agricultural use.¹¹⁸ Thus, what is a reasonable water use to one country may be unreasonable or uncompelling to another.

Practically speaking, two factors appear to dominate the analysis: human conditions take priority over natural properties, and past and present uses take priority over potential equitable utilization.¹¹⁹ However, each state may value different factors more or less than another

¹¹⁴ U.N. SECRETARIAT, Department of Technical Cooperation for Development, Legal and Institutional Aspects of River Basin Development, in Natural Resources Water Series No. 20: River and Lake Basin Development at 138, U.N. Doc. ST/TCD/13, U.N. Sales No. E.90.II.A.10 (1988).

¹¹⁵ Helsinki Rules, *supra* note 107, at art. V.

Article V.

(1) What is a reasonable and equitable share within the meaning of Article IV is to be determined in the light of all the relevant factors in each particular case.

(2) Relevant factors which are to be considered include, but are not limited to:

- (a) the geography of the basin, including in particular the extent of the drainage area in the territory of each basin state;
- (b) the hydrology of the basin, including in particular the contribution of water by each basin state;
- (c) the climate affecting the basin;
- (d) the past utilization of the waters of the basin, including in particular existing utilization;
- (e) the economic and social needs of each basin state;
- (f) the population dependent on the waters of the basin in each basin state;
- (g) the comparative costs of alternative means of satisfying the economic and social needs of each basin state;
- (h) the availability of other sources;
- (i) the avoidance of unnecessary waste in the utilization of waters in the basin;
- (j) the practicability of compensation to one or more of the co-basin states as a means of adjusting conflicts among uses; and
- (k) the degree to which the needs of a basin state may be satisfied, without causing substantial injury to a co-basin state.

Id.

¹¹⁶ *Id.* at art. V(2).

¹¹⁷ *See id.* at art. V.

¹¹⁸ Helsinki Rules, *supra* note 107, at art. V; Niva Telerant, *Riparian Rights Under International Law: A Study of the Israeli-Jordanian Peace Treaty*, 18 LOY. L.A. INT'L & COMP. L.J. 175, 186 (1995).

¹¹⁹ Telerant, *supra* note 118.

state. The Helsinki Rules do not dictate the priority of one factor. Accordingly, all the factors are considered together and a conclusion is reached on the basis of all the factors.

However, these rules are limited in application because they do not constitute a treaty,¹²⁰ approved and signed by any particular countries; nor are they an international convention. The Rules do not bind a state unless it has adopted them, and river basin states are not required to do so.¹²¹ In practice, the Nile basin states appear to adhere to principles and create treaties that are in conflict with many of the Helsinki principles.¹²²

2. Current Doctrine: Non-Navigational Uses of International Watercourses

Prior to the 1970s, international water law was developed by the ILA. However, in the 1970's the International Law Commission (ILC) entered the field, by placing on its Agenda the law on "Non-Navigational Uses of International Water Courses."¹²³ From then on, the ILC became involved in developing international water law.

The Commission examined existing sources of watercourse law,¹²⁴ and concluded that significant support existed for the principle of equitable utilization, and that it had in fact been the governing rule of law for dealings concerning international watercourses.¹²⁵ The Commission considered two schools of thought concerning the role of equitable utilization in water law. The first suggested that equitable utilization should be expanded by adopting a "no appreciable pollution harm" rule that was not qualified by the principle of equitable and reasonable use.¹²⁶ The second opposed the idea that water uses that caused appreciable pollution harm to other watercourse states

¹²⁰ Jacobs, *supra* note 24, at 101. A treaty is "an international agreement concluded between states in written form and governed by international law." Vienna Convention on the Law of Treaties, May 23, 1969, art. 2(1)(a), 1155 U.N.T.S. 331, 8 I.L.M. 679.

¹²¹ See Jacobs, *supra* note 24, at 100-01.

¹²² *Id.* at 101. The 1959 Nile Waters Agreement, *supra* note 28, provides for full utilization of the Nile waters, allocates 55.5 BCM of water to Egypt and 18.5 BCM to Sudan, and does not reserve any share for the upstream riparians. Caponera, *supra* note 18, at 659.

¹²³ Jacobs, *supra* note 24, at 103. See *Report of the International Law Commission on the Work of Its Thirty-Ninth Session: The Law of the Non-Navigational Uses of International Water Courses*, U.N. Doc. A/42/10 (1987) [hereinafter *UN ILC Thirty-Ninth Session*].

¹²⁴ Robert Rosenstock, *First Report on the Law of Non-Navigational Uses of International Watercourses*, at 3, U.N. Doc. A/Cn.4/451 (1993) [hereinafter 1993 Report]. The Commission examined a range of sources from customary law to state practice and restatements of law. *Id.*

¹²⁵ UN ILC Thirty-Ninth Session, *supra* note 123 at 73-74.

¹²⁶ C. Stephen McCaffrey, *Fourth Report on the Law of the Non-Navigational Uses of International Watercourses* at 14, UN Doc. A/CN.4/412/Add.2 (1988); see also C. Stephen McCaffrey,

were per se inequitable and unreasonable.¹²⁷ During the 1993 ILC session, a third school of thought arose that reflected a middle course. This school suggested that equitable and reasonable use should be subordinated when harm is detected, unless a clear showing of extraordinary circumstances was made to prevent appreciable pollution harm.¹²⁸

Finally, after two decades of work on this topic and various drafts, the ILC adopted a final draft in 1994 relating to the law governing non-navigational uses of international watercourses (Draft Articles).¹²⁹ For the most part, the Draft Articles do not stray from the original principles it set forth in previous drafts.¹³⁰ The ILC's Draft Articles comprise thirty-three articles, supplemented by a resolution on transboundary ground water.¹³¹ Part II of the Draft Articles encompasses the general principles of watercourse law, including that of equitable utilization, presented in the Helsinki Rules.¹³²

However, the Commission's work is not a complete adoption of the Helsinki Rules' principles. Specifically, the Draft Articles differ

The Law of International Watercourses: Some Recent Developments and Unanswered Questions, 17 DENV. J. INT'L L. POL'Y 505, 510 (1989).

¹²⁷ Bourne, *supra* note 90.

¹²⁸ *Report of the International Law Commission on the Work of Its Forty-Sixth Session: The Law of the Non-Navigational Uses of International Water Courses*, U.N. GAOR 6th Comm., 49th Sess., Supp. No. 10, at 207, U.N. Doc. A/49/10 (1994) [hereinafter Draft Articles], articulated a middle course as follows:

Watercourse states shall exercise due diligence to utilize and international watercourse in such a way as not to cause significant harm to the other watercourse states, absent their agreement, except as may be allowable under an equitable and reasonable use of the watercourse. A use which causes significant harm in the form of pollution shall be presumed to be an inequitable and unreasonable use unless there is: (a) a clear showing of special circumstances indicating a compelling need for an ad hoc adjustment; and (b) the absence of any imminent threat to human health and safety.

¹²⁹ Draft Articles, *supra* note 128. The Draft Articles are being considered by the United Nations General Assembly.

¹³⁰ *Id.*

¹³¹ *Id.* Wouters, *supra* note 100, at 421.

¹³² Draft Articles, *supra* note 128, at art. 5-10; Articles 6 and 7 of the Draft Articles demonstrate the influence of the Helsinki Rules on the international watercourse principles found in the Draft Articles. See Helsinki Rules, *supra* note 107, at arts. VI, VII.

Article 6. Equitable and Reasonable Utilization and Participation

1. Watercourse states shall in their respective territories utilize an international watercourse system in an equitable and reasonable manner. In particular, an international watercourse system shall be used and developed by watercourse States with a view to attaining optimum utilization thereof and benefits therefrom consistent with adequate protection of the international watercourse system.

