UNIVERSITIES COUNCIL ON WATER RESOURCES
WATER RESOURCES UPDATE, ISSUE 127, PAGES 87-93, FEBRUARY 2004

Is Sustainable Development a Serviceable Legal Standard in the Management of Water?

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Water suitable for human needs is an increasingly scarce resource, particularly when viewed against the backdrop of an expanding global population (Diaz and Dubner 2001; Engelman and LeRoy 1997; Gleick 2002; Postel 1999). The exponential growth of the human population in the twentieth century was not the only force driving demand for water, for *per capita* consumption has grown even faster than human populations in most parts of the world (Dellapenna 1997; La Rivière 1989; United Nations Commission on Sustainable Development 1997). The prospect of global climate change could worsen this situation dramatically (Abu-Taleb 2000; Bazzaz 1994; Symposium 1999; Symposium 2000). Fresh water is, however, one of the most essential resources for human survival, let alone for human thriving. Deprive us of air, and we die in minutes. Deprive us of water, and we die in days. Deprive us of food, and we can go on for weeks or months—as inmates of concentration camps or persons on hunger strikes have demonstrated. And, as a Turkish businessman recently commented, "Countless millions of people have lived without love, but none without water" (Nachmani 1994). Whether that last is true, the point remains—there is a continuum of needs for humans and other entities, and water stands very near the end of the continuum because without it life cannot survive for any significant length of time.

While water is found nearly everywhere, water for our essential needs is often in the wrong place, inadequate in amount, or too impure. For example, annual precipitation in Egypt amounts to a mere 50 cubic meters per person, while in Zaire annual precipitation produces 76,000 cubic meters per person (Kukk and Deese 1996). Furthermore, precipitation patterns usually vary considerably with the season. Spring floods are often followed by summer droughts. The qualitative variability of water—one of the aspects of water that makes it so useful to us—means that pure water is a manufactured product that simply does not exist in nature. Humans and most plants and animals of use to humans can tolerate only a narrow range of impurities in the water they consume.

Water has one other quality that, when combined water's unusual importance, gives rise to considerable risk of conflict among neighboring nations or communities (McCaffrey 2000; Vayrynen 2001). Water is an ambient resource that largely ignores human boundaries. Some 264 river basins in the world—home to nearly 50 percent of the world's population—are shared by more than one nation (Wolf 1998). The most cordial and cooperative of neighboring States have found it difficult to achieve mutually acceptable arrangements to govern their transboundary surface waters even in relatively humid regions where fresh water is usually found in sufficient abundance to satisfy most or all needs. When the region is arid, conflict becomes endemic and intense despite otherwise friendly relations or even membership in a federal union. No wonder the English derived the word "rival" from the Latin word *"rivalis,"* meaning persons who live on opposite banks of a river (Schwebel 1982). Furthermore, the problems involving transboundary aquifers have hardly begun to be faced.

The foregoing has led many observers to conclude that the major wars of the twenty-first century will be over water rather than oil or other resources

(Gleick 1998). Remarkably, with all the rivalry and potential for conflict, very few, if any, conflicts in recent centuries have in fact been over water resources (Wolf 1998). If conflict is to be avoided, States sharing a water resource must undertake to create and implement legal mechanisms for resolving disputes and for cooperatively managing the resource. And that development must be sustainable over time, or arrangements must certainly break down, with conflict ensuing (Birnie and Boyle 2002). This has been recognized—albeit only in summary fashion—in the two most recent authoritative statements of the customary international law of transboundary waters (International Court of Justice 1997; United Nations Convention 1997, art. 5).

The emerging legal requirement that the development of water (and other resources) be sustainable is open to considerable debate about its meaning and application (Boyle and Freestone 1999; Carley 1998; United Nations Commission 1997). Furthermore, the requirement often is found in "soft law" instruments (Brown Weiss 1999; Dupuy 1991; Shelton 2000; Young 1998). In this paper, I briefly examine the emerging norm of sustainability and consider the question of whether, at least in its present state of development, that norm can serve as a useful criterion for water management.

