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Asian Traditions and Contemporary International Law on the Management of Natural Resources

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In the 1997 decision of the International Court of Justice in the dispute between Hungary and Slovakia regarding the uses of the Danube, Judge Weeramantry invoked ancient Asian traditions concerning the utilization of shared water resources to offer novel insights for the development of international law. In searching for inspiration for the concept of sustainable development in international environmental law, Judge Weeramantry examined the ancient irrigation-based civilization of his country, Sri Lanka, as well as early systems in other Asian societies. Asian traditions reflect numerous examples for fruitful cooperation in the management of shared natural resources, in diverse areas such as Cambodia, China, India, Indonesia and Iran, and the Middle East. Local social norms, shared culture and even religion have been utilized for sustaining long-term equitable utilization of shared watercourses. Many of the irrigation systems, including the social arrangements that supported them, survive to this day. In later periods, under the influence of Western scientists who showed no reverence to "primitive" practices, many Asian governments upset the delicate indigenous systems by imposing centrally planned, unsustainable management systems. Contemporary scientists and disillusioned governments are now rediscovering those ancient practices and are trying to reinstate them where possible. This paper describes these traditional irrigation practices and analyses the logic of collective action that sustains them. The insights of this exercise are then used to examine contemporary issues related to the management of freshwater resources in Asia, including the Indus, the Ganges and the Mekong rivers. The basic argument is that the shared Asian traditions, which also are reflected in contemporary international law, can and should serve as guidance in the management of the region's many shared resources.

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In the 1997 decision of the International Court of Justice in the dispute between Hungary and Slovakia regarding the uses of the Danube, Judge Weeramantry invoked ancient Asian traditions concerning the utilization of shared water resources to offer novel insights for the development of international law. In searching for inspiration for the concept of sustainable development in international environmental law, Judge Weeramantry examined the ancient irrigation-based civilization of his country, Sri Lanka, as well as early systems in other Asian societies. Asian traditions reflect numerous examples for fruitful cooperation in the management of shared natural resources, in diverse areas such as Cambodia, China, India, Indonesia and Iran, and the Middle East. Local social norms, shared culture and even religion have been utilized for sustaining long-term equitable utilization of shared watercourses. Many of the irrigation systems, including the social arrangements that supported them, survive to this day. In later periods, under the influence of Western scientists who showed no reverence to "primitive" practices, many Asian governments upset the delicate indigenous systems by imposing centrally planned, unsustainable management systems. Contemporary scientists and disillusioned governments are now rediscovering those ancient practices and are trying to reinstate them where possible. This paper describes these traditional irrigation practices and analyses the logic of collective action that sustains them. The insights of this exercise are then used to examine contemporary issues related to the management of freshwater resources in Asia, including the Indus, the Ganges and the Mekong rivers. The basic argument is that the shared Asian traditions, which also are reflected in contemporary international law, can and should serve as guidance in the management of the region's many shared resources.

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I. Introduction

1. Dating back three millennia, Asian traditions have sustained impressive instances of efficient and sustainable management of freshwater resources. These traditions were designed to provide villagers with collective mechanisms for the shared management of small springs, aquifers and floods. In contrast, the emergence of the modern State towards the end of the second millennium would have produced similar successful arrangements on a regional or even national scale. But many of these governments have failed to do so and, instead, have caused much dissipation and ruin of natural resources. The picture is similar in other parts of the world: efficient small-scale water management institutions have been replaced by larger, inefficient and often corrupt systems with consequential loss and even human suffering.

2. Nowadays, the management of freshwater and other shared natural resources often involves not only national decision-making but also international cooperation. Many rivers are shared by two or more countries. The Ganges, the Indus and the Mekong are only three examples of transboundary natural resources in Asia whose management could benefit from coordination among the riparian States. In the light of competing demands by riparian States, international law is called upon to provide responses to these challenges. At this crucial juncture, these ancient Asian traditions can inform decision-makers as to the management of specific treaty regimes as well as the evolution of international law in general. National courts engaged in reviewing policies related to the management of internal resources and international courts resolving international conflicts can benefit from a close look at past solutions.