2. Watercourse states shall participate in the use, development and protection of an international watercourse system in an equitable and reasonable manner. Such participation includes both the right to utilize the international watercourse system as provided in paragraph 1 of this article and the duty to co-operate in the protection and development thereof. . .

Draft Articles, *supra* note 128, at art. 6-7.

from their ILA counterpart in three respects.¹³³ First, the ILA analyzes past and present uses, while the Draft Articles consider present and future uses.¹³⁴ Second, the ILA's Helsinki Rules function solely on the principle of equitable utilization, whereas the Draft Articles encompass the principle of equitable utilization, as well as the concept of no harm.¹³⁵ Third, the Draft Articles preference certain factors in evaluating harm, where the Helsinki Rules treat all factors equally.¹³⁶

The ILC intended the Draft Articles to supply states with a general framework, within which they would provide the specifics through negotiations.¹³⁷ To serve as a framework, the Draft Articles articulated states' general duties and obligations. This general framework was also intended to ensure global approval of the Draft Articles by the various states.¹³⁸ Specifically, the Draft Articles' adoption of the equitable utilization principle will garner additional global support because many experts consider equitable utilization to be sufficiently flexible to accommodate the unique aspects of a watercourse.¹³⁹

3. *Text of the Draft Articles*

a. *Equitable Utilization and Harm*

Article 5 of the Draft Articles requires that a state utilize a watercourse in an equitable and reasonable manner.¹⁴⁰ "By balancing the

¹³³ Telerant, *supra* note 118, at 188.

¹³⁴ See Draft Articles, *supra* note 128, at art. 6(d); see Helsinki Rules, *supra* note 107, at art. V(d).

¹³⁵ Helsinki Rules, *supra* note 107, at art. IV, Draft Articles, *supra* note 128, at arts. 5; 7.

¹³⁶ Helsinki Rules, *supra* note 107, at art. V; Draft Articles, *supra* note 128, at art. 6.

¹³⁷ 1993 Report, *supra* note 124. Special Rapporteur Robert Rosenstock argued that the concept of a framework agreement will best solve the problems surrounding the uses of international watercourses by providing:

[F]or the States parties the general principles and rules governing the non-navigational uses of international watercourses, in the absence of specific agreement among the states concerned, and provide guidelines for the negotiations of future agreements. This approach recognizes that the optimal utilization, protection and development of a specific international watercourse is best achieved through an agreement tailored to the characteristics of that watercourse and to the needs of the States concerned.

¹³⁸ Scanlan, *supra* note 84, at 2180, 2211.

¹³⁹ *Id.* at 2224.

¹⁴⁰ Draft Articles, *supra* note 128, at art. 5. Article 5 states:

1. Watercourse states shall in their respective territories utilize an international watercourse in an equitable and reasonable manner. In particular, an international watercourse shall be used and developed by watercourse States with a view to attaining optimal utilization thereof and benefits therefrom consistent with adequate protection of the watercourse.
2. Watercourse States shall participate in the use, development and protection of an international watercourse in an equitable and reasonable manner. Such participation includes the right to utilize the watercourse and the duty to co-operate in the protection and development thereof, as provided in the present articles.

Id.

benefits enjoyed and the harms incurred by [the other states], [equitable utilization] does not automatically prohibit a specific use of an international river simply because it causes some harm to another state.”¹⁴¹ If the Draft Articles did not incorporate the equitable utilization principle, one state could unilaterally “prohibit development on a watercourse by other watercourse states.”¹⁴² The Draft Articles also provide guidance on what constitutes equitable utilization of the watercourse. Specifically, Article 6 enumerates a shorter list of factors than those listed in the Helsinki Rules for determining what reasonable use means.¹⁴³ Notably, while the Helsinki Rules include substantial injury¹⁴⁴ as a factor, this provision does not include “harm or “injury” as factors to assess equitable utilization.¹⁴⁵

However, Article 7 sets forth the principle of no harm, replacing the former “no appreciable harm provision” of the 1991 draft.¹⁴⁶ According to Article 7, a use that has been found to be both equitable and reasonable under the factors set forth in Article 6 may be pre-

¹⁴¹ Scanlan, *supra* note 84, at 2224.

¹⁴² *Id.*

¹⁴³ Draft Articles, *supra* note 128, at art. 6. Article 6 states:

1. Utilization of an international watercourse in an equitable and reasonable manner within the meaning of article 5 requires taking into account all relevant factors and circumstances, including:

- (a) geographical, hydrographic, hydrological, climatic, ecological and other factors of a natural character;
- (b) the social and economic needs of the watercourse States concerned;
- (c) the population dependent on the watercourse in each watercourse State;
- (d) the effects of the use or uses of the watercourse 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 measures taken to that effect;
- (g) the availability of alternatives, of corresponding value, to a particular planned or existing use.

2. In the application of article 5 or paragraph 1 of this article, watercourse States concerned shall, when the need arises, enter into consultation in a spirit of cooperation.

Id.

¹⁴⁴ Helsinki Rules, *supra* note 107, at art. V; Wouters, *supra* note 100, at 439, n.27.

¹⁴⁵ Draft Articles, *supra* note 128, at art. 6.

¹⁴⁶ Wouters, *supra* note 100, at 422. Draft Articles, *supra* note 128, at art. 7. Article 7 states:

1. Watercourse States shall exercise due diligence to utilize an international watercourse in such a way as not to cause significant harm to other watercourse States.

2. Where, despite the exercise of due diligence, significant harm is caused to another watercourse State, the State, whose uses causes the harm shall, in the absence of agreement to such use, consult with the state suffering harm over:

- (a) the extent to which the use has proved equitable and reasonable, taking into account the factors listed in Article 6;
- (b) the question of ad hoc adjustments to its utilization, designed to eliminate or mitigate any such harm caused, and where appropriate, the question of compensation.

Id.

cluded if it causes significant harm to another watercourse state.¹⁴⁷ Article 7 requires that a watercourse state exercise “due diligence” to use a watercourse in a manner which does not cause “significant harm.”¹⁴⁸ The Commentary to Article 7 sets forth a standard for evaluating whether a state has violated its due diligence responsibility stating,

A watercourse State can be deemed to have violated its due diligence obligation only if it knew or ought to have known that the particular use of an international watercourse would cause significant harm to other watercourse States.¹⁴⁹

At first glance the due diligence standard of Article 7 is difficult to reconcile with the equitable utilization standard set forth in Article 5. The Commentary of Article 7 attempts to clarify that Article 7 “is setting forth a process aimed at avoiding significant harm as far as possible while reaching an equitable result in concrete cases.”¹⁵⁰ Thus in certain cases, the “equitable and reasonable utilization” of an international watercourse may still involve significant harm to another watercourse State” and “the principle of equitable utilization remains the guiding criterion in balancing the interests at stake.”¹⁵¹ However, paradoxically, the Commentary asserts that the obligation set forth in Article 7 “sets the threshold for lawful States activity.”¹⁵² Therefore, it is clear that the threshold determination is significant harm, and a use found to be equitable and reasonable alone will not suffice. This position is supported by the text of Article 7, as well, which reduces the principle of equitable utilization to a mere factor to be considered in analysis where significant harm has occurred.¹⁵³ Under the Draft Articles a State may develop an equitable and reasonable use only where it knows or ought to know that it would not cause significant harm to other states.¹⁵⁴ However, despite the due diligence standard, a state has little concrete obligation upon a finding that significant harm occurs. States are required only to consult over whether the use is equitable and if the harm can be mitigated or compensated.¹⁵⁵

The prevalence of the significant harm threshold can also be seen in Articles 10 and 21. Article 10 gives special weight to existing uses

¹⁴⁷ Draft Articles, *supra* note 128, at art. 7.

