

GLOBAL WATER GOVERNANCE: FROM JOHANNESBURG TO KYOTO, SHIGA, AND OSAKA

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1 INTRODUCTION

The water crisis is a crisis of water quantity. Although 70% of the surface of the globe is covered by water, 97.5% of it is salt water.ⁱ Only 2.5% of global water is freshwater, and less than 1% of the freshwater resources are accessible for human use. With a rapid increase of human population, water stresses at both macro and micro levels have worsened.ⁱⁱ It is projected that about half of the world's population will experience water shortages by 2025.ⁱⁱⁱ The water crisis is a crisis of water quality. In developing countries, untreated sewage from expanding urban populations contaminates nearby rivers and lakes, and changing agricultural and industrial practices pollute watercourses. In developed countries, where stricter governmental regulations have been introduced, toxic chemicals persistently threaten human and ecological health. As water pollution increases, the volume of usable water further decreases. It is also a crisis of governance. There are inefficiencies and inequalities in water accessibility and distribution, and water-stressed areas are geographically dispersed. Socio-economic globalization adds a new global dimension to the water cycle. The production and export around the world of water-consuming agricultural and other products can affect global security by producing local and regional water conflicts. Therefore, we need more water, cleaner water, and better water governance.

To increase awareness of the importance of freshwater and to promote action at the local, national, regional, and international levels, the United Nations (UN) General Assembly proclaimed 2003 as the International Year of Freshwater.^{iv} Water was also identified as one of the priority areas by UN Secretary General Kofi Annan for the 2002 World Summit on Sustainable Development (WSSD). WSSD reviewed progress of *Agenda 21* adopted at the 1992 UN Conference on Environment and Development (UNCED) in Rio de Janeiro. Compared with air and land-based environmental issues, global responses to freshwater issues appear slow and delayed. Although progress on the climate change issue is still far from ideal, the UN Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol have been established. Similarly, although UNCED failed to reach a global forest treaty, a forest declaration is in place and, despite delays, the UN Convention to Combat Desertification has been formed. What can we say of an international regime on freshwater?

In responding to the water governance crisis, concerned professionals, academics, and international organizations took the lead in establishing, in 1996, the World Water Council (WWC), which organizes the World Water Forum every three years. During the period from Rio to Johannesburg and beyond, Japan agreed to host two important conference events in Kyoto: the 1997 Third UNFCCC Conference of the Parties (COP3) and the 2003 Third World Water Forum (WWF3). Just as COP3 was expected to translate the UNFCCC into actual commitments, WWF3 was also expected to translate the *World Water Vision* into actions and commitments.^v

This paper aims to answer the following questions that were raised especially in Johannesburg and Kyoto: Why and how is the creation of an international regime on freshwater difficult and delayed? Why and how effectively did, or did not, the state and other major groups respond to the water governance crisis? In answering these questions, this paper first reviews and examines different, and sometimes competing, conceptualizations of water by elaborating the three pillars

of sustainable development. These include: water for sustained economic growth, water for sustainable human and social development, and water for ecologically sustainable development. Then, it examines different directions of water governance by looking at the local, national, international, and transnational levels.

2 SPLASHED AND WHIRLED CONCEPTUALIZATIONS OF WATER

2.1 Three Pillars of Sustainable Development

Water is more than just H₂O. The sustainable development concept has been evolved over the three decades since the 1972 UN Conference on the Human Environment in Stockholm. Five years after Stockholm, the UN Water Conference held in Mar del Plata, Argentina, gave priority to the basic human needs of safe drinking water and sanitation services. Because the 80% of blood comprising the human body is in the form of water, let me call water for people as “red water.”

The Rio Summit attempted to reconcile the issues of environment and development. In preparation for UNCED, the International Conference on Water and the Environment was held in Dublin, Ireland. The Dublin Principles include freshwater as a finite and vulnerable resources; and water as an economic good. These principles formed the basis of Chapter 18 of *Agenda 21*.^{vi} The *World Water Vision* named water for nature in two ways: “blue water” – renewable surface water runoff and groundwater recharge, and “green water” – the rainfall that is stored in the soil and evaporates from it;^{vii} and I call income-generating water for sustained economic growth “gold water.”^{viii}

Since Rio, a series of UN-hosted global conferences and the UN Commission on Sustainable Development (CSD) have led to the widely recognized three pillars of sustainable development. In preparation for WSSD, the Ministerial Declaration at the 2001 International Conference on Freshwater in Bonn states “it is necessary to take into account water’s social, environmental and economic dimensions and all of its varied uses.”^{ix} These pillars were crystallized into the slogan for WSSD: “people, planet, and prosperity.” These were also symbolized in the three main cities hosted WWF3 events: Kyoto, Shiga, and Osaka. Kyoto was a place of water and culture; Shiga was water for nature; and Osaka was water for industry. Thus, the water concepts were splashed in the three directions and whirled into a framework of integrated water resources management.