II. Asian traditions on water management

3. It was dependence on water that gave birth to many societies. The reliance on shared freshwater resources was so crucial for human subsistence in many parts of Asia that the collective effort to manage water became the bond that transformed individuals and families into social groups. Communities in arid and semi-arid areas had to coordinate activities to procure sufficient water to feed their families and cattle and to irrigate their fields. In other areas, where water was abundant, cooperation was necessary to prevent flooding. Through endogenous cooperation, it was possible to tame and enjoy communal resources. The design of sophisticated engineering projects could not have been sustained without equally sophisticated social, political and legal designs. No well would be dug unless its water could be protected under a well-defined set of rules of either individual or collective ownership. When the procurement of water required efforts beyond the capabilities of a single peasant, systems of common decision-making and monitoring were set up collectively to procure and apportion the shared resource.

4. The first story of successful cooperation is reported in the Biblical tale of the meeting between Jacob and Rachel. A heavy stone covered the collective well that served the herds of all the villagers. Removing the stone required the joint effort of all the shepherds, but Jacob, in a show of extraordinary strength, managed to remove the stone single-handedly while trying to impress Rachel.¹ The heavy stone was a simple device that enabled collective monitoring of the timing and quantity of use, as well as assignment of responsibility for accidental pollution.

5. The Middle East is replete with many similar examples, all based on the idea of a community-owned resource. One such example, which still functions, was developed in the ninth or eighth century BC. It involves a communal spring or system of springs. The villagers dug tunnels deep into the rock to drain the saturated aquifer more efficiently and increase the flow of these springs.² They based the complicated digging and maintenance of the spring flow tunnels and the distribution of the water thus obtained on the idea of the spring as a shared resource. A similar arrangement, which also emerged without the backing of a central government, developed through local customs in the ancient Persian kingdoms. Since the eighth century BC, farmers have irrigated their fields by groundwater flowing from qanawat (tunnels dug into the underground water table below riverbeds), which sometimes reached a length of more than 50 kilometres.³ There is ample evidence that qanawat were satisfactorily operated, sometimes supplying more than 100 users.

6. Collective action required investment not only in infrastructure, but also in collective decision-making processes and enforcement mechanisms. In some communities, these functions depended heavily on family ties. The villagers in the Judean Hills in Palestine, for example, relied heavily on the structure of the hammulah, the extended family. Only a small number of hammulahs resided in each village, and water would rotate between the hammulahs on a weekly basis. At night, the spring water filled a publicly owned pool. Then, during the daytime, the water that had accumulated in the pool would be redirected to the fields, each day supplying water to the members of one hammulah. An elder of the hammulah would be in charge of the actual diversion. Zvi Ron described in detail the water system in Battir, an Arab village in the West Bank in the vicinity of Jerusalem, which, in 1967, still relied on the ancient spring flow allocation system.⁴ Eight hammulahs lived in Battir, and hence, each hammulah would get water for its families every eighth day. An elder of the hammulah was in charge of distribution among the families of the hammulah and among the family members within each family. With a wooden stick that was notched with as many notches as there were water recipients, he would measure the decreasing water

3 A.K.S. Lambton, Qanat, IV Encyclopedia of Islam, 529-531; Peter Beaumont, The Qanat: A Means of Water Provision from Groundwater Sources, in: Peter Beaumont (ed.), Qanat, n. 2, 13-31, p. 23.

4 Zvi Y.D. Ron, Development and Management of Irrigation Systems in Mountain Regions of the Holy Land, 10 Trans. Inst. Br. Geogr. N. S. (1985), 149–169; Zvi Y.D. Ron, Battir—The Village and the System of Irrigated Terraces, 10 Teva va-Arets (1968), 112, 121 (in Hebrew).

¹ Genesis, 29, 1-11.

² On the spring flow tunnels, see Zip Y.D. Ron, Qantas and Spring Flow Tunnels in the Holy Land, in: Peter Beaumont, Michael Bonnie and Keith McLachlan (eds), A. Clachan (general ed.), Qantas, Kariz and Khattara: Traditional Water Systems in the Middle East and North Africa (Middle East & North African Studies Press, 1989), 211–236. In some places, the tunnels reached a length of 50–100 metres and, in one place, even 225 metres (id., 224). See also The Utilization of Springs for Irrigated Agriculture in the Judea Mountains, in: Avshalom Shmueli, David Grossman and Rehav'am Ze'evi (eds), Judea and Samaria (2 vols, Canaan Publishing House, Jerusalem, 1977, in Hebrew) vol. I, 230–250.