¹⁴⁸ *Id.*

¹⁴⁹ *Id.* at commentary to art. 7; Wouters, *supra* note 100, at 422.

¹⁵⁰ Draft Articles, *supra* note 128, at commentary to art. 7.

¹⁵¹ *Id.*; Wouters, *supra* note 100, at 423.

¹⁵² Draft Articles, *supra* note 128, at commentary to art. 7; Wouters, *supra* note 100, at 423.

¹⁵³ Draft Articles, *supra* note 128, at art. 7(2).

¹⁵⁴ *Id.* at commentary to art. 5; Wouters, *supra* note 100, at 423.

¹⁵⁵ Draft Articles, *supra* note 128, at art. 7.

where "vital human needs" are involved.¹⁵⁶ "The prescribed preferential treatment of any particular factor precludes a true application of the principle of equitable utilization and imposes a no harm approach aimed at protecting prior uses."¹⁵⁷ Likewise Article 21 contains a much more stringent prohibition against any pollution whether or not it causes significant harm within the meaning of Article 7.¹⁵⁸

b. Cooperation

The Commission also considered whether international water law should impose a duty of international cooperation.¹⁵⁹ Commission members determined that it was "unrealistic to attempt to impose a mandatory obligation on States to cooperate even though there might exist a need."¹⁶⁰ However, the Draft Articles do in fact set forth several obligations of cooperation between the watercourse states. Article 5 also sets forth the principle of equitable participation.¹⁶¹ First, watercourse states have an obligation to put forth joint efforts in the protection and development of a watercourse.¹⁶² Second, states have the right to expect the cooperation of other states in matters concerning the watercourse.¹⁶³

Article 9 sets forth a duty on behalf of the states to exchange data and information to guarantee equitable utilization of the watercourse.¹⁶⁴ However, the Draft Articles require the exchange of data

¹⁵⁶ *Id.* at 424; Draft Articles, *supra* note 128, at art. 10(2), states:

2. In the event of a conflict between uses of an international watercourse, it shall be resolved with reference to the principles and factors as set forth in articles 5 to 7, with special regard given to the requirements of vital human needs.

The Commentary to Article 10 described this consideration as "an accentuated form" of the factor (1)(b) of Article 6. Draft Articles, *supra* note 128, at commentary to art. 10.

¹⁵⁷ Wouters, *supra* note 100, at 424.

¹⁵⁸ Draft Articles, *supra* note 128, at art. 21.

¹⁵⁹ UN ILC Thirty-Ninth Session, *supra* note 123, at 41-45.

¹⁶⁰ *Id.* at 41.

¹⁶¹ Draft Articles, *supra* note 128, at art. 5.

¹⁶² *Id.*

¹⁶³ *Id.*

¹⁶⁴ *Id.* at art. 9. Article 9 states:

1. Pursuant to article B, watercourse states shall on a regular basis exchange readily available data and information on the condition of the watercourse, in particular that of a hydrological, meteorological, hydrogeological and ecological nature, as well as related forecasts.

2. If a watercourse State is requested by another watercourse State to provide data or information that is not readily available, it shall employ its best efforts to comply with the request but may condition its compliance upon payment by the requesting State of the reasonable costs of collecting and, where appropriate, processing such data or information.

3. Watercourse States shall employ their best efforts to collect, and where appropriate, to process data and information in a manner which facilitates its utilization by the watercourse States to which it is communicated.

Id.

only if readily available, and where it is not available a state need only use "best efforts."¹⁶⁵ Thus the Draft Articles intentionally avoid language that places a heavy and costly burden on states to comply.¹⁶⁶

c. Priority of Uses

The Draft Articles vary from the Helsinki Rules with respect to how each prioritizes uses of the watercourse. The Helsinki Rules analyze past and present uses, while the Draft Articles consider present and future uses. The varying priority treatment of uses can prove to be a point of significant tension with regard to the Nile basin states. Upper riparian states such as Ethiopia will likely favor a priority of future uses. Countries, such as Egypt and Sudan, who have been enjoying unfettered use of the Nile for the better part of the last century are more likely to favor a priority of past or present uses.

The Draft Articles also provide a default rule. Article 10 sets forth the principle that one use of an international watercourse may enjoy inherent priority over another use.¹⁶⁷ Under Article 10, the states are given the ability to place a specific value upon each use so long as such value is based on either agreement or custom.¹⁶⁸ If a use is determined not to have been established either by custom or agreement, then the conflict is resolved by the factors set forth in Articles 5 to 7.¹⁶⁹

4. *Restatement Principles*

Though principles embodied in the Restatement have not had the same influential value as those articulated by the ILC or the ILA,¹⁷⁰ they reflect many of the same principles, and expand on some. Specifically, "environmental harm" is not limited to pollution.¹⁷¹ However,

¹⁶⁵ *Id.*

¹⁶⁶ *Id.*

¹⁶⁷ *Id.* at art. 10. Article 10 states:

1. In the absence of agreement or custom to the contrary, no use of an international watercourse enjoys inherent priority over other uses.
2. In the event of a conflict between uses of an international watercourse, it shall be resolved with reference to the principles and factors as set forth in articles 5 to 7, with special regard given to the requirements of vital human needs.

Id.

¹⁶⁸ *Id.*

¹⁶⁹ *Id.*

¹⁷⁰ RESTATEMENT (THIRD) OF FOREIGN RELATIONS § 601 (1992) [hereinafter RES(3RD)].

¹⁷¹ *Id.* at section 601. The introductory note to section 601 states:

Environmental harm may be caused by activities other than pollution; a dam may cause erosion, or irrigation may increase the salinity of a river. Other environmental problems of international concern include the need to improve habitat and human settlements; to protect archeological treasures, cultural monuments, nature sanctuaries, endangered fauna and

like the Helsinki rules and the Draft Articles, the Restatement does not provide an operational definition for pollution, but rather, speaks in terms of "significant injury."¹⁷² Significant injury is not defined, but international law makes reference to "significant" impact.¹⁷³ The Restatement, however, recognizes that significant injury may be qualified if it is balanced by the benefits or importance of the activity of the offending state.¹⁷⁴ Again, this balancing will take into account various subjective factors and judgments.¹⁷⁵ A country may desire to assume a risk, believing that the potential benefits will far exceed any harm. However, in the eyes of another country that will reap no benefits, the risk may be significant. The Restatement mentions this idea of "significant risk" and obligates the state to take preventative measures.¹⁷⁶ Again it leaves the determination of "significant risk" to the various states.

III. CLARIFYING MODERN DOCTRINES AND FORMING A SUCCESSFUL INTERNATIONAL WATER LAW AGREEMENT

The current doctrines governing international watercourses provide only a starting point for any negotiation or international agreement. Specifically, any international water agreement must include: commitments by all the basin states to share the watercourse, an acceptance of the principle of equitable utilization qualified by a thresh-

flora, and migratory birds; to lessen the consequences of deforestation, overfishing, and weather modification.

Id.

¹⁷² *Id.* State Obligations with Respect to Environment of Other States and Common Environment

(1) A state is obligated to take such measures as may be necessary, to the extent practicable under the circumstances, to ensure that activities within its jurisdiction or control

(a) conform to generally accepted international rules and standards for the prevention, reduction, and control of injury to the environment of another state or of areas beyond the limits of national jurisdiction; and

(b) are conducted so as not to cause significant injury to the environment of another state or of areas beyond the limits of national jurisdiction.

(2) A state is responsible to all other states

(a) for any violation of its obligations under Subsection (1)(a), and

(b) for any significant injury, resulting from such violation, to the environment of areas beyond the limits of national jurisdiction. . .

