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Ecosystem Services and Human Well-Being in a Globalized World: Assessing the Role of Law

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ABSTRACT

There is no denying the close linkage between ecosystem services and human well-being. Human well-being is dependent on the sustainable management of ecosystem services. With economic globalization and free trade, there is an increasing demand for these services. Yet, poverty, inefficient management of common resources, and inadequate legal and governance frameworks have a negative impact on human well-being. This article examines the impact of globalization as well as the legal mechanisms for the management of ecosystem services arguing that the need for a concerted and synergistic legal approach to manage ecosystem services in a sustainable manner that includes human rights principles alongside market-based instruments.

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I. INTRODUCTION

According to the Millennium Ecosystem Assessment (MA), an ecosystem is a "dynamic complex of plant, animal, and microorganism communities and the nonliving environment interacting as a functional unit."[1] The MA elaborates on interaction between humans and ecosystems, using the term "ecosystem services." The MA states:

> Ecosystem services are the benefits people obtain from ecosystems. These include *provisioning services* such as food, water, timber, and fiber; *regulating services* that affect climate, floods, disease, wastes, and water quality; *cultural services* that provide recreational, aesthetic, and spiritual benefits; and *supporting services* such as soil formation, photosynthesis, and nutrient cycling.[2]

Thus, "ecosystem services provide both the conditions and processes that sustain human life."[3]

The concept of ecosystem services was developed in the late 1990s. Ecosystem services influence our security, the basic materials necessary for a good life, our health, our good social relations, and ultimately, our freedom of choice and action. In short, they influence our well-being.[4] The MA emphasizes the link between ecosystem services and human well-being:

> Humans are fully dependent on Earth's ecosystems and the services that they provide, such as food, clean water, disease regulation, climate regulation, spiritual fulfilment, and aesthetic enjoyment. . . .When an ecosystem service is abundant relative to the demand, a marginal increase in ecosystem services generally contributes only slightly to human well-being (or may even diminish it). But when the service is relatively scarce, a small decrease can substantially reduce human well-being.[5]

While several international organizations have used the terminology "ecosystem services" in their documents, the term is not uniformly defined. In many cases, ecosystem services have been used as a synonym for "ecosystem benefits," "ecosystem goods," "ecological services," or "environmental services."[6] Furthermore, the MA does not attempt to make a clear distinction between goods and services, and most of the provisioning ecosystem services

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1. Millennium Ecosystem Assessment, Ecosystems and Human Well-Being: Synthesis, at v (2005), *available at* http://www.millenniumassessment.org/documents/document.356.aspx.pdf.
2. *Id.*
3. James E. Salzman, *A Field of Green: The Past and Future of Ecosystem Services*, 21 J. Land Use & Envtl. L. 133, 134 (2006).
4. Millennium Ecosystem Assessment, *supra* note 1, at vii, fig. B.
5. *Id.* at 49.
6. Ezequiel Lugo, *Ecosystem Services, the Millennium Ecosystem Assessment, and the Conceptual Difference Between Benefits Provided by Ecosystems and Benefits Provided by People*, 23 J. Land Use & Envtl. L. 243, 251–55 (2008).

(products obtained from ecosystems including water, food, and timber) can be termed as "ecosystem goods."[7]

To some, "ecosystem goods are generally tangible, material products that result from ecosystem processes, whereas ecosystem services are usually improvements in the condition of things of value."[8] According to Geoffrey Heal et al., ecosystem services include "the production of goods (such as seafood and timber), life support processes (such as pollination, flood control and water purification), and life-fulfilling conditions (such as beauty and serenity), as well as the conservation of options for the future (such as generic diversity)."[9] Pursuant to this definition, water and wood in their natural state are ecosystem goods, while the water purification function of a natural wetland and the carbon sequestration function of a forest are ecosystem services. Ecosystem services can even include the economic activity connected to outdoor recreation and eco-tourism.[10] This adds an additional complexity of valuing ecosystem services that are "extra-market and largely unpriced."[11] In most cases, the process of assessing the economic value is connected to how humans place value on these non-market services.

In his article on ecosystem services, Ezequiel Lugo illuminates some problems with this definitional disparity: first, the use of multiple terms to define ecosystem services highlights a lack of consensus among international environmental agreements regarding the definition of ecosystem services; and second, if ecosystem services are synonymous with environmental services, some fear that as a result, people may have to pay for these services, including water services, which should be free. Noting the economic value of the services, Lugo is of the opinion that a clear definitional distinction is required between ecosystem services and environmental services.[12] For purposes of this article, the term ecosystem services refers to the benefits provided by ecosystems to people. The emphasis is on the provisioning ecosystem services such as food and water.

In addition to presenting these background conceptual issues, this article argues that the international legal framework and current institutional

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7. Millennium Ecosystem Assessment, *supra* note 1, at 40.
8 Evan Notman et al., State of Knowledge: Ecosystem Services from Forests (2006), *available at* http://www.fs.fed.us/ecosystemservices/pdf/state-of-knowledge.pdf.
9 Geoffrey Heal et al., *Protecting Natural Capital through Ecosystem Service Districts*, 20 Stan. Envtl. L.J. 333, 334 (2001), *cited in* Gretchen C. Daily et al., *The Value of Nature and the Nature of Value*, 289 Science 395 (2000).
10. Alicia Robbins, Ecosystem Services Markets 2 (27 Oct. 2005), *available at* https://digital.lib.washington.edu/dspace/bitstream/handle/1773/2244/tp12.pdf?sequence=1. This paper is part of a series of discussion papers to provide background information at the Saving Washington's Working Forest Land Base Forum, organized by the University of Washington.
11. *Id.* at 3.
12. Lugo, *supra* note 6, at 260–61.

agreements do not provide adequate protection to ecosystem services. Most of the international human rights treaties deal with human health issues but do not link ecosystem services to human well-being. Likewise, many early environmental treaties focused on species protection, however, in recent years, and specifically since 1992, there has been a shift, with some reference to a market-based approach, from species protection to resource or ecosystem protection.[13] For example, both the Convention on Biological Diversity (CBD) and the United Nations Framework Convention on Climate Change (UNFCCC) mention market-oriented instruments in relation to biodiversity management or carbon sequestration.[14]

This article also analyzes the role that the law plays in protecting or managing provisioning ecosystem services, such as water and food essential for human survival, the impact of globalization on ecosystem services, and ways to balance economical and ecological interests with human well-being. Parts II and III of this article address the relationship between provisioning ecosystem services and human rights and environmental treaties. Part IV of this article addresses the impact of globalization on these services, and Part V examines the role of law in obtaining equitable access to ecosystem services.

II. PROVISIONING ECOSYSTEM SERVICES AND HUMAN RIGHTS

Protection of ecosystem services is closely and intrinsically linked to the protection of human rights because people are integral parts of ecosystems. Provisioning ecosystem services, such as water and food,[15] are directly linked with human security, acquiring basic materials for a healthy life (such as nutritious food), and having access to clean water.[16] The interaction between humans and ecosystems is illustrated by the increased production of some ecosystem services, such as food crops and freshwater, through technological advancement. While the world population doubled between 1960

13. Anantha Kumar Duraiappah, Markets for Ecosystem Services: A Potential Tool for Multilateral Environmental Agreements (2006), *available at* http://www.iisd.org/pdf/2007/economcs_markets_eco_services.pdf.
14. Convention on Biological Diversity, *adopted* 5 June 1992, arts. 20–21, 1760 U.N.T.S. 142 (*entered into force* 29 Dec. 1993), *available at* http://www.cbd.int/doc/legal/cbd-un-en.pdf; United Nations Framework Convention on Climate Change (UNFCCC), *adopted* 9 May 1992 (*entered into force* 21 Mar. 1994), *available at* http://unfccc.int/resource/docs/convkp/conveng.pdf.
15. "[W]ater is both a provisioning service, since ecosystems are the source of water used by people, and a supporting service, since water is required for life on Earth and thus supports all other ecosystem processes." Millennium Ecosystem Assessment, *supra* note 1, at 106.
16. *Id.* at 10.

and 2000, water use also doubled, but food production increased by 160 percent.[17] Yet, increased demand and prices for food crops have created heightened food security risks, sending around 100 million more people into extreme poverty.[18]

This intensification of ecosystem output has put increased pressure on the forest and mountain ecosystems that are the largest provider of freshwater. The construction of dams and diversions, which could make water easily available for human use, has negative effects on rivers and lakes. At the same time, the per capita availability of water is declining and negatively impacting human well-being. Water scarcity is a significant global issue and is highlighted in the Millennium Development Goals (MDG) Report 2008:[19] "human, institutional and financial capital limit access to water, even though water in nature is available locally to meet human demands."[20]

Whether direct or indirect, human action or inaction significantly affects ecosystem services, therefore also affecting human well-being.[21] Those actions that work to deny access to ecosystem services to those who depend on those services lead to a denial of human rights. For example, serious impacts from climate change are affecting indigenous peoples, the majority of whom live in extremely vulnerable ecosystems. Human rights cannot be fully realized without the environmental aspects of ecosystem services that are essential to the right to life and all other rights that contribute to and constitute the pre-conditions of its enjoyment. With increased globalization and free trade, available market-based mechanisms may not be able to protect poor and vulnerable communities. This raises a concern that fundamental human rights, such as the right to life and the rights to water and food, may not be adequately protected at the national level in many developing countries. The question then is whether existing human rights mechanisms provide the tools to protect ecosystem services—especially, food and water.