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level in the pool and order the opening and closing of the pool gates. Throughout the day, several women from the same hammulah would sit near the pool, talking casually, but also watching the elder at work. Similar arrangements for collective processes of allocation of quantities and for monitoring actual withdrawals enabled indigenous populations in North America and in the Philippines to adjust to the sometimes harsh environment.⁵

7. Distribution in cycles provided a built-in response to fluctuations in water supply; when the source dwindled, everyone received less. Thus, maintenance of the spring and the nearby storage pool, as well as of the horizontal extension of the spring flow tunnels into the rock to capture more water, was in everyone's interest. This shared interest, backed by the reliable allocation system and enforced by the myriad of ties between and within families unrelated to water use,⁶ enabled the development of long tunnels that extended well into the rock, well below the surface.

8. While strong family ties are conducive to reducing the costs of monitoring and enforcement, peasants in other regions have demonstrated that collective action can emerge despite the lack of such ties. Indeed, as Robert Wade has documented, fruitful cooperation emerged in some water-scarce villages in southern India, despite strict caste differences between the villagers and looser social ties.⁷ Such cooperation developed due to the relative scarcity of the resource and the fact that the peasants held a diversified portfolio of fields: some near the water source, some further below, in the flatter area. The villagers described by Wade managed to form a council that coordinated the efforts to obtain more water for the village, monitored the allocation of this water, collected taxes to finance its actions and fined violators. Violations occurred, and there were even suspicions that some farmers were using their position on the council to obtain unfair special benefits for themselves or their relatives. But all these concerns were addressed in public, on the local accountant's open veranda. Even more than fines did, the cost to reputation provided a reasonably effective sanction against violations. The council remained in operation for as long as it could ensure net gains to farmers from collective action.

9. But there were significant limits to these indigenous forms of cooperation. Both in the Judean Hills and in the southern Indian uplands, significant losses were caused by inter-village failure to cooperate. Sometimes the reason was the asymmetric upstream–downstream relationship between villages. At other times, due to sporadic seasonal flows, there was no

⁵ For the irrigation systems of the Pueblo Indians in New Mexico, see José A. Rivera, Irrigation Communities of the Upper Rio Grande Bioregion: Sustainable Use in the Global Context, 36 Nat. Res. J (1996), 491, 497 (describing the acequia associations, consisting of three elected ditch commissioners and the irrigators themselves, governed by rules based on custom and tradition); Robert Y. Siy, Jr (ed.), Community Resource Managment: Lessons from the Zanjera (University of the Philippines Press, Quezon City, Philippines, 1982) (describing the irrigation system in rural parts of the Philippines).

⁶ On multidimensional relations as reinforcing cooperation, see Elinor Ostrom, Governing the Commons: The Evolution of Institutions for Collective Action (Cambridge University Press, New York, 1990), 207; Russell Hardin, Collective Action (Johns Hopkins University Press, Baltimore, MD, 1982), 31–33.

⁷ Robert Wade, Village Republics: Economic Conditions for Collective Action in South India (Cambridge University Press, Cambridge/New York, 1988); Robert Wade, The Management of Common Property Resources: Collective Action as an Alternative to Privatisation or State Regulation, 11 Cambridge J. of Econ. (1987), 95.

incentive for setting up and maintaining mechanisms in anticipation for their occurrence. Here again, the Bible is a source of early evidence of conflict resulting from competition over water. The first Biblical stories of conflicts in Canaan relate not to contested land, but to competition over access to water.⁸ Lack of coordination often resulted not only in conflict, but also in inefficient and unsustainable use.⁹

10. Nevertheless, some communities managed to overcome even this collective failure. At times, religion proved a potent tool to iron out inter-village competition. Clifford Geertz describes this phenomenon, which survives to this day in parts of Indonesia.¹⁰ In the Island of Bali, each drainage basin has its own subak, or irrigation society. The subak is "in fact very much more: an agricultural planning unit, an autonomous legal corporation, and a religious community. Aside from house gardening, virtually everything having to do with cultivation lies within its purview."¹¹ It operates under a system that today could be described as subsidiarity, relegating decision-making and activities as much as possible to the village level.¹² The bond between potentially rival villages has been the shared religion. "The begetter of order in this otherwise rather particulate social field is the temple system. [...] The temple system provides both a simplified model of Balinese social structure and a schoolroom in which kinds of attitudes and values necessary to sustain it are inculcated and celebrated."13 One of the three great temples, the Great Council Temple, holds an annual ceremony, which is the climax of lengthy preparations of representatives of the surrounding subaks. As Geertz observed, "the integrative force of this continual collective effort, as it moves from one social context to another, is the linchpin of the entire system".¹⁴ This common belief system sustains an explicit local customary law that is enforced through negotiations.15