Id.

¹⁷³ *Id.* at comment c. The word 'significant' excludes minor incidents causing minimal damage. *Id.*

¹⁷⁴ *Id.*

¹⁷⁵ For a discussion on the different prevailing opinions among water law experts as to the supremacy of certain uses of an international river, see B.R. CHAUHAN, SETTLEMENT OF INTERNATIONAL WATER LAW DISPUTES IN INTERNATIONAL DRAINAGE BASINS 206 (1981).

¹⁷⁶ RES(3RD), *supra* note 170.

old no harm rule, mechanisms for pollution regulation and control, and sanctions against polluters.

A. An International Watercourse Agreement Must Include All the Basin States and the Principle of "Equitable Utilization" as well as "No Harm"

Any successful international watercourse agreement must include the participation of all the basin states. The treaties will have little useful function if they do not include all the basin states. The Draft Articles recognize the need for cooperation.¹⁷⁷ The Commission requires that watercourse states "shall cooperate on the basis of sovereign equality, territorial integrity and mutual benefit in order to obtain optimum utilization and adequate protection of an international watercourse."¹⁷⁸ International watercourse principles also require that watercourse states negotiate to establish standards, regulations and definitions that will ultimately govern.¹⁷⁹ However, they are not mandatory, and cannot bind any basin state without its permission.¹⁸⁰ Nor are they universally accepted over traditional or customary law.¹⁸¹ In addition, the Draft Articles have assumed participation by all the states of the watercourse.¹⁸² However, participation has been one of the major obstacles, and it is doubtful whether an agreement that does not include all the basin states as parties is effective.

In order for these principles to be adopted, watercourse states must want to adopt them.¹⁸³ As a first step, the Nile river basin states must recognize their mutual dependence on the Nile and the need to control those polluting the Nile more aggressively.¹⁸⁴ Because problems along the Nile affect other states as well, the traditional concept of absolute territorial sovereignty cannot prevail. In fact, any legal obligation or duty that international "law imposes on states to refrain from polluting activities, or to prevent others from polluting, necessarily involves a diminution or relinquishment of territorial state

¹⁷⁷ Draft Articles, *supra* note 128, at art. 8.

¹⁷⁸ *Id.*

¹⁷⁹ See *Developments in the Law*, *supra* note 92, at 1552-54.

¹⁸⁰ *Id.*

¹⁸¹ *Id.*

¹⁸² Draft Articles, *supra* note 128, at art. 4. "Every watercourse state is entitled to participate in the negotiation. . ." *Id.*

¹⁸³ *Id.*

¹⁸⁴ James E. Hickey, Jr. & Vern R. Walker, *Refining the Precautionary Principle in International Environmental Law*, 14 VA. ENV'T L. L.J. 423 n.3, 430-31 (1995).

sovereignty because states no longer are free to deal with pollution originating inside their territory in any way they choose."¹⁸⁵

Furthermore, an agreement must adopt the principles of equitable utilization and no significant harm. Thus, the needs of each state are to be considered on an equal basis with the needs of the other states sharing the basin water. If the basin states accept this rule, then they are acknowledging the legitimate rights of all the basin states, which is a step away from the positions that they have taken for the better part of the century. In addition, any agreement must also include the principle of no significant harm as set forth in the Draft Articles.¹⁸⁶ Accordingly, a use that has been deemed to be both equitable and reasonable may and should still be prohibited if it causes significant harm to another watercourse state.¹⁸⁷ Preventative measures may be one aspect of mitigating harm to another state. However, such measures alone should not be the sole justification for proceeding with an activity if the harm remaining is still significant.

Thus, the countries must, together and acknowledging the rights of each, adopt the principle of co-operation.¹⁸⁸ This must include the abandonment of any "historical" claims or assertions of precedence, as has been typical in that region. While Egypt will undoubtedly not relinquish its claim to a "historical" right to the Nile completely, in the face of imminent disaster of dwindling water reserves and upstream pollution sources, it has more to gain than any of the other co-riparians from increased cooperation.¹⁸⁹ It is important that Egypt continue negotiations without placing preconditions like those in the 1959 treaty.

B. A Successful Agreement Must Include Pollution Management and Prevention, Not Just Water Allocation

Treaties will have little success if they do not include all the basin states. Nor will they have any use if they solely refer to water rights and water allocation. Rather, they must take into account pollution and its effect on water allocation.¹⁹⁰ The mutual goal allocating water

¹⁸⁵ *Id.*

¹⁸⁶ *Draft Articles, supra* note 128, at art. 7.

¹⁸⁷ *Id.*

¹⁸⁸ Hickey & Walker, *supra* note 184, at 440. Co-operation means in particular to study, with aims to find a solution, those environmental problems that arise and escape the boundaries of the individual states, and to adapt the mutual aim of preventing and controlling transboundary water pollution, for the improvement of the quality of the water source. *Id.*

¹⁸⁹ See *Egypt: New Nile Water Strategy Needed*, AFR. ECON. DIG. 11 (1995).

¹⁹⁰ See Ogolla, *supra* note 35.

between these basin states today must include the management of pollution along the international watercourse.¹⁹¹

1. Defining Pollution

The definition of pollution is often provided in broad terms that need to be supplemented. One definition provides that "pollution is the qualitative alteration of any medium for the worse so that long established equilibria between life systems which the medium sustains are either adversely affected or even irreparably damaged."¹⁹² According to the ILA, pollution means "any introduction by man, directly or indirectly, of substance or energy into the environment resulting in deleterious effects of such a nature as to endanger human health, harm living resources, ecosystems and material property and impair amenities or interfere with other legitimate uses of the environment."¹⁹³ The Draft Articles define pollution as "any detrimental alteration in the composition or the quality of the watercourse which results directly or indirectly from human conduct."¹⁹⁴ Each of these definitions of pollution can only function when adopted alongside a framework for determining what constitutes a "qualitative alteration," "deleterious effect," or "detrimental alteration."

Furthermore, a number of different processes can alter or affect the quality of water. These various polluting activities also need to be characterized. For instance, biological pollution stems from the discharge of sewage and other biological wastes.¹⁹⁵ Industrial pollution stems from complex chemical wastes that are dumped into a body of water causing a deterioration of water quality.¹⁹⁶ Such chemical wastes include residue carried by run-off into the water supply from the predominantly agricultural economies of Africa.¹⁹⁷ However, the most predominant pollutant waste from agricultural activities is the sediments load from croplands, overgrazed pastures, and unprotected forest soils.¹⁹⁸ Thus, because pollutants come from a variety of diverse sources, it is important to identify and regulate each separately. The Draft Articles do not indicate what should be considered a pollu-

¹⁹¹ *See id.*

¹⁹² Ogolla, *supra* note 35, at 151.

¹⁹³ *ILA Rules on International Law Applicable to Transfrontier Pollution*. Concluded at Montreal, 4 September 1982. 60 I.L.A. 158 (1983).

¹⁹⁴ *Draft Articles*, *supra* note 128.

¹⁹⁵ Ogolla, *supra* note 35, at 151.