A. Ecosystem Services in a Human Rights Framework

With the rapid degradation of ecosystem services, a supporting legal framework is necessary to protect the ecosystem services for human well-being

17. *Id.*
18. *Id.* at 6.
19. Goal 7 aims to halve the proportions of people in the world without access to safe drinking water by 2015. United Nations, The Millennium Development Goals Report 2008, at 40 (2008). Similarly, the 2002 World Summit on Sustainable Development (WSSD) reiterated the aim to halve the proportion of people without access to safe drinking water. *Report of the World Summit on Sustainable Development*, § II, IV, U.N. Doc. A/CONF. 199/20 (2002), *available at* http://www.un.org/jsummit/html/documents/summit_docs.html.
20. The Millennium Development Goals Report 2008, *supra* note 19, at 40.
21. Millennium Ecosystem Assessment, *supra* note 1, at v.

and poverty alleviation. The international human rights framework, with its established mechanisms of monitoring, enforcing compliance, and dispute settlement, can play an important role in preserving ecosystem services. Yet, within current international human rights treaties, there is no direct reference to ecosystem services and their link to human rights. In addition, no global human rights treaty proclaims a substantive right to ecosystem services for human well-being.

However, the existence of human rights that include the availability of and access to freshwater, food, subsistence agriculture, and accommodation are linked to ecosystem services. Reference to these rights can be found in the 1948 Universal Declaration of Human Rights (UDHR), which states that everyone has the right to life, liberty, and security of person. The UDHR also states that everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including having access to food, clothing, and housing.[22] The International Covenant on Economic, Social and Cultural Rights (ICESCR) and the Convention on the Rights of the Child (CRC) also establish the substantive right to food.[23] By ratifying these agreements, states agree to respect, protect, and fulfill the progressive realization of the rights therein contained.[24] For example, the "right to adequate food is realized when every man, woman and child, alone or in community with others, have physical and economic access at all times to adequate food or means for its procurement."[25]

In addition to the UDHR, ICESCR, and CRC, a number of other instruments provide guidelines on the rights to water, food, and food security.[26]

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22. Universal Declaration of Human Rights, *adopted* 10 Dec. 1948, G.A. Res. 217A (III), U.N. GAOR, 3d Sess. (Resolutions, pt. 1), at 71, art. 25, U.N. Doc. A/810 (1948), *reprinted in* 43 Am. J. Int'l L. 127 (Supp. 1949). This list is not an all-inclusive list and other elements, such as water, can be included. Peter H. Gleick, *The Human Right to Water*, 1 Water Pol'y 487 (1998).
23. International Covenant on Economic, Social and Cultural Rights (ICESCR), *adopted* 16 Dec. 1966, G.A. Res. 2200 (XXI), U.N. GAOR, 21st Sess., Supp. No. 16, arts. 11.1, 2, U.N. Doc. A/6316 (1966), 993 U.N.T.S. 3 (*entered into force* 3 Jan. 1976); Convention on the Rights of the Child, *adopted* 20 Nov. 1989, G.A. Res. 44/25, U.N. GAOR, 44th Sess., Supp. No. 49, art. 24(2)(c), U.N. Doc. A/44/49 (1989) (*entered into force* 2 Sept. 1990), *reprinted in* 28 I.L.M. 1448 (1989).
24. "States Parties to the ICESCR have the obligation to respect, promote and protect and to take appropriate steps to achieve progressively the full realization of the right to adequate food." FAO, Intergovernmental Working Group for the Elaboration of a Set of Voluntary Guidelines to Support the Progressive Realization of the Right to Adequate Food in the Context of National Food Security, annex I, ¶ 17 (Sept. 2004), *available at* http://www.fao.org/docrep/meeting/008/J3345e/j3345e01.htm#a1.
25. *The Right to Adequate Food,* General Comment No. 12, U.N. ESCOR, Comm. on Econ., Soc. & Cult. Rts., 20th Sess., ¶ 6, U.N. Doc. E/C.12/1999/5 (1999).
26. For example, General Assembly Resolution 54/175 states that "[t]he rights to food and clean water are fundamental human rights and their promotion constitutes a moral imperative both for national Governments and for the international community." *The Right to Development, adopted* 17 Dec. 1999, G.A. Res. 54/175, U.N. GAOR, 54th Sess.,

The 2004 Food and Agriculture Organization of the United Nations (FAO) guidelines on food security highlight the essential elements of poverty alleviation, including the pursuit of "inclusive, non-discriminatory and sound economic, agriculture, fisheries, forestry, land use, and, as appropriate, land reform policies" by states.[27] The guidelines state that "[s]tates should take into account the shortcomings of market mechanisms in protecting the environment and public goods," including rights to "land, water, forests, fisheries, and livestock," while keeping in mind the special ties certain groups have to natural resources.[28] The FAO explains that to "improve access to" and "promote sustainable use of" water, there is a need to balance "the requirement of preserving or restoring the functioning of ecosystems with domestic, industrial and agricultural needs, including safeguarding drinking water quality."[29] Furthermore, the guidelines indirectly link human rights to ecosystem services by reaffirming the need for national "mechanisms to protect ecological sustainability and the carrying capacity of ecosystems to ensure the possibility for increased, sustainable food production for present and future generations, prevent water pollution, protect the fertility of the soil, and promote the sustainable management of fisheries and forestry."[30]

The most recent human rights document that elaborates on the right to water is General Comment 15 on the implementation of Articles 11 and 12 of ICESCR.[31] The comment notes that "[w]ater is a limited natural resource and a public good fundamental for life and health" and calls it "a prerequisite for the realization of other human rights."[32] The comment also highlights that the continuing contamination, depletion, and unequal distribution of water is exacerbating existing poverty rates and clarifies that "[s]tates parties have to adopt effective measures to realize, without discrimination, the right to water, as set out in this general comment."[33] According to the comment, "[t]he human right to water entitles everyone to sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic uses."[34] The Committee found that while ICESCR Article 11(1) does not specifically mention water, it

> specifies a number of rights emanating from, and indispensable for, the realization of the right to an adequate standard of living "including

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U.N. Doc. A/Res/54/175 (2000). *See also Report of the World Summit on Sustainable Development, supra* note 19, ¶ 18.

27. FAO, *supra* note 24, annex I, § II(2.5).
28. *Id.* annex I, § II(4.10, 8.1).
29. *Id.* annex I, § II(8.11).
30. *Id.* annex I, § II(8.13).
31. *The Right to Water*, General Comment No. 15, U.N. ESCOR, Comm. on Econ., Soc. & Cult. Rts., 29th Sess., Agenda Item 3, U.N. Doc. E/C.12/2002/11 (2002).
32. *Id.* ¶ 1.
33. *Id.*
34. *Id.* ¶ 2.

> adequate food, clothing and housing." The use of the word "including" indicates that this catalogue of rights was not intended to be exhaustive. The right to water clearly falls within the category of guarantees essential for securing an adequate standard of living, particularly since it is one of the most fundamental conditions for survival. . . . The right to water is also inextricably related to the right to the highest attainable standard of health (art. 12, para. 1) and the rights to adequate housing and adequate food (art. 11, para. 1). This right should also be seen in conjunction with other rights enshrined in the International Bill of Human Rights, foremost amongst them the right to life and human dignity.[35]

While the aforementioned economic, social, and cultural rights form a significant part of the human rights discourse, they are necessarily interdependent with civil and political rights.[36]

B. Procedural Rights and the Promotion of Ecosystem Protection

Along with substantive human rights, certain procedural human rights can be used to manage ecosystem services at the national and regional level, such as rights to information, freedom of speech and public participation, and access to effective remedies. In fact, substantive and procedural rights are equally essential to managing ecosystem services. The UDHR recognizes political participation and freedom of assembly, opinion, and expression.[37] While the UDHR is not legally binding (although part of customary international law), the International Covenant on Civil and Political Rights (ICCPR) is binding and also addresses these obligations.[38] In addition, the Aarhus Convention and principle 10 of the 1992 Rio Declaration firmly establish participatory rights in international law.[39] Although the Aarhus Convention

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35. *Id.* ¶ 3.
36. All human rights are universal, indivisible and interdependent and interrelated." Vienna Declaration and Programme of Action, *adopted* 25 June 1993, U.N. GAOR, World Conf. on Hum. Rts., 48th Sess., 22d plen. mtg., ¶ 5, U.N. Doc. A/CONF.157/23 (1993), *reprinted in* 32 I.L.M. 1661 (1993). *See also* Jack Donnelly, Universal Human Rights in Theory and Practice 27–33 (2d ed. 2003).
37. Universal Declaration of Human Rights, *adopted* 10 Dec. 1948, G.A. Res. 217A (III), U.N. GAOR, 3d Sess. (Resolutions, pt. 1), at 71, art. 19–20, U.N. Doc. A/810 (1948), *reprinted in* 43 Am. J. Int'l. L. 127 (Supp. 1949).
38. International Covenant on Civil and Political Rights, *adopted* 16 Dec. 1966, G.A. Res. 2200 (XXI), U.N. GAOR, 21st Sess., Supp. No. 16, art. 19, 25, U.N. Doc. A/6316 (1966), 999 U.N.T.S. 171 (*entered into force* 23 Mar. 1976).
39. Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters, *adopted* 25 June 1998, U.N. ESCOR, Econ. Comm'n for Eur., Comm. on Envtl. Pol'y, 4th Ministerial Conf., U.N. Doc. ECE/CEP/43 (1998) [hereinafter Aarhus Convention]; Rio Declaration on Environment and Development, *adopted* 14 June 1992, U.N. GAOR, 19th plenary mtg., princ. 10, U.N. Doc. A/CONF.151/26/Rev. 1 (Vol. I) (1993).