11. Religion was apparently also behind the uniquely successful management of the freshwater resources in Sri Lanka. The impressive story of conservation and environment protection in Sri Lanka since at least the third century BC was told by Judge Weeramantry of the

- 8 Genesis 26:15–22 (the Philistines covered the wells dug by Abraham and Isaac in an attempt to chase Isaac away from the area).
- 9 For examples of inter-village strife in ancient Palestine, see Ali Hasan Dawod Anbar, Socio-Economic Aspects of the East Ghor Canal Project (Ph.D. thesis, University of Southampton, 1983), 91–93; for examples of intervillage conflicts in India, see Robert Wade, Village Republics, n.7. This is the typical scenario of the tragedy of the water commons and arises, for example, in areas along the Mediterranean coast, where the opportunity of many individuals to dig wells led to numerous shallow wells and a lowering of the water table which, in turn, rendered many wells dry and increased the salinity of the coastal aquifer.
- 10 Clifford Geertz, Organization of the Balinese Subak, in: E. Walter Coward, Jr (ed.), Irrigation and Agricultural Development in Asia: Perspectives from the Social Sciences (Cornell University Press, Ithaca, NY, 1980), 70–90.
- 11 Ibid., 79.
- 12 Ibid., 79: "Theories of 'hydraulic despotism' to the contrary notwithstanding, water control in Bali was an overwhelmingly local and intensely democratic matter". The subak encompasses all owners of rice fields irrigated by a single dam. Organization is based on a one-person one-vote system for electing the subak head and other officials who perform allocation, monitoring, and maintenance works (80–81).
- 13 Ibid., 81.

15 Ibid., 81.

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¹⁴ Ibid., 88.

International Court of Justice.¹⁶ The deep religious roots of the reverence to natural resources are captured in the following excerpts from Weeramantry's opinion:¹⁷

The ancient chronicles record that when the King (Devanampiya Tissa, 247-207 B.C.) was on a hunting trip (around 223 B.C.), the Arahat [a person who has attained a very high state of enlightenment. . . .] Mahinda, son of the Emperor Asoka of India, preached to him a sermon on Buddhism which converted the king. Here are excerpts from that sermon:

"O great King, the birds of the air and the beasts have as equal a right to live and move about in any part of the land as thou. The land belongs to the people and all living beings; thou art only the guardian of it."

This sermon, which indeed contained the first principle of modern environmental law—the principle of trusteeship of earth resources—caused the king to start sanctuaries for wild animals—a concept which continued to be respected for over 20 centuries. The traditional legal system's protection of fauna and flora, based on this Buddhist teaching, extended well into the 18th century [...].

The sermon also pointed out that even birds and beasts have a right to freedom from fear (For this idea in the scriptures of Buddhism, see Digha Nikaya, III, Pali Text Society, p. 850.)

The notion of not causing harm to others and hence *sic utere tuo ut alienum non laedas* was a central notion of Buddhism. It translated well into environmental attitudes. "Alienum" in this context would be extended by Buddhism to future generations as well, and to other component elements of the natural order beyond man himself, for the Buddhist concept of duty had an enormously long reach.

This marked concern with environmental needs was reflected also in royal edicts, dating back to the third century BC, which ordained that certain primeval forests should on no account be felled. This was because adequate forest cover in the highlands was known to be crucial to the irrigation system, as the mountain jungles intercepted and stored the monsoon rains.

12. The Supreme Court of Sri Lanka was inspired by Judge Weeramantry's opinion in a judgment concerning the management of natural resources in Sri Lanka.¹⁸ Judge Amerasinghe relied on the Mahavamsa, the ancient historical chronicle of Sri Lanka, to assert the principle that "[t]he organs of State are guardians to whom the people have committed the care and preservation of the resources of the people." In his view, this principle

accords not only with the scheme of government set out in the Constitution but also with the high and enlightened conceptions of the duties of our rulers, in the efficient

¹⁶ Gabcikovo-Nagymaros Project (Hungary/Slovakia), Judgment, I.C.J. Reports 1997, 7; Separate Opinion by Judge Weeramantry, 88.