¹⁹⁶ *Id.*

¹⁹⁷ *Id.*

¹⁹⁸ *Id.*

tant, but rather, leave it up to the conglomeration of states.¹⁹⁹ The states should attempt to identify the various polluting processes within their boundaries. It is only then that they can and should establish a list of substances that may be considered pollutants when introduced into the watercourse and that may ultimately result in a harm to the watercourse.²⁰⁰

2. *Determining Existing Harm and Injury*

Moreover, the Agreement should include a manner for determining whether a harm or injury has occurred. In Egypt, most of the industrial projects were not designed with the pollution problem in mind.²⁰¹ Therefore, their design does not include pollution control equipment.²⁰² It is estimated that Egypt alone needs two billion Egyptian pounds to provide its industrial projects with the necessary equipment.²⁰³ Any agreement must address the current instances of harm and pollution. Furthermore, any agreement must include means of addressing these practices. An effective licensing system can be a means of monitoring and controlling existing polluting practices. The licensing process would enable the governments to regulate and control the exploitation of their water resources.²⁰⁴ The licensing authority would have the power to impose conditions that address specific pollution concerns. The licensing agency would regulate any industry who seeks to abstract, divert, impound or discharge into the water source.²⁰⁵ For instance, such a system would require a license to discharge effluents by any factory or industry. However, today, most of the African countries under pollution control legislation do not require a licence for the discharge of effluents.²⁰⁶ Furthermore, requiring licenses to be renewed yearly will aid in updating and monitoring current levels of pollutants.

Any international agreement must include a provision requiring the sharing of information and data. As a starting point, this informa-

¹⁹⁹ *Draft Articles, supra* note 128. The Draft Articles state that "Watercourse States shall, at the request of any of them, consult with a view to establishing lists of substances, the introduction of which into the waters of an international watercourse is to be prohibited, limited, investigated or monitored."

²⁰⁰ *Id.*

²⁰¹ Shawky, *supra* note 74, at 142.

²⁰² *Id.*

²⁰³ *Id.*

²⁰⁴ Ogolla, *supra* note 35, at 151.

²⁰⁵ *Id.*

²⁰⁶ *Id.*

tion is useful in monitoring pollution and evaluating if harm has occurred.

However, where the basin states are developing countries, industrial development often takes precedence over long-term environmental concerns.²⁰⁷ Thus, it may be difficult for states to admit that their current actions are "harming" the water source. This further complicates the efforts made in drawing the line between one state's definition of "harm" or "injury" and another's definition of "use" and "benefit." "Harm" in the Helsinki Rules was "substantial injury," in the Draft Articles, was defined as "significant harm," and in the Restatement, harm was "significant injury." All require further analysis and definition by the states to be operable.

3. *Predicting Harm*

Finally, the agreement must provide a method for assessing future harm and thus preventing pollution and injury. Pollution, protection and the preservation of the environment are made reference to in the Draft Articles, holding that the "states shall, individually or jointly, protect and preserve the ecosystems of the international watercourses."²⁰⁸ The present doctrines require watercourse states to, either individually or together, prevent, reduce, and control pollution that may harm human life and safety, damage the watercourse, or cause significant harm to the other watercourse states.²⁰⁹ Again the terms "significant harm" and "beneficial purpose" are used without further clarification. Thus, it may be difficult to determine these factors, even though the watercourse states are expected to harmonize their policies.²¹⁰ In order to prevent pollution and preserve the ecosystem of the international watercourses, there must be a method by which states predict potential harm, analyze risk, and thus prevent it.

²⁰⁷ Shawky, *supra* note 74, at 142.

²⁰⁸ *Draft Articles, supra* note 128, at art. 20. "Article 20. Protection and Preservation of Ecosystems: Watercourse States shall, individually or jointly, protect and preserve the ecosystems of international watercourses." *Id.*

²⁰⁹ *Id.* at art 21(2).

Article 21. Prevention, reduction and control of pollution

2. Watercourse states shall, individually or jointly, prevent, reduce and control pollution of an international watercourse that may cause appreciable harm to other watercourse States or to their environment, including harm to human health or safety, to the use of the waters for any beneficial purpose or to the living resources of the watercourse. Watercourse States shall take steps to harmonize their policies in this connection.

Id.

²¹⁰ *Id.*

Current international water law is cast in terms of harm that has already occurred, rather than evaluations of future harm that may occur.²¹¹ By being unable to provide concrete standards or definitions for what constitutes harm or injury, it is difficult to develop operational indicators of future harm. As a result, phrases such as "acceptable injury"²¹² and "significant risk"²¹³ have emerged. By utilizing this standard of "acceptable" or "significant," states may take into account and accept some risk of pollution harm in exchange for other benefits, such as resource development or industrial growth. Again, this "acceptable risk" or "significant injury" of pollution harm brings into play many factors.²¹⁴ One state may consider the pollution risk acceptable, while another may find the risk of harm unacceptable and significant.²¹⁵

C. A Successful Agreement Must Include Provisions of Private Accountability

1. *Filling the Gaps of Civil Sanctions*

Any agreement between basin states must include provisions providing for and enforcing civil sanctions. In general, civil sanctions currently fall short for two reasons. First, the existence of civil sanctions is small and lack clarity.²¹⁶ This results, first, from a lack of uniformly set quality and pollution standards, either within one country or among the whole states along the Nile basin.²¹⁷ States need to adapt international water law principles and determine a workable definition of either water quality standards or effluent discharge standards.²¹⁸ Upon establishing such standards, States must design a licensing system requiring polluting entities to obtain such permits and to continually renew such permits. This allows States to monitor con-

²¹¹ *Helsinki Rules*, *supra* note 107. The Helsinki Rules suggest a reasonableness determination. However, it is difficult to evaluate a reasonable use if there is no mechanism for determining what damage may result from that use. *Id.*

²¹² See Paisley & McDaniels, *supra* note 99.

²¹³ RES(3RD), *supra* note 170.

²¹⁴ There are many standards involved in assessing acceptable risk. Some factors include the costs and benefits of alternatives. Stephen L. Derby & Ralph L. Keeney, *Risk Analysis: Understanding How Safe is Safe Enough?*, 1 RISK ANALYSIS 217 n.3 (1981). Other assessments consider people's confidence in new technology and the degree to which risks are known to science. P. Slovic, *Perception of Risk*, 236 SCIENCE 280 (1987).

²¹⁵ Paisley & McDaniels, *supra* note 99.

²¹⁶ Ogolla, *supra* note 35, at 153-55.

²¹⁷ *Id.* "[T]here is no definition of either water quality criteria or effluent discharge standards." *Id.* at 153.

²¹⁸ *Id.*

formance with established standards. It also provides a manner for states to communicate standards to industries and to require compliance. These standards need to include regulations for corporate industries, state industries, as well as non-industrial activities on the land that adversely effect the Nile water.²¹⁹ Without such a guideline for determining the existence of pollution and compliance with standards, enforcement agencies, if there are any, cannot determine if sanctions are required.²²⁰ Second, even countries with elaborate regulatory schemes need agencies with both monitoring and enforcement agencies.²²¹ There are very few agencies within the Nile basin states' national governments that assess current and potential pollution and determine any violations.²²² As a result, corporations have gone virtually unchecked.²²³ Any agreement must establish an obligation on states to monitor and enforce any promulgated standards. Thus, states must establish agencies to monitor and enforce compliance. As a result, civil sanctions fail to have any deterrent impact on the polluting corporations and have not been an effective method for pollution control.

2. *Establishing Criminal Sanctions*

Currently one of the primary tools of compliance has been the recent trend towards criminal sanctions. The debate over criminal sanctioning of corporate misconduct has attracted serious study by

²¹⁹ *Id.* Very few countries take into account and regulate non-industrial activities. *Id.*

²²⁰ *Id.* The World Health Organization pointed out in 1973 that most of the pollution problems in Kenya were a result of a lack of enforcement of existing law. In addition, within developing countries, it found that environmental management and activism were constrained by development discretionary powers vested in the enforcement agencies in the countries surveyed. *Id.*

²²¹ See Unified Environmental Law, 17 MIDDLE EAST EXECUTIVE REPORTS 10 (1994) [hereinafter Unified Environmental Law]. The EEAA's functions are summarized:

- formulate policy, prepare plans for coastal protection, hazardous waste, air pollution, land and water pollution and pollution prevention, and implement pilot projects.
- set the environmental norms and conditions to be followed during the construction of any project and the necessary norms and standards to assure compliance with permissible limits of pollutants.
- establish mechanisms for conducting environmental impact assessments, which are required for all development projects to insure compliance with environmental regulations and standards.
- establish and supervise an environmental monitoring network.
- prepare plans for environmental training, education, and public awareness.
- collect and publish environmental information and prepare an annual report of the state of the environment.