Sustainable Development as a Legal Principle

The seeds of the obligation of sustainable development lie in the recognition that, as expressed in the very first principle of the *Stockholm Declaration*, "Man [*sic*] has the fundamental right to freedom, equality and adequate conditions of life, in an environment of a quality that permits a life of dignity and well-being, and he bears a solemn responsibility to protect and improve the environment for present and future generations" (United Nations 1972, pr. 1). The *Stockholm Declaration* went on to indicate that while "[i]n the developing countries most of the environmental problems are caused by under-development," the *Declaration* also went on to proclaim that "the developing countries must direct their efforts to development, bearing in mind their priorities and the need to safeguard and improve the environment" (United Nations 1972, pr. 4). Finally, the *Declaration* proclaimed, "To defend and improve the human environment for present and future generations has become an imperative goal for mankind—a goal to be pursued together with, and in harmony with, the established and fundamental goals of peace and world-wide economic and social development" (United Nations 1972, pr. 6). The *Declaration* also proclaimed the premises of sustainable development in several other principles: "The capacity of the earth to produce vital renewable resources must be maintained and, wherever practicable, restored or improved" (United Nations 1972 pr. 3); and "The non-renewable resources of the earth must be employed in such a way as to guard against the danger of their future exhaustion and to ensure that benefits from such employment are shared by all mankind" (United Nations 1972, pr. 5).

The obligation of sustainable development now appears in numerous international instruments (United Nations 1992, pr. 8). The principle was even included in the preamble to *World Trade Organization Agreement* (Final Act 1994). And the obligation of sustainability has been recognized as part of the customary international law governing the management of transboundary waters (International Court of Justice 1997, par. 140; United Nations Convention 1997, art. 5). Finally, the norm of sustainability has been incorporated into a growing number of international water management treaties as well as national laws (Lake Victoria Fisheries Convention 1994, art. II(2); Luso-Spanish Convention 1998, arts. 4(1), 15(1); Meuse Agreement 1994, art. 3(5); Rhine Convention 1998, art. 4; Scheldt Agreement 1994, art. 3(5); Southern Africa Protocol 1995, art. 2(3)).

There is not only agreement on the requirement that development be sustainable, but there is also considerable agreement regarding the content of that requirement—at least at a high level of abstraction. We can consult the *New Delhi Declaration on Principles of International Law Relating to Sustainable Development*, approved at the New Delhi Meeting of the International Law Association.in April 2002 (International Law Association 2002). That declaration affirms the duty of States to ensure the sustainable development of natural resources generally, including the principle of equity, the goal of the eradication of poverty, the importance of the precautionary approach to human health, natural resources, and ecosystems, the principle of public participation and access to

information and justice, the obligation of good governance, and the reality that the management of resources must take place in an integrated fashion. The United Nations sponsored World Summit on Sustainable Development in Johannesburg, South Africa, in September 2002 adopted a similar declaration (United Nations 2002). Yet the application of these abstract principles to concrete situations of water management is not as obvious as this cursory statement might suggest (Dernbach 2002).

Applying the Norm of Sustainability to Water Management

In an era of global water shortage, probably no goals are more important than achieving the sustainability of water resources. Consider the definition put forward by Peter Gleick and his colleagues at the Pacific Institute. They define sustainability as "the ability of human society to endure and flourish into the indefinite future without the use of water that supports undermining the integrity of the hydrological cycle or the ecological systems that depend on it" (Gleick et al. 1995; Birnie and Boyle 2002; Fuentes 1998). Laudable goals, but how do we translate this into concrete decisions. No wonder some declare that the concept of "sustainability" is only a slogan in environmental battles rather than an actual criterion of policy choice (Esty 1998; Ruhl 1999).

That water resources are finite and that aggregate demand is approaching or exceeding the available water supply requires that sustainability be the pervasive criterion of both public and private water management (Fuentes 1998; United Nations Convention 1997, art. 5). Yet one can never be certain that one is managing current use in a fashion that will not compromise future need. At the least, sustainable use requires viewing water resources as parts of ecosystems that can be managed effectively only by giving careful attention to the interconnections of the parts of the system (Korhonen 1996; Symposium 1994; Symposium 1997). In particular, one must ask whether, for a renewable resource such as water, the criterion ought to be "sustainable development" or "sustainable use."