¹⁷ Ibid., 101-102.

¹⁸ Bulankulama v. Ministry of Indus. Dev., (2000) 3 Sri LR 243, available at www.commonlii.org/lk/cases/LKSC/ 2000/18.html (last visited 29 March 2008).

management of resources in the process of development, which the Mahavamsa, 68.8–13, sets forth in the following words:

"Having thus reflected, the King thus addressed his officers. In my Kingdom are many paddy fields cultivated by means of rain water, but few indeed are those which are cultivated by perennial streams and great tanks. By rocks, and by many thick forests, by great marshes is the land covered. In such a country, let not even a small quantity of water obtained by rain, go to the sea, without benefitting man. Paddy fields should be formed in every place, excluding those only that produce gems, gold, and other precious things. It does not become persons in our situation to live enjoying our own ease, and unmindful of the interests of the people."¹⁹

13. And perhaps, this entrenched cultural sensitivity to the preservation of natural resources enabled the Supreme Court of The Philippines to announce that the concept of inter-generational equality was a legal doctrine providing standing for representative of future generations to review governmental action concerning the use of natural resources.²⁰

III. Sustainability as the key to success of the ancient traditions

14. We can thus see that local traditions, sometimes sustained by shared religion, enabled communities to act collectively in the management of local water resources. These traditions provided a strong institutional framework to ensure collective compliance with central management of complex web of water resources for the benefit of all.

15. The key to sustainability was the fact that the collective decision-making process took into consideration the interests of all users of the resource. It precluded decisions that burdened some users for the benefit of others. It precluded decisions that burdened future generations. Because the interests of future generations were taken into account, the management of these resources proved sustainable, and in fact survived in many instances until this day. Nowadays, we can theorize about the usefulness of such collective action mechanisms.²¹ But it took modern scholars a long time to realize the reasons for that success and to try to revive it.

16. Indeed, these sustainable traditions were often neglected in the modern era. Several emerging regimes in the developing world, supported by Western scientists irreverent to "native" and "primitive" cultures and practices, shattered those ancient systems. The modern systems have proved to be less efficient. Contemporary scientists and disillusioned

¹⁹ Ibid., 253-254.

²⁰ Minors Oposa v. Sec'y of Dep't Env't and Natural Res., 33 I.L.M. (1994), 174 ("Needless to say, every generation has a responsibility to the next to preserve that rhythm and harmony for the full enjoyment of a balanced and healthful ecology. Put a little differently, the minors' assertion of their right to a sound environment constitutes, at the same time, the performance of their obligation to ensure the protection of that right for the generations to come").

²¹ See Eyal Benvenisti, Sharing Transboundary Resources: International Law and Optimal Resource Use (Cambridge University Press, 2002); Collective Action in the Utilization of Shared Freshwater: The Challenges of International Water Resources Law, 90 American JIL (1996), 384.

governments have discovered by now that religious rites in Bali and Cambodia may be more efficient than modern command and control systems run by short-sighted central bureaucracy and strive to reconstruct them wherever this is still possible.²² Since attempts to introduce modern strains of rice and fertilizers brought only environmental disaster, the Indonesian government has recently been trying to convince farmers to revert to the ancient Balinese "rice cult" noted so precisely by Geertz.²³

17. The temptation to ignore the limits of the local common pool resource and adopt an "economy-of-scale" approach is not a twentieth-century invention. Along the successful small-scale efforts, the allure of water management on a grand scale was evident already in the ancient empires of Sumer and Assyria. Outsiders to the common resources collaborated with those who hoped to increase revenues from them by placing the smaller resources under an all-encompassing joint management. This required the replacement of the delicate mechanisms that had ensured individual incentives to cooperate with imposed rules and sanctions to compel cooperation. Such efforts gave birth to despotism and produced inefficient and unsustainable regimes. Disrespect for nature has been a major cause for the demise of such despotic empires.