²²² The Department of Irrigation in Egypt has been assigned the task of regulating pollutants dumped into the Nile as a result of irrigation. It has been criticized on numerous occasions for failing to perform its duty.

²²³ See generally Ogolla, *supra* note 35.

many countries around the world, especially in the area of environmental pollution. Specifically, corporate misconduct has become a matter of increasing importance.²²⁴ However, the Nile basin states must adopt the implementation of criminal sanctions against those who pollute if any efforts to control pollution are to be successful.

Criminalizing the conduct of corporations and its corporate officers for violating environmental pollution standards is an effective alternative to civil sanctions that continually fall short of their set goals.²²⁵ Civil sanctions touch the corporation and its pockets; however, they do not reach to the corporate officer or manager who is responsible for running the corporation.²²⁶ Because civil sanctions do not touch the corporate officer or manager, civil sanctions are often regarded as a cost of doing business, not as a threat for compliance.²²⁷ Often the penalties are less expensive than corporate compliance with the law.²²⁸ While criminal prosecution will not always be an appropriate response,²²⁹ it may be appropriate when the offender intentionally violates standards and has failed to respond to administrative sanctions.²³⁰

Moreover, the fear of criminal prosecution will give rise to a more rigid balancing equation. Corporate officers and managers will no longer have an ambivalent view of environmental compliance and will not consider violations of environmental standards a cost of doing business.²³¹ Instead, by establishing corporate sanctions, they will view noncompliance as a crime for which they personally are held liable rather than a corporate calculation.²³²

²²⁴ See Roman Tomasic, *Sanctioning Corporate Crime and Misconduct: Beyond Draconian and Decriminalizing Solutions*, 2 AUSTRALIAN J. CORP. L. 82 n.2 (1992).

²²⁵ See Wolf, *infra* note 227.

²²⁶ *Id.* at 1. (Civil sanctions do not strike at "the corporate officer or manager whose policies and decisions guide or influence corporate environmental compliance"). *Id.*

²²⁷ Sidney M. Wolf, *Finding an Environmental Felon Under the Corporate Veil: The Responsible Corporate Officer Doctrine and RCRA*, 9 J. LAND USE & ENVTL. L. 1, n.1 (1993). Moreover, because they are aimed at the entity, they may eventually harm interests held by shareholders and consumers. *Id.*

²²⁸ *Id.* at 2.

²²⁹ See Eliane L. Hughes, *Sentencing Environmental Offenders: Objectives and Principles*, 4 J. ENVTL. L. PRAC. 185 (1994).

²³⁰ *Id.* at 186. Prosecution may be the appropriate response if the offender is "negligent; violates standards deliberately; ignores repeated warnings or requests by authorities, knows of problems but chooses to devote its resources elsewhere; violates permit terms that it originally negotiated for itself; has a previous record; has failed to respond to administrative sanctions; is deceptive, flagrant or cavalier in its attitude, or has engaged in particularly damaging misconduct." *Id.*

²³¹ Wolf, *supra* note 227, at 2.

²³² *Id.*

a. Egypt's Adoption of Criminal Sanctions

As a result of the rising threat to Egypt's population and national security, Egypt has implemented an aggressive anti-pollution program that will be administered by the Egyptian Environmental Affairs Agency (EEAA), by which corporate polluters will be held liable under criminal rather than administrative law.²³³ Egypt's environmental law is the first aggressive step the country has taken to combat pollution in the region.²³⁴ It is also the first time that Egypt has given any government entity the power to ensure that environmental provisions are designed and implemented.²³⁵ Previously, the Egyptian Environmental Affairs Agency (EEAA), formed in 1982, had merely served a coordinating and monitoring function.²³⁶ The new law gives the EEAA enforcement and monitoring powers as well as its traditional coordinating powers.²³⁷ Also, the new law is organized to address different types of pollution.²³⁸

Penalties in the Egyptian law now include criminal sanctions.²³⁹ This is the beginning for such legislation in Egypt, which has in the past been, along with the other Nile basin states, more willing to overlook polluting activities in the name of development.

b. Council of Europe's Trend Towards Criminal Sanctions

Egypt's law is in harmony with a trend in international water law to criminalize offenses. On June 22, 1995, the 34 nation Council of Europe presented a draft Convention "which would make breaches of

²³³ *Unified Environmental Law*, *supra* note 221. This current law repeals Egypt's environmental Law 72/1968, and confirms compliance requirements with provisions of Law 48/1982. *Id.*

²³⁴ *Id.*

²³⁵ *Id.*

²³⁶ *Law Strengthens Government Authority to Protect Environment*, BNA INT'L ENV'T DAILY, Feb. 11, 1994, available in LEXIS, ENVIRN Library, BNAIED File. [hereinafter EEAA BNA Daily, Feb. 1994].

²³⁷ *Unified Environmental Law*, *supra* note 221.

²³⁸ *Id.* The main body of the law is organized into four sections concerning protection of land, air and water, and penalties for violations. It gives the existing establishments a three-year grace period to comply with the new law before risking penalties. The Cabinet can extend this for two more years. *Id.* It provides that the EEAA will be run by a board of 20 members, some from the public business sector, as well as government officials. The members include: "the minister concerned with environmental affairs (chairman), the executive chairman of the EEAA (vice-chairman); representatives from six ministries; two environmental experts chosen by the board chairman; three representatives of nongovernmental organizations, three representatives from the public business sector, two representatives from universities and scientific research centers, a high ranking official from the EEAA, and the head of the legal department in the State Council." *Id.* at 11-12.

²³⁹ *Id.*

environmental rules a matter of criminal law.”²⁴⁰ The Convention would require “the states to adopt such appropriate measures as may be necessary to establish as criminal offenses under domestic law, when committed intentionally.”

The discharge, emission or introduction of a quantity of substances or radiation into the air, the soil or water, which causes, or creates a significant risk of death or serious injury to any person;

The unlawful discharge, emission or introduction of a quantity of substances or radiation into the air, the soil or water, which causes their lasting deterioration or causes or is likely to cause death or serious injury to any person or substantial damage to protected monuments, other protected objects, property, animals or plants.

National governments are now studying the draft Convention.²⁴¹

c. United Nations' Principles Governing Criminal Sanctions

During a United Nations Conference held in Egypt in 1995, a consensus among the participating nations was formed during a two-day workshop.²⁴² The conference focused on fighting and preventing crime, including environmental crimes.²⁴³ The fundamental legal concept in civil law for many European and Latin American countries is that companies be penalized under a regime of administrative law rather than criminal law.²⁴⁴ This is consistent with the idea that guilt is a human expression, not one that applies to corporations.²⁴⁵

²⁴⁰ *Council of Europe Looks at Criminal Prosecution for Pollution*, EUR. COMMUNITY ENERGY MONTHLY, July 14, 1995, at Energy [hereinafter *COE*]. Only the United Kingdom under its common law system already holds corporate polluters criminally liable for damages and holds owners or occupiers of contaminated land liable for environmental pollution, even if they were not responsible for the contamination, and hold them criminally liable if they fail to comply after being served with a remedial notice. In many European countries which use Roman law, only individuals can be prosecuted for a criminal act.