has a European basis, it is open to all states and provides standards that might usefully be drawn upon at the international level to protect ecosystem services.[40] The Aarhus Convention reaffirms that public participation is closely linked to human rights and provides for the right to receive environmental information held by public authorities, the right of active involvement and participation from an early stage in environmental decision making, and access to justice.[41]

Accountability of public bodies and participation of all stakeholders remain a crucial but underdeveloped component of the right to food and water. In the water sector, the 2004 Berlin Rules, a non-binding instrument adopted by the International Law Association, recognizes the right of public participation in the management of waters.[42] It adds that people should be "able to participate, directly or indirectly, in processes by which those decisions are made and have a reasonable opportunity to express their views on plans, programs, projects, or activities relating to waters."[43]

Without equal participation in decision making and access to the management of ecosystem services, rural communities will remain desperately poor. For example, in South Africa, land dispossession was a legacy of colonialism and apartheid; in Brazil, unequal land distribution is proving incredibly difficult to redress despite efforts taken by the government since 1995.[44] In both instances, citizens' marginalized political rights did not afford the effected people a say in the matter.[45] These examples highlight that food security policies addressing the realization of the right to food also need to take into account the socioeconomic circumstances that surround those individuals and groups whose entitlement to food is endangered. These circumstances include whether or not factors such as "democracy, the rule of law, . . . and good governance," strong governmental organization, land tenure systems, construction of property rights, rights of participation on decision making, and access to justice, exist.[46] The realization of the right to food and water depends on the rights of participation by stakeholders in decision making that affects the ecosystems in which food production takes place.[47]

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40. Aarhus Convention, *supra* note 39, art. 19(3).
41. *Id.* pmbl., art. 1.
42. Int'l Law Ass'n, *The Berlin Rules on Water Resources*, *adopted* 21 Aug. 2004, arts. 4, 17–21, 30, 69–71, *available at* http://www.cawater-info.net/library/eng/l/berlin_rules.pdf.
43. *Id.* art. 18.
44. Rome Declaration on World Food Security, FAO, Report of the World Food Summit, 13–17 Nov 1996 (WFS96/Rep) Part One, Appendix. *See also* FAO, Contemporary Thinking on Land Reforms (1998), *available at* http://www.fao.org/sd/ltdirect/ltan0037.htm
45. *Id.*
46. FAO, *supra* note 24, annex I, § II(1.2, 8.10, 7).
47. The FAO Voluntary Guidelines highlight the importance not only of including all stakeholders in access to food production and consumption but also creating an enabling

III. INTERNATIONAL ENVIRONMENTAL LAW AND THE USE OF MARKET-BASED MECHANISMS FOR PROVISIONING ECOSYSTEM SERVICES

A number of Multilateral Environmental Agreements (MEAs) include economic instruments that use market-based mechanisms as a way to implement the treaty at the national level. These instruments can generate financial resources, attract funds to environmentally friendly technologies, create employment opportunities, and encourage investments.[48] As many ecosystem services can be considered public goods, they are difficult to price, provide, and distribute equitably. Current economic instruments, including pricing and valuation of ecosystem services, can prove to be valuable tools if equity considerations inform each stage of the process. However, pricing of the services presents serious dangers as it may exclude poor people and not always reflect the damage caused to the environment.[49] In addition, valuation of ecosystem services is particularly difficult, especially valuation that takes into account the social costs of introducing market-based mechanisms for services that were previously free. Without a proper valuation method, it is difficult to prescribe the decision making process needed for resource allocation. In the case of water, valuation has proved crucial to its management and entitlements allocation. Yet, if the valuation is not correctly made, the human rights of those depending upon that particular ecosystem will suffer.[50]

Economic instruments that include pricing and valuation of ecosystem services should also include a participatory mechanism that begins by identifying all stakeholders, involving stakeholders in valuation and pricing exercises, educating all involved parties on the costs, benefits, and opportunities associated with the different possible uses of ecosystem services, and ensuring that there is equitable benefit sharing that considers the poor. Consultation via a participative process that includes all stakeholders could allocate a value and an entitlement to ecosystem services that can be transferred and traded either to other stakeholders in the same ecosystem or globally in an open market. When these steps are taken, case studies show an improvement in human well-being through sharing ecosystem services benefits.

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environment through education and widening participation whereby stakeholders can exercise choices with respect to the satisfaction of their basic rights. *Id.* Guidelines 6, 8.

48. UN Env't Programme (UNEP), Creating Pro-Poor Markets for Ecosystem Services (2005), *available at* http://www.unep.org/DEC/Support/Cross_Cutting/ProPoor.asp

49. Jona Razzaque, *Trading Water: The Human Factor*, 13 Rev. Eur. Community & Int'l Envtl. L. 24–25 (2004).

50. Valuation can be made according to several approaches: basic needs approach, human rights approach, participatory approach, or economic accounting. Rajendra Pradhan & Ruth Meinzen-Dick, *Which Rights Are Right? Water Rights, Culture and Underlying Values*, 10 Water Nepal 37 (2003).

This inclusive approach has been used in the context of river basin protection by the Canton de Pimampiro in Ecuador, where the lack of fresh water to provide for the needs of the urban population was in conflict with the needs of the owners of the forests and land from which the water supply for the urban population came.[51] Environmental protection needs, economic pressures, and domestic urban water use demands needed to be reconciled. This was successfully done by integrating all stakeholders: urban water users, landowners of the forests and surrounding land, and relevant NGOs.[52] Part of the work was devoted to a better understanding of the competing needs of the parties involved, for these parties did not have any previous relationship or understanding of the other's respective needs. A CERDENA program followed that relieved pressure from the forests by diversifying economic production away from farming and agriculture into less water intensive options, including use of medicinal plants and forests products.[53] An institutionalized framework was implemented and a unit for the protection of the environment was created at the local level. Once this was in place, the parties approved a program of hydraulic production. The parties also agreed that some of the taxes paid by the urban water users would go directly to the forest's owners. The amount of money to be paid was fixed in a way that was sustainably managed by the municipality.[54] This process shows that market-based approaches, when they have included the participation of stakeholders, have provided for some improved access to ecosystem services.

A. ENVIRONMENTAL TREATIES AND THE RIGHT TO HEALTHY ECOSYSTEMS

Similar to the human rights treaties, most environmental treaties do not explicitly mention ecosystem services.[55] However, this article argues that the

51. Esteve Corbera, Nicolas Kosov & Miguel Martinez Tuna, Marketing Ecosystem Services Through Protected Areas and Rural Communities in Meso-America: Implications for Economic Effciciency, Equity and Political Legitimacy, Working Paper 94, Tyndall Center for Climate Change Research (2006), *available at* http://www.tyndall.ac.uk/publications/working_papers/twp94.pdf.
52. Thanks to a recent land reform, the Asociación Nueva América owns about 600 hectares of land that now belongs to the local community. *See* Silvia Ortega, Resumen de Buenas Prácticas en el Foro-E de la Conferencia FAO/Países Bajos: Agua para Alimentos y Ecosistemas ¡Para que sea una Realidad!, Case study presented to the FAO Conference Water for Food and Ecosystem, 2005, The Netherlands, *available at* http://www.fao.org/ag/wfe2005/casedb_en.asp.
53. CERDENA is an NGO financed by the Inter-American Foundation whose aim is to develop techniques of conservation and provision of renewable natural resources.
54. Corbera et al., *supra* note 51, at 11.
55. However, some MEAs do mention ecosystem and adopt an ecosystem approach. Lugo, *supra* note 6, at 250.

right to life and right to a healthy environment can be extended to include the right to healthy ecosystem services.