18. This is the legacy of the ancient empires of Sumer and Assyria in Mesopotamia, described by Karl Wittfogel.²⁴ According to his account, in all great ancient civilizations, such as Sumer and Assyria in Mesopotamia, Pharaonic Egypt, Ancient China and India, taming the large rivers was the catalyst for their evolution. Wittfogel linked what he termed the "Oriental despotism" of these societies to their internal efforts to promote their economic growth through the use of more water to irrigate more fields. He therefore called them "hydraulic societies". Harnessing the mighty rivers for large-scale irrigation in fertile but otherwise dry lands necessitated the construction of lengthy irrigation canals and sophisticated flood-control devices and, hence, required a submissive and cheap workforce. Authoritarian bureaucracies emerged to control this workforce, to cajole and discipline it. Despotic structures of governance were required only because the many workers recruited for the arduous task of digging and maintaining irrigation canals and other protective works gained very little from their efforts. The ruling elite had to design a strong bureaucratic apparatus and sophisticated methods of governance to control people and, thus, to ensure maximal water use.²⁵ Laws had to be promulgated to provide the authority for the bureaucratic activity and for disciplinary measures. Hammurabi's Code, for example, prescribes penalties for neglecting the maintenance of irrigation ditches in Mesopotamia.²⁶ As Wittfogel explains:

²² Jane Ellen Stevens, Science and Religion; Cultural Practices and Ecology, 44(2) Bioscience (1994), 60. 23 Ibid.

²⁴ Karl A. Wittfogel, Oriental Despotism: A Comparative Study of Total Power (Yale University Press, New Haven, CT, 1957).

²⁵ Ibid., 109.

²⁶ Laws of Hammu-Rabi, No. 55, Rep., in: G.R. Driver and C. John Miles (eds), The Babylonian Laws: Ancient Codes and Laws of the Near East (2 vols, Clarendon Press, Oxford, 1952–55), vol. II, 31.

Having access to sufficient arable land and irrigation water, the hydraulic pioneer society tends to establish statelike forms of public control. Now economic budgeting becomes one-sided and planning bold. New projects are undertaken on an increasingly large scale, and if necessary without concessions to the commoners. The men whom the government mobilized for corvee²⁷ service may see no reason for a further expansion of the hydraulic system; but the directing group, confident of further advantage, goes ahead nevertheless. Intelligently carried-out, the new enterprises may involve a relatively small additional expense, but they may yield a conspicuously swelling return. Such an encouraging discrepancy obviously provides a great stimulus for further governmental action.²⁸

19. The logic of these hydraulic societies was strikingly different from the logic of the collective action sustained by communal and religious practices. These societies were based on a vertical power relationship between the bureaucratic elite and the peasants. The elite's constant drive for further taming of nature proved to be so unsustainable that it led to its demise. While one part of the tale of these societies is a tale of despotism, the other part is therefore a tale of unsustainability, which resulted in their demise. These hydraulic societies declined and ultimately disappeared, in large part due to the salinization of fields by the sediments in the water carried by the lengthy irrigation canals.²⁹

20. The ascendancy of the modern State and its use of its central powers did not ensure optimal and sustainable use of its natural resources. Indeed, the story of Sumer and Assyria was often repeated by central governments set on providing food to their mushrooming populations and eager to stride towards development. Between 1950 and 1980, there was an almost three-fold increase in the total area of irrigated global agriculture. This increase augmented agricultural output by between 50 and 60 per cent, but at a dear price: many of the large-scale irrigation projects proved to be heavily subsidized and unsustainable economically (when comparing the rate of return with opportunity costs of capital).³⁰

21. The opportunity to progress through interference with nature, so tempting for the Mesopotamian rulers, has proved attractive to many, if not most, governments in the developing world. During the second half of the twentieth century, many of those governments embarked on water-related mega projects, such as high dams or extensive

²⁷ Note by this author: Corvee labour is temporary but recurring forced labour. Corvee workers were recruited seasonally, usually before the flooding period. On this type of recruitment, see Wittfogel, Oriental Despotism, n.18, pp. 47–48.

²⁸ Ibid., 109.

²⁹ Clive Ponting, A Green History of the World (Sinclair-Stevenson, London, 1991).

³⁰ Elinor Ostrom, Crafting Institutions for Self-Governing Irrigation Systems (ICS Press, San Francisco, 1992), 1–7. See also World Development Report 1992 (Development and the Environment, The World Bank),

^{100:} about 73 per cent of water withdrawals are allotted for irrigation and are heavily subsidized. In India, irrigation accounts for 93 per cent of water consumption: Salman M.A. Salman, The Legal Framework for Water

Users' Associations: a Comparative Study (World Bank, Washington, DC, 1997), 1-2.

irrigation systems.³¹ The national command and control systems they set up for the management of those projects were fraught with all of the regular maladies of central management. Losses often occurred, allocations were often skewed and deprivations were often the result of human action rather than nature's curse.