This draft was a result of the Council of Europe's crime committee and has not to date been approved by the Council as a whole. It follows an earlier Council of Europe Convention on civil liability for environmental damage, which opened for signatures in June 1993. While the civil liability draft dealt “with compensation for victims of environmental damage, the new draft would make it possible for polluters to be prosecuted in criminal courts.” *COE, supra* note 240.

²⁴¹ *Id.*

²⁴² *Environmental Crime: Firms Should Be Held Accountable for Crimes Against Environment*, UN Meeting Concludes, BNA INT'L ENV'T DAILY, May 10, 1995 [hereinafter *Environmental Crime*, BNA DAILY]

²⁴³ *Id.*

²⁴⁴ *Id.* (From an interview with Gunter Heine, an expert on environmental and penal law and a researcher for the Max-Planck Institute for Foreign and International Criminal Law). *Id.*

²⁴⁵ *Id.*

The workshop developed principles concerning the difficulty of ascertaining liability of the responsible individuals.²⁴⁶ The following principles were developed for inclusion in any water agreement:²⁴⁷

- An employee is held liable if he or she violates company policy.
- It is unfair to hold an employee liable if the supervisor told him or her to cause environmental harm.
- If a high ranking official is negligent, the corporation is liable.
- If the company's policy is negligent, the business can be held liable.
- Managers can be put in jail for a specific period of time for each employee that causes pollution.
- A company can evade liability if it reports an incident to the government within 24 hours.

In addition to assessing the need to modify countries' legal systems, the workshop discussed potential strategies to prevent environmental crimes. The primary element of their strategies was communication, not just between the participating states, but between state governments and corporations.²⁴⁸ This is an area which the Nile basin states have found the most frustrating; agencies in the basin states are not capable of taking on such a task.

Egypt's law establishes a wide array of fines and punishments, but makes a distinction for intentional or egregious conduct.²⁴⁹ However, consistent with the concern of the United Nations and Council of Europe, it may be difficult to determine which individual to hold liable, especially where the corporation is large and many people are involved.

Ultimately, the adoption of criminal sanctions by Egypt was necessary. Criminal sanctions are also necessary along the Nile basin

²⁴⁶ *Id.* Western Europe has tended to focus on the person in charge of particular functions in polluting corporations. However, where there are different departments and many people that play a role in the manufacturing process, it is difficult to ascertain individual liability. *Id.*

²⁴⁷ *Id.*

²⁴⁸ *Id.* At the end of the workshop, Herman Woltring, moderator for the workshop and director of the United Nations Interregional Crime and Justice Research Institute (UNCRI), outlined several strategies that the countries could take, including estimated costs of the endeavors:

- Involving high level government officials in regional conferences of about 20 countries to form stronger corporate measures. Estimated cost of meeting and follow-up activities, estimated cost: \$90,000.
- Developing a manual to facilitate a country's compliance with environmental laws, prevent environmental crimes, and prosecute them. Estimated cost: \$33,500.
- Producing a report from experts to examine national laws and how they could conform to international conventions and be implemented. Estimated cost: \$33,500.
- Improving the effectiveness of international conventions. Estimated cost: \$100,000.
- Conducting research into the seriousness of environmental crimes in a country. Estimated cost: \$14,500.

²⁴⁹ Conference on the Prevention of Crime and the Treatment of Offenders, 9th. Sess., 18 INER 323, April 29-May 8, 1995, *accepted* Plen. 9th. Sess., U.N. Doc. D26 (1995).

states. However, they should not be used arbitrarily or as a primary sanction. They should only be used when the conduct involved is intentional or egregious,²⁵⁰ not when it is a result of recklessness or negligence,²⁵¹ unless there has been a history of such action.²⁵²

Criminal law on an international level has always raised many concerns.²⁵³ However, in order for it to be effective and fair, coordination of such sanctions should be at the international level. The law should be drafted so that it applies to all the states involved in a like and uniform manner. This, along with the management of pollution, should be tasks given to an enforcement agency that represents all of the states and their interests or to individual agencies within each states' boundary.

IV. ESTABLISHING A FORUM FOR ENFORCEMENT AND RESOLUTION OF INTERNATIONAL AGREEMENTS

The Nile river basin states must establish an agency or set up a cooperative committee to regulate and enforce an international water-course agreement and provide a forum for dispute resolution.²⁵⁴ The United States has established joint commissions such as the International Boundary and Water Commission and the International Joint Commission to resolve conflicts over water resources with its neighbors.²⁵⁵ In order to establish a forum that is effective and operates on legitimate authority, the individual states must assent to its authority and the treaty that created it and to which it can now bind them.²⁵⁶

Because states are sovereign entities, they may be hesitant or unwilling to cede any authority by signing an international environmental agreement.²⁵⁷ It is crucial to the success of any international agreement that there be a forum which can uphold the agreement, provide incentives for compliance and resolve conflicts that may arise between the participating states.²⁵⁸ Such a forum must have binding authority over the states. It must function in a legislative, executive, as well as judicial role.

²⁵⁰ See COE, *supra* note 240.

²⁵¹ See Hughes, *supra* note 229.

²⁵² See *Environmental Crime*, BNA DAILY, *supra* note 242.

²⁵³ See Hughes, *supra* note 229. See also Wolf, *supra* note 224.

²⁵⁴ See *generally Developments in the Law*, *supra* note 92.

²⁵⁵ LeRoy, *supra* note 13, at 320.

²⁵⁶ Cf. Samaan, *supra* note 12, at 261-68.

²⁵⁷ *Developments in the Law*, *supra* note 92, at 1550.

²⁵⁸ See *id.* at 1552. Non-governmental Organizations (NGOs) and international development agencies can provide such a forum, as well as provide economic incentives to comply with the agreement. *Id.*

A. Its Legislative Role

The forum's legislative role will be primarily to develop regulations and oversee surveys and studies conducted. After the initial survey to determine the composition of the current Nile water is completed, the forum will be responsible for surveying such composition regularly, to determine any additional matter that may be present and dangerous. Furthermore, it should adopt laws similar to Egypt's environmental law, which requires existing factories to obtain permits. These permits should detail exactly what the factories dump into the Nile, the manner in which they dump it, and whether it is treated prior to dumping. As discussed earlier, there are a number of processes that alter or affect the quality of the water, such as the dumping of biological, chemical, or agricultural waste.²⁵⁹ The forum should bear in mind the different methods of polluting and require licensing or permitting for all matters.²⁶⁰ Having this information on file and constantly updating it will provide an effective monitoring mechanism for determining the origin of large amounts of pollutants and contaminants.

Furthermore, to be effective, the forum should create incentive programs for the states.²⁶¹ Such incentive programs may provide, among other things, opportunities to purchase foreign debt in exchange for a state's promise to provide a more elaborate environmental protection within its boundaries, and can make their loan programs contingent on the states' adoption of certain environmental criteria.²⁶² Also, such a forum may enhance compliance by setting up a training program for state officials and thereby encourage environmental awareness at the national level. The most prominent example of incorporating economic incentives into international environmental treaties and agreements is the Montreal Protocol, which utilizes a system of trade barriers and side payments as incentives to take part in the treaty.²⁶³ Establishing an agreement that provides incentives to join beyond that of mere pollution control may induce countries that

²⁵⁹ Ogolla, *supra* note 35, at 151.

²⁶⁰ *Id.*

²⁶¹ See *Developments in the Law*, *supra* note 92, at 1552.

²⁶² Samaan, *supra* note 12, at 272.