MEAs present advantages in their ability to provide trading platforms at the international, regional, and national levels.[56] Within the various MEAs, one can identify at least four categories of ecosystem services: "carbon sequestration, water quantity and quality, biodiversity protection, and landscape beauty."[57] Markets for carbon sequestration and biodiversity fall within the scope of the 1992 UNFCCC and the 1992 CBD. Anantha Duraiappah suggests that the 1971 Ramsar Convention on Wetlands of International Importance Especially as Waterfowl Habitat and the CBD could address markets for ecosystem services on water quantity and quality, while the 1994 UN Convention Combating Desertification (UNCCD) could address markets that affect agricultural practices.[58]

These MEAs have emphasized the need for social and economic incentives to sustainably manage ecosystem services.[59] First, the CBD requires that parties "adopt economically and socially sound measures that act as incentives for the conservation and sustainable use of components of biological diversity."[60] The CBDs Conference of the Parties (COP) has addressed economic incentives and has offered recommendations on the design and implementation of incentive measures.[61] Second, the Animal Committee of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) stresses the need "to assist in the development of appropriate domestic legislation and policies that encourage the adoption and implementation of social and economic incentives allied to legal instruments that . . . [p]romote and regulate responsible trade in wild fauna and flora."[62] Third, the parties to the 1971 Ramsar Convention on Wetlands established the goal of promoting "incentive measures that encourage the application of the wise use principle, and the removal of perverse incentives."[63] To achieve this goal, a number of actions are set out, including investigating linkages

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56. Mark Paquin & Karel Mayrand, MEA-based Markets for Ecosystem Services, (OECD Workshop on Multilateral Environmental Agreements and Private Investment, Working Paper 3, Draft of Concept Paper (2005), *available at* http://www.oecd.org/dataoecd/14/62/35000276.pdf.
57. Duraiappah, *supra* note 13, at 16.
58. *Id.*
59. The UN Environment Programme's 2004 report stressed the role of market-based instruments in achieving the objectives of the MEAs. UNEP, Economic Instruments in BioDiversity-Related Multilateral Environmental Agreements 11 (2004).
60. Convention on Biological Diversity, *supra* note 14, art. 11.
61. *Id.* Decision VI/15.
62. Implementation of the Strategic Vision Through 2005, Convention on International Trade in Endangered Species of Flora and Fauna, Animals Comm., 19th mtg., (18–21 Aug. 2003), at 3, AC19 Doc. 6.1, *available at* http://www.cites.org/eng/com/AC/19/E19-06-1.pdf.
63. The Ramsar Strategic Plan 2003–2008, ¶ 8.1, Conference of the Contracting Parties to the Ramsar Convention on Wetlands, 8th mtg., (18–26 Nov. 2002), *available at* http://www.ramsar.org./key_strat_plan_2003_e.pdf

between incentives and related topics, such as financial mechanisms, trade, impact assessment, and valuation.[64]

Incentives without a clearly defined target, however, may only lead to prioritizing one service at the expense of other services and trade-offs. Thus, a strong participatory mechanism that will include poor and vulnerable communities in the decision making should be required at the national level. For example, Tradable Development Rights in the conservation of biodiversity has only worked when developed through a participatory mechanism identifying stakeholders and involving local communities in benefit sharing.[65]

B. Effectively Implementing Market Mechanisms to Promote Healthy Ecosystem Services

A common problem for developing countries is that due to the lack of institutional capacity, they cannot implement market mechanisms effectively and ensure that these work in favor of the poor communities. For market incentives and instruments to work in favor of the poor community, institutions need to ensure that mechanisms for monitoring of ecosystem health, conflict resolution, coordination between countries and stakeholders, rights allocation, and enforcement exist.[66] Lack of institutional capacity coupled with a lack of financial resources means that the necessary investment must come from private actors (including companies), donors, and rich countries.

To overcome this problem, first, there is a need for collaboration among the different types of ecosystem services. A coordinated approach could be useful given their high level of complementarities.[67] For example, a combined market for ecosystem services of water regulation, biodiversity conservation, and carbon sequestration could be developed jointly under the Ramsar Convention, the CITES, the CBD, and the UNFCCC. This could "reduce the costs of information gathering, institutional frameworks and maintenance of the market, while at the same time lowering the burden on developing countries, and work efficiently towards poverty reduction."[68]

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64. Duraiappah, *supra* note 13, at 21.
65. UNEP, Economic Instruments in BioDiversity-Related Multilateral Environmental Agreements, *supra* note 59, at 47–48.
66. UNEP, Multilateral Environmental Agreements and Pro-Poor Markets for Ecosystem Services: Discussion Paper 10 (5 Oct. 2005), *available at* http://www.unep.org/dec/docs/MEA-MES.Discussion.Paper.doc.
67. UNEP, Joint Liaison Group for the Rio Convention (Plus Ramsar), a*vailable at* http://www.unep.org/DEC/OnLineManual/Compliance/InternationalCooperation/Enhancing-SecretariatCooperation/Resource/tabid/724/Default.aspx. The Joint Liaison Group was established to improve the exchange of information between the Rio conventions to explore opportunities for synergistic activities and to increase coordination between the CBD, UNFCCC, and UNCCD.
68. Duraiappah, *supra* note 13, at 22.

Second, there is a need for flexible legal mechanisms to protect ecosystem services,[69] as some academics believe that "ecosystem services have largely been ignored in environmental law and policy."[70] While market-based approaches may not always require formal regulation, gaps in the regulation (formal or informal) may also mean that harmful activities affecting ecosystem services will not be penalized.[71] Third, in developing countries, insufficient integration of institutional, legal, or participatory mechanisms makes it difficult for developing countries to develop and manage ecosystem services. An integrated approach will more effectively help developing countries achieve MDGs, especially Goal 1 (eradicate extreme poverty and hunger) and Goal 7 (ensure environmental sustainability).[72] The institutional frameworks created in the context of MEAs should be used for the establishment and promotion of market mechanisms that are sustainable. Although MEAs are, in principle, issue-driven, there are important synergies that need to be explored and developed at the national plans.[73] In addition, procedural mechanisms that protect rights of participation need to be strengthened in order to support market mechanisms and manage ecosystem services in a sustainable manner.

Along with market-based mechanisms, there is a need for adequate regulatory structure to run the market. If carbon sequestration is an ecosystem service, then the carbon trading rules could be an example of where regulatory mechanisms provide tools and incentives to run the market.[74] Some ecosystem services have competing uses (e.g., groundwater for agricultural and commercial purposes or agricultural land and biodiversity conservation). Effective and informed participation of stakeholders, regular monitoring and evaluation, deliberative tools (neighborhood forums, focus groups, user

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69. Flexible regulatory mechanisms can take into account the different nature of resources. It can be to control the pollution generating products or to assess value of ecosystem services. Pay: Establishing Payments for Watershed Services (Mark Smith, Dolf de Groot, Danièle Perrot-Maître & Ger Bergkamp eds., 2006).
70. James Salzman, Barton H. Thompson, Jr. & Gretchen C. Daily, *Protecting Ecosystem Service: Science, Economics and Law*, 20 Stan. Envtl. L.J. 311, 312 (2001); James Salzman, *Valuing Ecosystem Services*, 24 Ecology L.Q. 887, 889 (1997). However, a number of articles consider the importance of ecosystem services in environmental law. J.B. Ruhl & R. Juge Gregg, *Integrating Ecosystem Services into Environmental Law: A Case Study of Wetlands Mitigation Banking*, 20 Stan. Envtl. L.J. 365 (2001); James Salzman & J.B. Ruhl, *Currencies and the Commodification of Environmental Law*, 53 Stan. L. Rev. 607 (2000).
71. Paquin & Mayrand, *supra* note 56.
72. The Millennium Development Goals Report, *supra* note 19, at 6, 36.
73. "For example, the Mgahinga and Bwindi Impenetrable Forest Conservation Trust in Uganda contributed to the simultaneous implementation of the CBD, the Ramsar Convention and the UNFCCC." Duraiappah, *supra* note 13, at 18.
74. Within the EU, two directives regulate the emission trading: Directive 2003/87/EC and Directive 2004/101/EC At the national level, for example, in the UK, the Greenhouse Gas Emissions Trading Scheme Regulations 2003 guides the emission trading scheme.

forums), information gathering tools (opinion polls, environmental impact assessment, participatory rural appraisal, rapid rural appraisal), and planning tools (cost benefit analysis, stakeholder decision analysis, trade offs analysis) are required to weigh options and decide between these competing uses.

Regional and national markets will also require supporting institutions to operate efficiently. Institutional failures have been identified as the main cause in ecosystem services degradation. These institutional failures are to be found both in markets and in government. Improved governance has been identified as the key component in the sustainable management of ecosystem services.[75] Institutional development that increases coordination among MEAs, enhances transparency and accountability of government in decisions affecting ecosystems services, involves communities in the decision making (e.g., forestry management, transboundary water management), and regulates interactions between market and ecosystem services (e.g., clean development mechanisms under UNFCCC) leads to sustainable management of ecosystem services. Noting the trans-boundary nature of many ecosystem services, the creation of cross-sector, cross-state stakeholder groups and of an institutional framework for their participation in the decision making is essential. How realistic this is for poor and developing countries is another matter. As Amartya Sen has remarked, "individuals live and operate in a world of institutions, many of which operate across borders. Our opportunities and prospects depend crucially on what institutions exist and how they function."[76]

IV. MARKET-BASED MECHANISMS AND THE IMPACT OF GLOBALIZATION ON ECOSYSTEM SERVICES

Globalization has been described as transformative because it reconceptualizes state sovereignty.[77] Markets and multinational corporations (MNCs) lead a selective process of global integration[78] while the conditions of the

75. Frances Irwin & Janet Ranganathan, Restoring Nature's Capital: An Action Agenda to Sustain Ecosystem Services 29 (2007), *available at* http://www.wri.org/publication/restoring-natures-capital. Here, governance includes institutions and law, and their structures and processes. It involves private and public actors and includes economic, social, and environmental dimensions of decision making processes.
76. Amartya Sen, *Global Justice: Beyond International Equity*, *in* Global Public Goods: International Cooperation in the 21st Century 116, 123 (Inge Kaul, Isabelle Grunberg & Marc A. Stern eds., 1999).
77. While "the state still defines the policies and rules for those within its jurisdiction . . . global events and international agreements are increasingly affecting its choice[s]." World Development Report, The State in a Changing World 12 (1997); Robert McCorquodale & Richard Fairbrother, *Globalization and Human Rights*, 21 Hum. Rts. Q. 735, 737 (1999).
78. Paul Guinness, Globalisation 17 (2003).