Global Conferences	Water Conferences	World Water Forum
Stockholm (1972)		
Rio de Janeiro (1992)	Mar del Plata (1977) Dublin (1992)	Marrakesh (1997) The Hague (2000)
Johannesburg (2002)	Bonn (2001)	Kyoto (2003)

Table 1: Chronology of Main Global and Water Conferences

2.2 Gold Water and Sustainable Economic Growth

The three major economic sectors of agriculture, industry, and municipal services compete for finite natural resources of water. At the global level, agriculture, especially for irrigation, is the largest consumer of freshwater, and its share of water withdrawals has increased over the second half of the last century.^x A significant amount of water is used by the industrial sector, including water for hydropower energy production, especially in developed countries. The share

of municipal water services is limited but important for drinking water, sanitation, bathing, food preparation, and other uses.

There is also competition for water within economic sectors. Postel warns that the mismanagement of irrigated agriculture led to the collapse of ancient civilizations, and this may be repeated in modern irrigation systems through salinization and poor drainage.^{xi} To avoid this, the strategy of “more crop per drop” is called for. The *World Water Vision* asserts that water for agriculture should be limited to a range of conditions that include increasing water efficiency. This strategy may be correct, but increased agricultural efficiency must be accompanied by improved governance. For instance, high yields are expected from the recently introduced New Rice for Africa (NERICA), which is a hybrid rice resistant to local dry stress, capable of good yields without using fertilizer, and over 200% higher yields are expected with the use of fertilizer.^{xii} A possible consequence is that wealthier irrigators in upstream areas may grow the rice with more fertilizers. It is also reported that irrigation may widen an income gap between wealthy male-dominant irrigators and impoverished female rain-fed farmers.^{xiii}

If irrigated agriculture continues to expand, a conflict may also emerge between the Millennium Development Goals (MDGs) set in 1990. One goal is to halve the proportion of people who suffer from hunger and another is to halve the proportion of people without sustainable access to safe drinking water. The addition of a sanitation target into the Johannesburg Plan of Implementation also adds an impetus to municipal service industries in allocating water as an economic good.

There was also a big debate on hydropower as a renewable energy in Johannesburg. The European Union suggested a target of 15% renewable energy, including hydro, whereas Brazil-led Caribbean and Latin American developing countries suggested excluding hydro from a target of 10% renewable energy. The NGO community criticized both positions by saying that large-scale hydro dams have adverse effects on society and the environment. The USA, Japan, and OPEC representatives did not like such a target. The outcome was deletion of such a target from the Plan of Implementation. The absence of a renewable energy target added another unfavorable condition to the already stagnant investment in hydropower facilities, although like-minded countries may establish a regional or cross-regional target. In short, “sustained economic growth,” which means continuous economic growth as a parochial goal should be shifted to “economically sustainable development,” as a global goal, which means economic activity without environmental degradation and social inequality.

2.3 Red Water and Sustainable Human and Social Development

The social dimensions of water can be understood through the relationships between social structure and the concepts of class, gender, generation, and ethnicity. Since Mar del Plata, water supplies for filling basic human needs have been a top priority, especially for poor people. The subsequent International Drinking Water Supply and Sanitation Decade achieved some progress, but it did not meet the demands of a rapidly increasing poor population in developing countries. The MDGs included a target of safe drinking water, but not of sanitation. The Johannesburg Plan of Implementation agreed to “halve, by the year 2015, the proportion of people who are unable to reach or to afford safe drinking water (as outlined in the Millennium Declaration) and the proportion of people who do not have access to basic sanitation.”