Economist Kenneth Boulding developed the concept of "sustainable use" nearly 40 years ago (Boulding 1966). He was speaking about the use of resources generally, proposing the substitution of a "spaceship economy" for the "cowboy economy" that he argued had been the predominant approach to resource use throughout human history. Others have found this argument persuasive for all sorts of resources (Jacobs 1969). Whether this model is useful for other resources, it seems particularly suited to renewable resources like water (Fuentes 1998, 174-86; Hey 1995). Sustainable use requires decisions regarding the management of water that do not seriously impair the ecological integrity of the resource or preclude its continuing use by present and future generations.

The concept of sustainability was always implicit in the law relating to water resources, for the right to use water equitably is a "usufructory" right rather than absolute ownership. The word "usufructory" combines Latin words that express two of the three defining characteristics of absolute ownership: *usus*, *fructus*, and *abusus*. The right to the use of the water and to the fruits of that use simply never included the right to waste, destroy, or fully consume the resource (One River Plaza Condominium Association v. Mitchell 1993, 946). This legal tradition, as well as the fact that the hydrological cycle operates on a time scale that is meaningful for humans, suggests that the proper standard for water usage is "sustainable use" rather than "sustainable development."

Determining what uses are sustainable must remain a highly fact-specific analysis of the proper uses of a particular resource in a particular setting. The basic notions captured in the phrase "sustainable use" include that the needs of future generations as well as the present generation must be taken into account in resource planning and use, that all persons should have equitable access to the resources they need, that therefore resources (whether renewable or not) ought not to be exhausted, and that resource management must take place in an integrated manner (Brundtland Report 1987; Declaration of Principles 1996, § 1.3; International Law Association 2002). Sustainable use generally requires the coordination of water allocation with both the protection of water quality and with measures aimed at coping with droughts and other water emergencies. Sustainable use generally will also require the conjunctive and integrated management of water sources of a water basin and the limiting of withdrawals to the safe yield

of each water source. Exceptional circumstances, at most, would only rarely allow deviation from these principles.

The importance of attempting to achieve sustainable use requires caution in altering these ecosystems in what are probably irremediable ways. The concept of "sustainable use" thus is closely related to the precautionary principle that has become central to international environmental law (Freestone & Hey 1966; Harding & Fisher 1999). The International Court of Justice in the *Gabcíkovo-Nagymoros Case*, however, made no mention of the precautionary principle although the Hungarian pleadings did raise the point (International Court of Justice 1997). Thus far, only the Indian and Pakistani Supreme Courts have embraced that principle as a legal obligation (Vellore Citizens Welfare Forum v. Union of India 1996; Mehta v. Union of India 1997; Zia v. WAPDA 1994).

"Sustainable use" is not the same as equitable utilization (United Nations Convention 1997, art. 5). A use might be equitable as between two or more States sharing a drainage basin and yet not be sustainable. "Sustainable use" means the integrated management of resources taking seriously the needs of future generations as well as the current generation, assuring equitable access to resources, optimizing the use of non-renewable resources, and averting the exhaustion of renewable resources. If a State is careful to assure the sustainable use of a transboundary water source within its boundaries, while one or more other States sharing the source do not take steps to assure the sustainability of their uses, how should that affect the allocation of the waters—or the benefits of the waters—among the several States (Fuentes 1998)?

Certainly, a State that manages its waters sustainably should be rewarded to some extent, yet it often will be difficult to verify the amount of water saved through sustainable practices. Moreover, simply to award the saved water to a State as a reward for sustainable use risks neglecting the often pressing needs in other States that, without an enhanced allocation of water, cannot be coped with through sustainable practices. In other words, to award an allocation of water based on a comparison of the level of conservation in several States—i.e., solely as a reward for conservation or other sustainable practices—creates a real possibility that the rewarded State will use the allocated water for inessential uses while neighboring States cannot meet essential needs.