world's poorest remain a cause for serious concern.[79] The Washington Consensus, based on the privatization of institutions and public utilities, the liberalization of agricultural trade, and market-led land reforms,[80] has had catastrophic consequences for developing countries.[81] Thus, globalization and free trade, if not informed by and subjected to a discipline of human rights and accountability that ensures participation at the local level, is in violation of basic human rights.[82]

Bringing in market-based mechanisms for the provision of ecosystem services presents problems that cannot be ignored. The introduction of private actors into the supply and provisioning of these services needs to be carefully considered in light of the problems encountered by transnational public-private partnerships.[83] The dominance of multinationals in certain food sectors and in water distribution has revealed the problems associated with privatizing production and provisioning of certain ecosystem services.[84]

Access to food and water can be hindered by market interventions. An example of how global markets and competing interests can negatively affect local food markets and the right to food of local people can be seen in an example from the United States: growing of grain for biofuels in large parts of the US is said to be endangering the food security of millions of people.[85] Though market interventions have, in some cases, increased the efficiency

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79. World Investment Report 2002: Transnational Corporations and Export Competitiveness 98 (2002), *available at* http://www.unctad.org/Templates/WebFlyer.asp?intItemID=2477&lang=1, pointed out the increasing inequality in development and growth between nations. While the richest fifth income rose from 70 percent to 85 percent, the poorest global income dropped from 2.3 percent to 1.4 percent.
80. *See* John Williamson, The Washington Consensus as Policy Prescription for Development, Address Before the World Bank (13 Jan. 2004), *available at* www.iie.com/publications/papers/williamson0204.pdf.
81. Market-led reforms in Niger, for example, have had a negative impact on the right to food since privatization of the veterinary office has left peasants unable to pay vets bills and treat their cattle for illnesses. *See The Right to Food, Promotion and Protection of All Human Rights, Civil, Political, Economic, Social and Cultural Rights, Including the Right to Development, Report of the Special Rapporteur, Jean Ziegler*, U.N. GAOR, Hum. Rts. Council, 7th Sess., Agenda Item 3, at 11, U.N. Doc. A/HRC/7/5 (2008).
82. Tony Evans, *If Democracy, So Human Rights?*, 22 Third World Q. 623 (2001). *See also* McCorquodale & Fairbrother, *supra* note 77, at 737–38.
83. These problems have been outlined by Michael Likosky, Law, Infrastructure and Human Rights 170 (2006), who argued that a special Human Rights Unit (HRU) should be created within the UN to deal with the issues arising by Private-Public Participation in the context of infrastructure projects.
84. *The Right to Food, Promotion and Protection of All Human Rights*, *supra* note 81, at 11; Nils Roseman, The Human Right to Water under the Conditions of Trade Liberalisation and Privatisation: A Study on the Privatisation of Water Supply and Wastewater Disposal in Manila, Friedrich Ebert Foundation, Occasional Papers: International Development Cooperation (2003) *cited in The Right to Food, Promotion and Protection of All Human Rights*, *supra* note 81.
85. Aditya Chakrabortty, *Secret Report: Biofuel Caused Food Crisis*, Guardian, 4 July 2008, *available at* http://www.guardian.co.uk/environment/2008/jul/03/biofuels.renewableenergy.

in the production of ecosystem services, they have not necessarily improved the *rights* of access of the poor. For example, global investors may decide to grow crops for export markets. This may make economic sense, but it can reduce local peoples' access to autochthonous grain and staple foods. Water privatization provides another good example of how a "market approach" to water services has increased efficiency in the distribution of water, but it has also shown that the poor have been unable to afford access to basic water services in many cases.[86] Privatization has also left the responsibility for supplying water—and therefore, the satisfaction of a human right—to private, unaccountable actors; three companies now control the majority of water supply concessions worldwide.[87]

Similarly, MNCs also control food supplies worldwide.[88] While production patterns are being changed, small and traditional farmers are excluded from the market in favor of a pesticide intensive, export market orientated agriculture. For example, in Ghana, local tomato farmers cannot compete with cheap canned tomatoes and processed tomato products from the EU.[89] This consequence serves the profit aspirations of shareholders and feeds related industries within multinational investment groups, but it also deprives the poor of access to their livelihoods.

This type of production has shown to create violations of human rights in many areas. Workers' rights are often ignored in large scale export oriented plantations.[90] Water use is also intensified, often meaning that poor communities lose access to safe drinking water.[91] Change in crops and patterns of cultivation alter the price of basic foodstuffs in poor countries and force millions into poverty and famine.[92] Investment decisions are made

86. Roseman, *supra* note 84.
87. *The Right to Food, Promotion and Protection of All Human Rights*, *supra* note 81, at 18.
88. Just ten corporations control one third of the US commercial seed market (including Monsanto, Aventis, and Pioneer) and 80 percent of the pesticide market. Another ten corporations control 57 percent of the total sales of the main retailers and account for 37 percent of the world's sales on food and beverages. *Id.* at 17.
89. For a discussion of the issues involving problems encountered by Ghanaian farmers unable to compete with tomato imports, see Dep't of Int'l Dev., Smarter Farming Helps Developing Countries to Compete, 26 May 2006, *available at* http://www.dfid.gov.uk/Media-Room/Case-Studies/2006/Smarter-farming-helps-developing-countries-to-compete/.
90. Anup Shah, Corporations and Workers Rights, Global Issues: Social Political, Economic and Environmental Issues That Affect Us All, 28 May 2006, *available at* http://www.globalissues.org/article/57/corporations-and-workers-rights.
91. In 2006, the villagers of Plachimada (India) claimed that the bottling operations of Coca-Cola caused a severe shortage of water in the village. P.N. Venugopal, *Coca-Cola Moving Out of Plachimada?*, India Together, 27 Jan. 2006, *available at* http://www.indiatogether.org/2006/jan/env-cokesaga.htm.
92. Especially the diversion of eating crops into bio fuels. International Food Policy Research Institute (IFPRI), Bioenergy and Agriculture: Promises and Challenges (Peter Hazell & R.K. Pachauri eds., 2006); Daniel Howden, *The Fight for the World's Food*, Independent, 23 June 2007, *cited in The Right to Food, Promotion and Protection of All Human Rights*, *supra* note 81, at 21–22.

by experts in global institutions instead of the individuals, communities, or even states directly affected by the consequences of those decisions.[93] These institutions favor and fund large-scale investments (dams, irrigation projects, and roads) that in many cases not only disrupt societies, but also hinder access to natural resources and ecosystem services previously available to local communities.[94] Because human rights remain an integral part of the globalization discourse, with opportunities offered by enhanced communication networks and a stronger civil society, stronger intervention from both state governments and international agencies within the UN system is needed to curb the power of unaccountable international organizations and private bodies.[95]

In many cases, market-based globalization has not equitably distributed services essential to human well-being and decreased poverty but rather aggravated and created crises of its own. These global crises involve food, financing, energy, and the environment, and they arise out of the market's incapacity to provide those services that are essential to human well-being. Compensation schemes, taxes, subsidies, tradable development rights, and carbon sequestration rights are market-based mechanisms that can compensate for market failures in valuing ecosystem services. If services are not valued adequately and if environmental and social externalities are not reflected in market price, there is a possibility that the market mechanisms will not work sustainably.

Providing value to ecosystem services through market-based mechanisms does hold promise, but ensuring that the poor are included in these mechanisms must be a priority in any potential and future regulation at the national, local, and international level. The poor are the most vulnerable of all groups to the diminution of ecosystem services. They usually depend upon these services for their immediate survival, while, at the same time, lack any institutional security in the form of rights or licenses that guarantee access to the services.[96] Any market or other non-market mechanism must acknowledge the fact that the poor cannot be priced out of the use of ecosystem services that they require for survival and to which they had free

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93. McCorquodale & Fairbrother, *supra* note 77, at 738.
94. The World Bank has recognized that "[s]ocial disruption is inevitable in large scale irrigation projects. . . . Local people often find that they have less access to water, land and vegetation resources as a result of the projec[t]." The World Bank, Technical Paper No. 140, 2 Environmental Assessment Sourcebook 96, n.140 (1991), *cited in* McCorquodale & Fairbrother, *supra* note 77, at 743.
95. Mary Robinson, Globalisation and Human Rights, 21st Century Trust Seminar on Globalisation: Rhetoric, Reality and International Politics, Address before Congress (31 Oct. 2003), *available at* http://www.21stcenturytrust.org/Robinson.pdf; *The Right to Food, Promotion and Protection of All Human Rights*, *supra* note 81, at 18–19.
96. *See* OECD, Managing the environment. The role of economic instruments (1994) *cited in* Duraiappah, *supra* note 13, at 4.

access in the past.[97] It is important that government intervention ensures that the introduction of market instruments is accompanied by the introduction of opportunities for the poor.[98]