Because the concepts of gender, generation, and ethnicity are social, which should be distinguished from biological concepts of sex, age, and race, social processes are required for mainstreaming. The integration of a water supply and sanitation target was realized in the context of gender mainstreaming. Women and girls fetch water over long distances in many developing countries. Women and girls are also most affected by poor sanitation. The health of children is seriously affected by the lack of clean water and adequate sanitation and hygiene. It is said that diarrhea, which results from inadequate water supply and sanitation services, killed

more children in the last decade than all people lost to armed conflict since World War II.^{xiv} The introduction of western technologies and practices are not always culturally acceptable to different ethnic groups and indigenous people.

The social dimensions of water sometimes conflict with economic and environmental dimensions. For instance, mortality rates from malaria, a disease strongly linked to water, have risen since the 1980s in Africa, mainly because of the decreased effectiveness of the anti-malarial medication chloroquine. Recently developed medications, protected by strengthened rules of intellectual property rights, are unaffordable to poor people, although the 2001 Ministerial Meeting of the World Trade Organization (WTO) in Doha agreed that the Trade-Related Intellectual Property Rights (TRIPS) agreement could be used flexibly by WTO members to protect public health.^{xv} In addition, social resettlement due to the development of dams and the expansion of irrigation systems as well as deforestation and climate change are favoring the spread of malaria-carrying mosquitoes.^{xvi}

2.4 Green and Blue Water and Ecologically Sustainable Development

The ecological dimensions of the water crisis are least acknowledged. Economic and social manipulations of the hydrological cycle have adverse impacts on aquatic and other ecosystems, including climate change, loss of biodiversity, deforestation, desertification, and marine degradation. The hydrological cycle of climate, green and blue water is a global phenomenon, and yet the water issue was long regarded as a local, or at best basin-level, problem. This is partly because the history of water crisis is quite long, compared with global warming, which was recognized as a global issue only in the late 20th century. Thus, an epistemological linkage between climate change and green and blue water is necessary to further acknowledge water as a global issue. Climatic turbulence accelerates the number of serious floods and droughts in many parts of the globe. The threat of flooding from rising sea levels is increasing. Climate change will also have serious impacts on agricultural production and human health.

Biological diversity, at the levels of ecosystems, species, and genes, is projected to decrease significantly as a result of human interference with the water cycle. Inappropriate water consumption by humans often changes the ecosystems of wetlands, riparian and coastal habitats. The construction of dams and similar structures intended to increase socio-economic benefits interrupts the natural water cycle and threatens the survival of some species, especially anadromous fish. The Johannesburg Plan of Implementation set out the target year of 2010 to achieve a significant reduction in the current rate of loss of biodiversity, and yet it is difficult to scientifically agree on what is a minimum water requirement, in terms of both quantity and quality, and what is the necessary level of water-related biological diversity.

Droughts and desertification are also accelerated by human activities. One of the most tragic examples is the over-consumption of water for cotton agriculture in the upstream areas of the Aral Sea. A policy of providing heavily subsidized agricultural water in the former Soviet Union did not take the ecological health of water into account. To maintain the integrity of the hydrological cycle, an adequate volume of clean water must be reserved or maintained. It is extremely difficult, however, to determine what level is needed for that purpose.

3 WATERSHED OR WATERED-DOWN IN GLOBAL GOVERNANCE?

3.1 Partnerships in Question

Despite the fact that the splashed concepts of water as mentioned above are intertwined, scientific efforts have not been successful in fully explaining the complex dynamics between the interrelated concepts of water. A multidisciplinary approach may not be enough to understand

and prescribe the water cycle problems associated with the three pillars of sustainable development. A new transdisciplinary approach, such as complexity theory may prove useful in understanding the large-scale interactions and complexity of water issues.^{xvii} If current sciences are not yet sufficiently mature, the next best strategy for approaching the goal of sustainable development is to use the high-level decision-making skills. In attempting this, integrated water resources management and governance have been proposed and implemented by involving a wide range of multi-stakeholders at local, national, international, and transnational levels.