²⁶³ *Id.* The Montreal Protocol was drafted as a supplement to the Vienna Convention for the Protection of the Ozone Layer, and attempts to ensure enforcement of a treaty through an incentive program of trade barriers and side payments. *Id.* Countries not involved as a party to the Protocol are disadvantaged by the trade barriers and do not have access to the environmental technological advancements. *Id.*

are reluctant to reconsider.²⁶⁴ Specifically, if trade arrangements are designed so that states that are not a party would be at a disadvantage, then the incentive to join is greater.²⁶⁵

Finally, the forum must aim at harmonizing the various environmental laws and regulations of the individual states. Since the Nile runs through many boundaries, an array of environmental laws is useless and ineffective. This can be developed alongside the exchange of scientific and technical information, and the participation in conferences and other forms of cooperation.²⁶⁶

B. Its Executive Role

While it will be the legislative function of the forum to develop regulations and continuously monitor progress, it is its executive function that will make its plans a reality. Under its executive power, the forum will set up the plans and determine funding for its projects. Funding in the context of environmental pollution control along the Nile will not be difficult. Countries and organizations around the world have contributed money to the Nile basin states in hopes of managing the Nile pollution crisis.

In order to assure success of its executive function, the forum must be recognized by all the participating states and its authority must be binding.²⁶⁷ This will require many forms of legal maneuvering. Each country should be represented on the forum. Members should be given seats according to a number of factors such as the needs of the country, the population taking into account forecasts, the contribution of water to the Nile, potential other sources for water such as groundwater and aquifers, as well as historic and traditional uses. These factors are not meant to be exhaustive, but should be determined in the original treaty or agreement and revised when necessary. Furthermore, there should be seats reserved for United Na-

²⁶⁴ *Id.*

²⁶⁵ See *Developments in the Law*, *supra* note 92, at 1567.

²⁶⁶ Samaan, *supra* note 12, at 272. "Several concerns must be addressed in drafting new international environmental law. First, revelations from the scientific community are continuously changing the scope of environmental concerns, making it more difficult to identify the most pressing issues. Therefore, environmental lawmaking must be conducted amidst great uncertainty about the reality, cause and extent of the problem; second, because the nature of environmental problems, such as ozone depletion, require concerted action, it is necessary that at least the major contributors to the problem, present and future, be parties to the regime; third, because it is difficult to separate environmental problems from one another and from developmental concerns generally, environmental lawmaking runs the risk of either being unmanageable or not system oriented." *Id.* at 272.

²⁶⁷ See *Developments in the Law*, *supra* note 92, at 1550-55

tions Representatives and experts and scientists in the field of pollution and the environment. These positions do not need to be given voting power, but may only function in an advisory function. However, it is crucial to provide legitimacy for mutual cooperation in the eyes of the states.

Also, it will be in its executive role that this forum may negotiate with outside sources such as the United States Agency for International Development, or the World Bank, concerning loans, grants, technological, or scientific assistance.

C. Its Judicial Role

It is more appealing to take part in a treaty that includes explicit provisions of duties and obligations. By providing such detail in the original agreement, judicial interpretation will appear less arbitrary.

Currently, there is no adequate forum to resolve disputes and apply the principles of international water law. The International Court of Justice (ICJ) can resolve international issues. However, it lacks the expertise to sufficiently resolve environmental issues and to enforce environmental commitments.²⁶⁸ Only states have standing before the court, though agencies or other international forums may be the best suited and most willing to bring suits.²⁶⁹ Establishing an adjudicating body will provide three advantages. First, the forum will deal solely with the Nile basin states; therefore it can gain the legitimacy and authority needed. Secondly, it will develop expertise in the issues of that region, and the international agreements that govern. Finally, because it is local and the states are parties to the agreement, claims can be brought with expediency and decisions rendered efficiently. Again, this is functional only if the forum is recognized by the participating states and given binding authority among them.

D. Funding the Forum

Pollution along international watercourses has caught the eye of many nations and agencies around the world. It has reached such drastic levels that billions of dollars have been loaned²⁷⁰ or granted to

²⁶⁸ *Id.* at 1562.

²⁶⁹ See Statute of the ICJ, *supra* note 86, at art. 34. Therefore, NGOs and other agencies must look to their respective states to bring the disputes to the ICJ. However, public international agencies can submit information and argument to the Court at their own initiative. *Id.* art. 34(1).

²⁷⁰ See Bruce M. Rich, *The Multilateral Development Banks Environmental Policy and the United States*, 12 *ECOLOGY L.Q.* 681, 685 (1985). Rich notes that in 1983, the banks [the World Bank, the Inter-American Development Bank, the Asian Development Bank and the African Development Bank] lent over 20 billion dollars to fund projects in developing countries. *Id.*

many of the Nile countries to combat pollution.²⁷¹ In addition, the basin states have allocated large amounts of money to curtailing pollution.²⁷² Money is plentiful; what is needed is the desire for controlling pollution.

Over the past decades, development assistance agencies have become aware that the benefits of development have many environmental costs. The World Bank was a leader, in that it was the first multilateral agency that calculated and took into account the environmental impact of its activities.²⁷³ Multilateral development banks have more influence in development and policies of developing countries than any other financial institutions.²⁷⁴

With many sources for loans and grants, the Nile basin states need to efficiently allocate their moneys together rather than to combat pollution on their own. When dealing with an international watercourse, states upstream necessarily affect states downstream. Thus if their pollution prevention and control mechanisms are harmonized, it will provide a more efficient and reachable goal.

The role of the agency or forum would be to oversee the allocation of money by countries such as the United States and institutions such as the World Bank to the Nile basin states, and to provide technical and economic monitoring and support.

²⁷¹ See ME Exec Reps, Water Supply, *supra* note 3.

As of 1993, ongoing US AID projects included:

- USAID No. 263-0100 — Alexandria Wastewater Expansion (1977-1993), for the financing and construction of a sewage development program, \$390 million.
- USAID No. 262-0127 and 161.03 — Provisional Cities Development, urban infrastructure, improve water and wastewater systems (1984-1994), \$110 million.
- USAID No. 263-0173 — Cairo Sewage II, increasing capacity of treatment plants and expanding sewage collection systems in Cairo (1984-1994), \$816 million.
- USAID No. 263-0174 — Canal Cities Water and Wastewater II (1987-1997), \$380 million, improvement of water and wastewater services.
- USAID No. 263-0176 — Water and Wastewater Institutional Support (1985-1994), \$15 million increasing capabilities to meet these needs.
- USAID No. 263-0812 — Local Development II, including water and wastewater services (1985-1993), \$481 million for improving basic water services to water and wastewater services to low-income residents in rural and urban residents.

²⁷² *Id.* Egypt has a five-year plan which allocates to water pollution treatment plants in Cairo, Alexandria, and other locations, allocating \$303 million in special allocations for its first two years (1992 and 1993). *Id.*

²⁷³ See John W. Kindt, *Providing for Environmental Safeguards in the Development Loans Given by the World Bank Group to the Developing Countries*, 5 GA. J. INT'L COMP. L. 540, 544 (1975).

²⁷⁴ Rich, *supra* note 270, at 685; stating that, in 1983, the banks lent over twenty billion dollars to fund projects in developing countries, four times the amount that was committed by the largest bilateral development agency, the United States Agency for International Development (USAID). *Id.*

CONCLUSION

International river basin water shortage and pollution is a modern day nightmare. Water levels are falling, droughts are persistent, and whatever water is available is polluted and dangerous to drink. The Nile basin states face all of these problems. The existence of current international treaties and agreements among a few of the Nile basin states are ineffective. Without including all the Nile basin states, and taking into consideration the pollution of the Nile and its effect on the amount of usable water, the ultimate allocation of water prescribed in these water sharing agreements is not representative of what the agreements originally intended. The Nile basin states are ready to negotiate. They have all suffered from famine, poor water quality, and a population explosion. With a legitimate fear of war over water rights, these states are finally ready to recognize the rights of other riparians.