V. EQUITABLE ACCESS TO ECOSYSTEM SERVICES, PROPERTY RIGHTS, AND THE ROLE OF LAW

A constitutional protection of the right to food and water can be the starting point of a process that creates a legal environment in which such right can become effective.[99] For example, the Indian Supreme Court has recognized that the right to food and the right to water flow from the right to life guaranteed in Article 21 of the Indian Constitution.[100] These constitutional provisions, however, have to be supported by effective participatory rights to information, enforceable equity rights, and legal redress. In addition, justiciability, together with conditions for effective access to courts, including legal representation and the existence of suitable administrative and judicial procedures, are as important as constitutional recognition.[101]

A. Participatory Rights and Competing Interests

The degradation of ecosystem services has been identified as a significant barrier to achieving the MDG.[102] The MA has found, with regard to access

97. An example of this is provided by the creation of some national parks and nature reserves in Africa. When the park has been established with no consultation with the local people and they are excluded from benefit sharing, the degradation of the area that was to be protected actually increases as those forced out need to trespass to access what they could access before in a legitimate way. If consultation and benefit sharing are implemented these tensions are greatly reduced. Millennium Ecosystem Assessment, *supra* note 1, at 621.
98. *Id.*
99. Today twenty three countries recognize the right to food in their constitutional texts, seven make an explicit reference and ten as a principle of state policy. Food and Agricultural Organization of the United Nations, The Right to Food: In Theory and in Practice 43–4, (1998), *available at* http://www.fao.org/legal/rtf/booklet.pdf. The Constitution of the Republic of South Africa, § 27(1)(b) guarantees the right of everyone to have access to sufficient food and water. S. Afr. Const. §27(1)(b). For examples from other national constitutions, see Malcom Langford et al., Legal Resources for the Right to Water: International and National Standards 45 (Centre on Housing Rights and Evictions 2003), *available at* http://www.cohre.org/store/attachments/COHRE%20Sources%208.pdf.
100. PUCL v. Union of India, Writ Petition (C) No. 196 (2001), *available at* http://www.pucl.org/reports/Rajasthan/2001/starvation-writ.htm. *See also* Court Order, *available at* http://www.hrln.org/issue.php?id=14&pil=1&pilid=18. Charan Lal Sahu v. Union of India 1990 A.I.R. 1480, 1495, *available at* http://indiankanoon.org/doc/299215/; Hussain v. Union of India 1990 A.I.R. 321 (Kerala) 340; Razzaque, *supra* note 49, at 21.
101. Upendra Baxi, *Taking Suffering Seriously; Social Litigation in the Supreme Court of India*, *in* Law and Poverty: Critical Essays 387 (Upendra Baxi ed.,1988).
102. Millennium Development Goals, *available at* http://www.un.org/millenniumgoals/.

to ecosystem services, that there is a growing inequity and disparity among groups of people.[103] The degradation of ecosystems has a more direct impact and a greater effect upon the world's poorest people and is often the main factor contributing to poverty. The poor, women, and indigenous communities are the most affected by externalities, such as adverse climatic conditions and the destruction or unavailability of ecosystem services. At the same time, these same marginalized communities are traditionally excluded from participation in decision making and from policies of empowerment with respect to ownership and access to natural resources and ecosystem services.[104] As a consequence, they have little or no control over the processes resulting in destruction of ecosystem services or changes in use.

The fact that 60 percent of all ecosystem services are being degraded or used unsustainably underscores that conflicting interests are affecting ecosystem services.[105] In most cases, this degradation and unsustainable use takes place in order to increase the supply of other ecosystem services; for example, turning forest into agricultural land for crops disrupts water flows and creates climate externalities.

Efforts to identify a system that takes into account these competing interests, equity considerations, and inclusiveness of stakeholders must depart from the premise of scarcity. This is crucial in the contexts of both food and water as public goods and in an ecosystem context. In addition, individuals or groups will only willingly participate in a system that they perceive as fair. Equity encourages the cooperative behavior necessary to achieve decisions and compromises in the production, management, and enjoyment of public goods and is also essential at the organizational level to encourage participation.[106] As discussed in Part II, participation in environmental decision making is a complex area. It includes determination of interested and affected parties and their inclusion in a deliberative process.[107] If stakeholders become the starting point of discussion, awareness and compromise can be fostered which in turn enables prioritization and understanding of competing needs, such as biofuel versus food and drinking water versus water for commercial agricultural use.

Tropical forests are an example of an ecosystem that attracts internal claims as well as external actors with respect to its management, highlighting

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103. Millennium Ecosystem Assessment, *supra* note 1, at 12.
104. Jona Razzaque, *Implementing International Procedural Rights and Obligations: Serving the Environment and Poor Communities*, *in* How to Make Poverty History—The Central Role of Local Organizations in Meeting the MDGs 175 (Tom Bigg & David Satterthwaite eds., 2005)
105. Millennium Ecosystem Assessment, *supra* note 1, at iii.
106. Mohan Rao, *Equity in a Global Public Goods Framework*, *in* Global Public Goods, *supra* note 76, at 68, 70.
107. Jenny Steele, *Participation and Deliberation in Environmental Law: Exploring and Problem-Solving Approach*, 21 Oxford J. Legal Stud. 415, 437–38 (2001).

that competing parties need tropical forests for survival. Tropical forests have a public good dimension because they produce international externalities as a result of their exploitation.[108] Tropical forests are an important source of wood for fuel and food and shelter for local communities. Yet, they also serve as carbon sinks and biodiversity reserves for the world at large. Their management is subject to competing claims from environmentalists, the timber industry, and local communities that depend on forest products for their survival.[109] Concepts such as sustainable forest management (SFM) and, more recently, the introduction of market instruments have been presented to try to integrate these competing claims and concerns.

According to critics, the problem with SFM and the introduction of market instruments is that they tend to move away from human rights principles and fail to provide for those who are most vulnerable and directly dependent on the resources, despite efforts made by the proponents to include local communities.[110] The lack of tenure rights for the forest dependent poor is the main obstacle in improving forest governance.[111] No market-based instrument and no global trading platform can improve ecosystem management if the basic problem of rights allocation is not addressed by national governments.

B. Property Rights and Access to Ecosystem Services

As discussed in Parts III and IV, market instruments can provide a useful tool in the management of natural resources and in the provisions of ecosystem services only if they are integrated within a wider strategy of institutional development, rights allocation, and environmental awareness and education. In general, markets are regulated by the principle of supply and demand and by the user pays principle. However, in addressing ecosystem services, it is difficult to assign a price because to these services some of them are public goods and there is a lack of individual property rights.[112] Provisioning

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108. Tropical forests play an important role in carbon sequestration, biodiversity conservation, prevention of deforestation and desertification. *See* Adrian Wells, Cecilia Luttrell & David Brown, *Public Goods and Private Rights: The Illegal Logging Debate and the Rights of the Poor*, 9 Forestry Briefing (2006), *available at* http://www.odi.org.uk/resources/download/542.pdf.
109. J. Peter Brosius, *Endangered Forests, Endangered People: Environmentalist Representations of Indigenous Knowledge*, 25 Hum. Ecology 47 (1997).
110. Wells et al., *supra* note 108, at 2–3.
111. "Forest governance pertains to how decisions related to forests and forest dependent people are made, who are responsible, how they wield their power, and how they are held accountable. It encompasses decision-making processes and institutions at local, national, regional and global level." Center for International Forestry Research, Forest and Governance Programme, *available at* http://www.cifor.cgiar.org/Research/Governance.
112. It has been argued that for services to be bought and sold, these must have well defined property rights that facilitate the exchange. *See* Environmental Economics: Policies for Environmental Management and Sustainable Development 192 (C.A. Tisdell ed., 1993), *cited in* Duraiappah, *supra* note 13, at 5.

ecosystem services, such as forestry products, timber, agricultural products, and water, are easier to allocate in terms of private property rights. However, the use of provisioning ecosystem services has an impact on the regulating, supporting, and cultural services. Therefore, private property rights may not take these into account, and by themselves, they may not provide the most efficient mechanism of protection, allocation, and enjoyment. In fact, the decline in the production of supporting, and cultural services is sometimes blamed on the allocation of private property rights in provisioning ecosystem services to individuals and, mostly to companies.[113]

Sustainable use must be incorporated into property rights because economic theory indicates that once property rights are allocated over a resource, the owner will use that resource in a way that provides for higher utility.[114] This higher utility may not necessarily mean higher sustainability or equitable use of the resource. Therefore, government oversight is crucial to maintain the fairness, equity, and sustainability of the allocation of resources. Markets fail when they do not lead toward a social optimum because they either fail to allocate the correct price for environmental adverse effects, or monopolies dominate and distort the existing market.[115] In the case of some ecosystem services, like food and water, their public good characteristics make it nearly impossible for a market to emerge without government intervention. It is also dangerous to do so without safeguards. Clearly defined property rights, collective rights, and user rights are essential to monitor the resources and ensure that poor and vulnerable communities do not become alienated from ecosystem services that they previously accessed for free. Supporting domestic policies and laws are also required to ensure the transparent functioning of the market in ecosystem services.[116]

A recent study on ecosystem services found that provisioning ecosystem services actually helped wealthy farmers with large forested areas and failed to help poor landowners due to, inter alia, weak institutional design and weak community-based organizations.[117] For a project to be successful, it is necessary to not only introduce market instruments, but also to introduce a range of educational and capacity building options whereby the beneficiaries can really engage in ecosystem use and enjoyment.[118]

For effective implementation of rights to food or water, legal mechanisms as well as a supporting institutional legal framework are required for disadvantaged communities. This institutional legal support must be able to first,

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113. *Id.* at 13.
114. *Id.* at 20.
115. OECD, Managing the Environment: The Role of Economic Instruments (1994), *cited in* Duraiappah, *supra* note 13, at 4.
116. Marcus Moench, *Searching for Balance: Water Rights, Human Rights and Water Ethics*, 10 Water Nepal 165 (2003).
117. Corbera et al., *supra* note 51.
118. Irwin & Ranganathan, *supra* note 75.

educate the rights holders as to their entitlements, and second, be able to enforce their rights against sometimes forceful opposition from other groups in society. In many developing countries, there is no existing infrastructure to support rights allocation, nor are there any resources available to create educational awareness and a culture of equality and non-discrimination. Rights that do not acknowledge the social situation in which they have to operate become empty declarations that perpetuate the status quo.