Finally, sustainable use cannot be an absolute obligation. Not only are the varied circumstances of human need and water availability too complex to allow one to declare any absolute obligation of sustainable use, but in too many situations whether a use is sustainable will itself be highly debatable. Whether one posits the obligation of sustainability in terms of an obligation to use due diligence to achieve sustainable use or as something else, that obligation must necessarily leave a good deal open to debate and discretion (Birnie & Boyle 2002; MacDonnell 1997; Tarlock 2000).

"Uncoupled Aquifers" and Sustainability

The norm of sustainable use is predicated on the reality that water moves through the hydrologic cycle constantly and in a time-scale that is meaningful to humans. Other resources—such as iron ore or oil—also move through a cycle, but a cycle that is so long that the existence of the cycle is largely meaningless to humans. Certain underground waters—variously called "fossil waters" or "uncoupled aquifers"—similarly move through the hydrologic cycle at such attenuated speeds that for all practical purposes they are not renewed. For such waters, any use at all cannot be sustainable use as defined here (Glennon 1991). The legal standard then cannot be sustainable use, but rather is sustainable development. These waters then pose the same question that oil and iron ore, among many other resources, pose: How is one to develop the resource sustainably?

There is no clear answer to the question of what constitutes the sustainable development of a non-renewable resource. Even the *UN Convention* failed to address the law applicable to such waters (UN Convention 1997, art. 2(a)). Humans might choose not to use such resources at all, or they might choose to use them. If they choose to use them, the only question is how quickly the resource will be exhausted. Courts in the United States, for example, have adopted various benchmarks for how quickly a groundwater mining operation is to exhaust a non-renewable aquifer (Chavez 2000). Such a use of groundwater cannot meaningfully be called "sustainable use." It cannot even be termed

sustainable development unless the use of the resource is managed in such a way that the fruits of the use are used to develop alternative sources of water to be available when, or before, the fossil waters are, at least in terms of affordable extraction, exhausted. Perhaps sustainable development at the least requires that in using these waters, only the minimum absolutely necessary to accomplish the purpose of the use be extracted from the aquifer (Fuentes 1998; MacDonnell 1997; Wong, Owens-Viani, and Gleick 1999).

Conclusion

Increasingly, laws on many fronts—international agreements and court decisions, national laws and regulations, and local decisions—incorporate a requirement of sustainability. While it is fairly easy to translate that broad concept into a set of verbal descriptions of what factors must be considered in deciding what qualifies as sustainable use or as sustainable development, going from there to specific decisions is by no means clear. In this context, for water, at least, sustainable use is a clear and enforceable standard: No more water should be used in a year (or over a period of years) than is naturally or artificially recharged during the same period. Sustainable development, on the other hand, requires the exercise of judgment as factors such as the needs of present generations, of ecosystems, and of future generations are balanced against each other (Maggio 1997). One must also consider fairness between users, allow for participation by various stakeholders in the governance of the resource, and the integrated and adaptive management of resources in light of the precautionary principle (Costanza 1998; International Law Association 2002). Sustainable development, in other words, prescribes a process of analysis and decision making, rather than a strict legal standard for resource use.

Author Information

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Professor Dellapenna is Director of the Model Water Code Project of the American Society of Civil Engineers and Rapporteur of the Water Resources Committee of the International Law Association. As Director of the Model Water Code Project, he has led in the drafting of the Appropriative Rights Model Water Code and the Regulated Riparian Model Water Code, and supervised the preparation of Model Agreements for Sharing and Use of Transboundary Waters and Model Water Regulations for Administration and Trading in Humid Areas. As Rapporteur, he is leading the revision of the *Helsinki Rules*, the generally recognized restatement of the customary international law of transboundary waters. He has served as a consultant on water management problems to the Directory-General of Natural Resources (Direcçao-Geral dos Recursos Naturals) in Portugal and has consulted in the United States and abroad on problems of water management. He contributed nearly the whole of volumes 1 and 3, part of volumes 2 and 6 of the treatise *Waters and Water Rights*, the standard reference on water law in the United States.

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