22. Sometimes, losses resulted from a poor understanding of hydrology or of environmental processes. It is believed that poor understanding of the harsh effects of water sedimentation and of field salinization was responsible for the demise of the great empires of Assyria and Sumer. Similarly, the popularity of high dams in the crucial span of about half a century, beginning in the 1930s and ending in the 1980s, is now believed to have contributed to the deteriorating environmental conditions in many countries.³² Deforestation is now understood to be a major cause of soil erosion and hence of deadly floods and mud slides, including, for example, the 1998 floods that affected 180 million people (4150 of them killed) in the Yangtze basin.

IV. Asian traditions and the evolution of international law

23. The international system of sovereign States as a whole failed to rise to the challenge of collective action to manage shared transboundary resources. Thus the question of management of transboundary resources has become a complex issue of international law in the last 50 years. There is a great temptation for governments to pursue their unilateral interests, imposing their will on relatively weaker neighbours. Such temptations raise the concern that future unilateral management decisions will be unsustainable and inequitable, indeed even threatening the future availability of these crucial resources. Both experience and theory tell us that there is an alternative. Such an alternative consists of modalities for collective action that can ensure that the net benefits they provide for all users in the long run are greater than the benefits of unilateral action. The challenge to international law is to come up with tools that would facilitate such cooperation.

24. There are several ways for international law to impress upon governments the necessity, indeed the legal duty, to cooperate closely in the management of shared transboundary resources. It is beyond the scope of this paper to spell them out in detail.³³ But what is important to note in this respect is that the Asian traditions do not provide us with useful examples of success stories in overcoming unilateralism. Also, they do not offer guidelines as to the proper course of development for international law. These traditions inform the evolution of international law on the management of transboundary resources.

³¹ See William M. Adams, Wasting the Rain: Rivers, People and Planning in Africa (Earthscan, London, 1992); Fred Pearce, The Damned: Rivers, Dams, and the Coming World Water Crisis (Bodley Head, London, 1992); Patrick McCully, Silenced Rivers: The Ecology and Politics of Large Dams (Zed Books, London/Atlantic Highlands, NJ, 1996).

³² Edward Goldsmith and Nicholas Hildyard, The Social and Environmental Effects of Large Dams (Sierra Club Books, San Francisco, 1984), 17.

³³ For a detailed discussion, see Benvenisti, above n.21.

As suggested by Judge Weeramantry, who, after exploring the ancient Asian water management systems, said:³⁴

As modern [international] environmental law develops, it can, with profit to itself, take account of the perspectives and principles of traditional systems, not merely in a general way, but with reference to specific principles, concepts, and aspirational standards.

Among those which may be extracted from the systems already referred to are such far-reaching principles as the principle of trusteeship of earth resources, the principle of intergenerational rights, and the principle that development and environmental conservation must go hand in hand. [...]

Natural resources are not individually, but collectively, owned, and a principle of their use is that they should be used for the maximum service of people. There should be no waste, and there should be a maximization of the use of plant and animal species, while preserving their regenerative powers. The purpose of development is the betterment of the condition of the people.

Most of them have relevance to the present case, and all of them can greatly enhance the ability of international environmental law to cope with problems such as these if and when they arise in the future. There are many routes of entry by which they can be assimilated into the international legal system, and modern international law would only diminish itself were it to lose sight of them—embodying as they do the wisdom which enabled the works of man to function for centuries and millennia in a stable relationship with the principles of the environment. This approach assumes increasing importance at a time when such a harmony between humanity and its planetary inheritance is a prerequisite for human survival.

25. Asian traditions have also informed national courts in Asia on the contemporary applications of ancient concepts for the sustainable management of domestic natural resources to the benefit of future generations.³⁵ These applications can nurture the contemporary understanding of the right to water in international law.³⁶

26. It is to be hoped that these great traditions would inform contemporary decisionmakers in Asia and elsewhere. We have much to learn from our ancestors on how to manage the natural resources they handed down to us.

³⁴ See above n.16.

³⁵ See above n.18-20.

³⁶ On the role of domestic courts, particularly Asian courts, in the development of the human right to water, see Eyal Benvenisti, Water, Right to, International Protection, in: R Wolfrum et al. (eds), Encyclopedia of Public International Law (forthcoming, 2008).