A key component in the success of the market instruments is the ability of the poor who rely on the ecosystems to exercise legal rights.[119] Defining property rights is crucial because it identifies the resource users and enables equitable allocation of resources. In order to make market instruments more equitable and sustainable, the "property rights must provide for more than the regulation of land ownership and include the natural resources that the land provides."[120] Without a clearly defined, formal, or customary property right, any market instrument will only attract a large number of resource users, subsequently leading to overexploitation of that particular ecosystem service.[121]

In situations of scarcity of resources, property institutions play a crucial role due to their dual function of "use control and wealth allocation."[122] In most cases, property rights have played a decisive role in determining whether communities would be involved in proposed conservation and environmental projects. Property rights, including not only ownership, but use and access rights have also been a factor in facilitating the distribution of benefits.[123] The existence of property rights, or their creation, for example, by land reform, whereby local communities are given ownership of land previously owned by the public authorities, seems to create added incentives in ecosystem services management.[124]

Land tenure is a crucial factor in obtaining food security. Insecure tenure is linked to poor land use which, in turn, creates environmental degradation and poverty, as there are no incentives for those using the land to invest in long term, sustainable agricultural or extractive practices.[125] A system of land tenure that acknowledges different layers of use, access, control, and

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119. Corbera et al., *supra* note 51, at 11.
120. Pay, *supra* note 69, at 76.
121. *Id.* at 75.
122. *See* James W. Harris, Property and Justice 23 (1996).
123. Thanks to a recent land reform, the Asociacion Nueva America owns about 600 hectares of land that now belong to the local community. *See* Silvia Ortega, Resumen de Buenas Prácticas en el Foro-E de la Conferencia FAO/Países Bajos: Agua para Alimentos y Ecosistemas ¡Para que sea una Realidad!, CARE, Ecuador, Case Study presented to the FAO Conference Water for Food and Ecosystems,(2005), *available at* http://www.fao.org/ag/wfe2005/casedb_en.asp
124. *Id.*
125. FAO, Report on Land Tenure and Rural Development (2002), *available at* http://www.fao.org/DOCREP/005/Y4307E/y4307e00.htm. In the forest sector, the long production cycles accentuate the importance of the tenurial regime. Wells et al., *supra* note 108, at 1.

ownership and accommodates both traditional indigenous systems of land tenure alongside modern property rights is the starting point in the process of recognition and inclusion of stakeholders in decisions pertaining to land and related resources. Whereas allocation of rights is to be welcomed, in many communities, the allocation of rights is influenced by discrimination based on gender,[126] ethnicity,[127] or religion. This discrimination is often at the root of the current causes of destitution of certain individuals and groups, and rights systems need to address this structural and endemic problem when allocating rights and entitlements. This may, in many cases, conflict with traditional systems of land tenure.[128] The allocation of community rights and multiple layer rights, such as use rights, access rights, ownership rights, and control rights, has not been without difficulties. Tensions have often arisen between the state and indigenous peoples in the context of demarcation and titling of indigenous land.[129] Indigenous land tenure is based on a communitarian concept of stewardship of the land and does not easily fit within either the Roman or common law concepts of land ownership.[130] The challenge remains to devise land tenure systems flexible enough to accommodate tenure and access rights, entitlements, and legitimate aspirations of all stakeholders, including indigenous peoples.

C. The Public Trust Doctrine

The allocation of private property rights over ecosystem services is both difficult and controversial. It is difficult because ecosystem services are, in many cases, public goods and as such, should remain outside the sphere of private ownership: "The presence of ecosystem processes and services beneficial to

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126. Women head 30 percent of rural households but own less than 2 percent of all land. Lack of inheritance rights and a variety of obstacles to purchase, management and ownership of land remain despite international instruments and national declarations of gender equality in many constitutional texts. FAO, Women's Right to Land: A Human Right (2002), *available at* http://www.fao.org/news/2002/020302_e.html.
127. Indigenous peoples also face considerable obstacles to land tenure and enjoyment despite the UN Declaration on the Rights of Indigenous Peoples (2007) stating the right of indigenous peoples to their lands (art 8.1(b)) and to choose a livelihood according to their traditional culture and the duty of States to consult with and respect the decisions of indigenous peoples in respect of their lands, territories and resources.
128. It can, for example, exclude women or certain ethnic groups from secure access, see FAO, Report on Land Tenure and Rural Development, *supra* note 125, at 4.10–4.17.
129. The Indigenous Mayagna Community of Awas Tingni, North Atlantic Autonomous Region, Nicaragua filed a petition against the government of Nicaragua to the Inter-American Commission of Human Rights for protection against the violation of their right to judicial protection and of land and resources rights according to the constitution and national legislation. The community had previously failed in its attempts to demarcate the lands following the logging concession. The petition was upheld by the Inter-American Court of Human Rights.
130. Kevin Gray, *Property in Thin Air*, 50 Cambridge L.J. 252 (1991).

humans, coupled with equity and no-harm principles, places limits on the extent to which property claims especially to areas that have not undergone physical transformation due to human labour, are justified."[131] Allocation of property rights is controversial because it creates a dynamic of inclusion and exclusion, whereby the poor and vulnerable may be at further risk.[132] Private property rights need an institutional mechanism of enforcement in which control over use and exclusion of trespassers can be articulated.

Examples of this are provided by land reform programs that allocate rights to indigenous or local communities.[133] In recent years, in the absence of a regulatory framework to protect ecosystem services such as agricultural land and water, there has been an attempt to use the public trust doctrine, albeit in a limited manner.[134] The public trust doctrine serves two purposes: it mandates affirmative state action for effective management of resources, and it empowers the citizens to question ineffective management of natural resources.[135] It is a common law concept and is defined and addressed by numerous academics in the United States and the United Kingdom.[136] To its proponents, common properties, including rivers, the seashore, and the air, should be held by the government in trusteeship for the uninterrupted use of the public.[137] The government could not, therefore, transfer public trust properties to a private party if the grant would interfere with the public interest.[138] The scope of this doctrine is still uncertain and has received criti-

131. Brent M. Haddad, *Property Rights, Ecosystem Management, and John Locke's Labor Theory of Ownership*, 46 Ecological Econ. 9 (2003).
132. The power of exclusion is, according to Gray, the most significant characteristic of individual property rights. Gray, *supra* note 130, at 252.
133. Several Latin American countries (e.g. Guatemala, Bolivia, Ecuador, Nicaragua, and Colombia) have engaged in a land reform program involving the recognition of land rights of indigenous communities.
134. In a Sri Lankan case concerning the Eppawela Phosphate Mining Project, the Supreme Court applied the public trust doctrine to protect agricultural lands, and prevent the forced relocation of residents in Sri Lanka's North Central Province. Bulankulama v. The Secretary, Ministry of Industrial Development, 7 S. Asian Envtl. L. Rep. 1 (2000).
135. Carol M. Rose, *Joseph Sax and the Idea of the Public Trust*, 25 Ecology L.Q. 351 (1998).
136. Carol M. Rose, *The Comedy of the Commons: Custom, Commerce, and Inherently Public Property*, 53 U. Chi. L. Rev. 711(1986); Joseph L. Sax, *The Public Trust Doctrine in Natural Resource Law: Effective Judicial Intervention*, 68 Mich. L. Rev. 471 (1970); Jan S. Stevens, *The Public Trust: A Sovereign's Ancient Prerogative Becomes the People's Environmental Right*, 14 U. Cal. Davis L. Rev. 195 (1980).
137. Joseph Sax, Defending the Environment: A Strategy for Citizen Action (1970). According to Sax, because certain natural resources such as air and water are important to the citizens as a whole, private ownership of such resources are unwise. In his opinion, the government should advance the general public interest instead of redistributing public resources for private gain.
138. Alison Rieser, *Ecological Preservation as a Public Property Right: An Emerging Doctrine in Search of a Theory*, 15 Harv. Envtl. L. Rev. 393 (1991).

cism.[139] However, attempts have been made to apply this doctrine to protect navigable and non-navigable waters, parks, and ecological resources, and also to apply it to both private and public lands.[140]

In India, public trust, as a common law doctrine, has been applied in several public interest litigations.[141] Its successful application in India shows that this doctrine can be used to remove difficulties in resolving tribal land disputes and cases concerning development projects planned by the government affecting the local community. In *M.C. Mehta v. Kamal Nath*, the Supreme Court stated that the public trust doctrine primarily rests on the principle that certain resources like air, sea, waters, and the forests have such a great importance to the people as a whole that it would be unjustified to make them a subject of private ownership.[142] The Court also stated that the public trust doctrine should be applied even if there is no legislation to protect the natural resources.[143]

While protection of ecosystems and related services were not the main theme of the public trust doctrine, legal cases in both developed and developing countries show that the public trust doctrine is being used to manage natural resources.[144] Developing on that experience, Ruhl and Salzman attempt to link ecosystem services and natural capital to the public trust doctrine:

> [T]raditional public trust resources often contain natural capital supplying economically valuable ecosystem services to the public; the public's enjoyment of those values is appropriately treated as a use of the trust lands within the meaning of the public trust doctrine; therefore, the restrictions applicable under the public trust doctrine attach to the natural capital found on trust lands.[145]

Thus, if the public trust doctrine protects natural capital (forests, wetlands, fish habitat), ecosystem services flowing from these natural capitals can also

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139. Examples of the cases can be found in David V. Zwaag, *The Concept and Principles of Sustainable Development: "Rio Formulating" Common Law Doctrines and Environmental Laws*, 13 Windsor Y.B. Access to Just. 39, 62–64 (1993). It is argued that public trust doctrine does not give specific guidance to courts. Steven M. Jawetz, *The Public Trust Totem in Public Land Law: Ineffective—and Undesirable—Judicial Intervention*, 10 Ecology L.Q. 455 (1982). Huffman argues that public trust doctrine affects private property rights and is used as an effort to evade just compensation. James L. Huffman, *A Fish out of Water: The Public Trust Doctrine in a Constitutional Democracy*, 19 Envtl. L. 527 (1989).
140. Jona Razzaque, *Case Law Analysis: Application of Public Trust Doctrine in Indian Environmental Cases*, 13 J. Envtl. L. 221–34 (2001).
141. David Takacs, *The Public Trust Doctrine, Environmental Human Rights, and the Future of Private Property*, 16 N.Y.U. Envtl. L.J. 735–40 (2008).
142. (1997) 1 Supreme Court Cases 388.
143. *Id.* ¶ 35.
144. Erin Ryan, *Public Trust and Distrust: The Theoretical Implications of the Public Trust Doctrine for Natural Resources Management*, 31 Envtl. L. 477, at 490 (2001).
145. J.B. Ruhl & James E. Salzman, E*cosystem Services and the Public Trust Doctrine: Working Change from Within*, 15 Se. Envtl. L.J. 223, 232 (2006).

be protected by the doctrine.[146] Some fear, however, that if all ecosystem services are only economically valued, economic uses may be more valuable than their ecological value, for example, fishing and navigation.[147]

VI. CONCLUDING REMARKS

In a world that produces enough food to feed up to 12 billion people, 6 million children under five die annually of malnutrition and related diseases.[148] Despite the universally accepted human right to live in dignity and to be free from hunger, UN agencies seem unable to coordinate their work to ensure the satisfaction of the most basic rights for human survival. Inconsistency between the declarations of many UN agencies, including the FAO and Human Rights Committees, and the trade policies promoted by other agencies undermine any progress that has been made in attaining the now unreachable first goal of the MDG to eradicate extreme poverty and hunger.[149] Similarly, while states endorse principles and policies that recognize the right to food (most states have ratified both the ICCPR and the ICSECR), they continue to support trade policies that weaken these declarations and rights.[150]

The management of ecosystem services is fragmented across agencies. Any existing institution at both the global and the national level has the mandate to address the degradation of ecosystem services but, in doing so, faces a variety of challenges related to the need for greater cooperation across sectors and the need for coordinated responses at multiple levels. As for water, the tension between equity and productive efficiency is epitomized by the human rights versus commoditization equation. While several global institutions have potential quasi legislative and governance powers over water, their mandates do not necessarily include or take into account international human rights commitments or constitutional declarations.[151] Individual states are then left to temper the negative consequences of private global water provisions by rights protection systems, such as constitutional provisions or access to justice by affected communities. This, of course, is not the case in all developing states.

146. *Id.* at 230.
147. *Id.* at 237.
148. *The Right to Food, Promotion and Protection of All Human Rights, supra* note 81, at 2.
149. Especially the World Bank, the International Monetary Fund, and the World Trade Organization. *Id.*
150. *Id.*
151. Bronwen Morgan, *Emerging Global Water Welfarism: Access to Water, Unruly Consumers and Transnational Governance, in* Consumer Cultures, Global Perspectives: Historical Trajectories, Transnational Exchanges 279, 284–85 (John Brewer & Frank Trentmann eds., 2006).

Moreover, at the national level, the government agencies do not always follow a coordinated approach to sustainably manage the ecosystem services, such as watershed services. For example, in order to designate an area as a protected area, government agencies may need to take into account the following: land tenure system, including ownership, grazing rights, and customary rights; environmental regulation, including biodiversity and environmental impact assessment; existing intellectual property rights; human rights obligations; priorities under MEA, such as UNFCCC and CITES; national development policies, including a Poverty Reduction Strategy Paper; and other national policies, such as national water policy and national energy policy. However, this type of coordination among government agencies is unlikely due to time, financial, and manpower constraints.

Local people often lack rights concerning the ecosystem services upon which they depend for their livelihoods. This is especially true in developing countries where either the government or a small land holding elite often owns much of the land. Moreover, those that degrade ecosystem services do not always pay. Even if people are aware of the services provided by an ecosystem, they are neither compensated for providing these services nor penalized for reducing them. In addition, the people harmed by the degradation of ecosystem services are often not the ones who benefit from the actions leading to the degradation of the ecosystem services, and as a consequence, those costs are not factored into management decisions.

A well-defined land tenure system, flexible enough to accommodate different layers of ownership and use, is necessary for sustainable management of ecosystem services. Issues of ownership along with access to resources, rights to participation in decision making, and regulation of ecosystem services can strongly influence the sustainability of ecosystem management.

For the developing countries of Asia, Africa, and Latin America, the effectiveness of participatory mechanisms, including consultation at the policy and project making level, and access to information, including the availability of information from the government agencies or private sectors and the cost of this information, depends on the quality of national law or guidelines. Only a strong participatory regime can lead to a high-quality decision and enable the participating communities to hold the public authority or the private sector accountable for the decisions concerning resource use. International instruments, such as UNECE or UNITAR that emphasize participation need to provide support structures for capacity building in developing countries.[152]

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152. The Aarhus Convention emphasized the need for capacity building to increase compliance in developing countries in the first meeting of the Parties to the Convention (Lucca, 2002) and has devoted much time and effort to ensure that the economies in transition of Central Asia.

Along with strong institutional and legal mechanisms that ensure the protection of vulnerable groups, there is a need to have a responsive and proactive judiciary at the national level. Access to courts needs to be affordable and the jurisdiction needs to be as broad as possible to allow affected communities and NGOs to bring actions.[153] At the international level, the adoption of an Optional Protocol to the ICESCR is a welcome addition to the justiciability of rights to ecosystem services.[154] It should both improve countries' compliance with their obligations under the ICESCR beyond the vague reporting obligations currently in force, and, in addition, provide individuals with a mechanism of redress in the case of violation of rights. Moreover, stronger NGO groups that can unite in their demands beyond the structure of state and inter-state power relations may aid the development of a borderless market where public goods can be priced and traded and may also ensure the ultimate protection for the provision of ecosystem services.[155]

The MA has considered a series of effective responses to address the barriers related to the management of ecosystem services at the international and national level.[156] It is true that the ecosystem approach is broader than only species or habitat conservation, and in recent years, a number of international regulations are dealing with the sustainable management of transboundary resources.[157] However, the equitable access and sustainable management of ecosystems will largely depend on the national legal and institutional framework. In order for the ecosystem services to be people friendly (and not purely be an economic notion), the values integrated into the human rights regime should be embedded in the *services* definition. While the anthropocentric foundation of human rights may endanger the sustainable management of those same ecosystems that are essential for human survival, a rights-based approach is useful for assigning responsibilities, duties, and obligations as well as distributing benefits among different actors involved. Market-based instruments offer the potential for better ecosystem management but present dangers and social costs unless carefully implemented and monitored inside an equitable and participatory system inclusive of different types of actors.

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153. Jona Razzaque, *Participatory Rights in Natural Resource Management: The Role of Communities in South Asia, in* Environmental Law and Justice in Context 117 (Jonas Ebbesson & Phoebe Okowa eds., 2008).
154. Optional Protocol to the International Covenant on Economic, Social and Cultural Rights, *adopted* 10 Dec. 2008, G.A. Res. 63/117, U.N. GAOR, 63d Sess., 66th plenary mtg., U.N. Doc. A/RES/63/117 (2009).
155. Sen, *supra* note 76, at 123.
156. Millennium Ecosystem Assessment, *supra* note 1, at 20.
157. For example, 1998 UNECE Aarhus Convention, UNECE Convention on Environmental Impact Assessment in a Transboundary Context (Espoo 1991), 2000 EU Water Framework Directive (2000/60/EC). At the international level, transboundary management of ecosystem services is still under-developed.

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