The UNCSD initiated a multi-stakeholder process in 1998, which eventually involved all of the nine major groups mentioned in *Agenda 21*: women, youth, indigenous people, non-governmental organizations (NGOs), local authorities, workers and trade unions, business and industry, the scientific and technological community, and farmers.^{xviii} A multi-stakeholder approach has also been used to produce the *World Water Vision*. Two other stakeholders—legislators and the mass media—were added at WWF3. These major groups conform with the participation principle of addressing the three pillars of sustainable development, and the subsidiarity principle of decentralizing to an appropriate level to solve problems. The participation in the policy cycle by farmers, business-people, and workers is useful in balancing economic sectors in a market society and water for economic growth; women, children and youth, indigenous people, and NGOs are representatives of civil society and water for people and nature. The scientific and technological community is searching for shared knowledge for decision-making.^{xix} The involvement of local authorities is related to the subsidiarity principle at the subnational level, in contrast to national and international governance. For transnational actors, geographical subsidiarity is less obvious, although globalism and localism still exist, as shown in Table 2.

State	Market Society	Civil Society	Epistemic Community
Internationalism	(Globalism)	(Globalism)	(Globalism)
Nationalism	Transnationalism	Transnationalism	Transnationalism
Subnationalism	(Localism)	(Localism)	(Localism)

Table 2: Subsidiarity Level and Participation of Multiple Stakeholders

According to the Commission on Global Governance, governance refers to “the sum of the many ways individuals and institutions, public and private, manage their common affairs.”^{xxx} Some regard multi-level, multi-stakeholder partnerships as “a watershed in global governance.”^{xxxi} Others are skeptical, and even suggest not joining the pet projects of big businesses and superpowers. In the context of Partnership Initiatives, an element of the WSSD outcomes, some NGOs accused the developed country governments of using non-negotiated partnerships as watered-down substitutes for official actions and commitments to be agreed on through inter-governmental negotiations. Some developing countries also cautioned that additional money for partnership projects should not further decrease inter-governmental official development assistance (ODA). Thus, multiple stakeholders can downgrade existing partnerships to watered-down cooptation, rather than cooperation. To retain partnerships as genuine global governance, it is important to understand how different agents have responded to the water governance crisis, and the extent to which, and the conditions under which, the respective approaches to water governance are workable with reference to the subsidiarity and participation principles.

3.2 National and Subnational Governance

Water resources were traditionally regarded as common goods within many indigenous forms of governance. According to Hardin’s “tragedy of the commons” perspective, however, traditional governance of common goods cannot be sustainable, when an increased number of individuals overexploit them. It is perhaps erroneous to assume that all the existing traditional systems would follow this tragic pattern. When the final Preparatory Committee for WSSD was held in Bali, for example, the traditional Balinese irrigation system called *Subak* was presented as a still

well-functioning practice. Local communities are normally more familiar with local needs and solutions than are national governments. In this sense “decentralization is key,” as summarized in *The Bonn Keys*.^{xxii}

Nowadays, the local governments are normally the authorities expected to supply basic water services. When water problems cannot be solved by local governments, they are transferred to national governments. In this sense, local authorities are expected to be consistent with the modern state system. The view of basic water as a public good has been challenged by decreases in bureaucratic efficiency and increases in fiscal deficits of welfare states. Nevertheless, the basic water concept can be strengthened by adopting the human rights approach. It is connected to the second generation of human rights, which are economic and social rights under the state. The WWF3 Statement followed the Bonn Ministerial Declaration stating that “The primary responsibility of ensuring the sustainable and equitable management of water resources rests with the governments.”^{xxiii}

The structure of the state’s functions of water is based on the functional division of power: legislative, administrative, and judicial. It is important to incorporate the three pillars of sustainable water development under existing water laws and regulations. In particular, the component of water for the ecosystem is least integrated. The recently amended South African Water Law acknowledges, and places a high priority on, the water ecosystem as a good model.^{xxiv} Administrative policies and measures, subsidies and/or taxations are important, especially for allocating water for agricultural, industrial, and municipal uses. Therefore, the performance of subsidized sectors should be critically reviewed in a transparent way, so that the three pillars of water can be balanced. Fair treatment of water disputes by the judiciary is also important, and yet it is equally important for national water governance to develop a preventive network of surveillance and dialogue among multi-stakeholders before serious water disputes happen within national boundaries.

3.3 International Governance

When national governments face difficulties in solving water problems, for instance on transboundary watercourses, international governance is called for. Although the international community has no central government, internationalism offers unilateral, joint, or collective means of solving a crisis in governance.

Unilateralism is the ideology that a state should exert unilateral power, as it does within a national territory. Unilateralism regarding transboundary waters is known as the Harmon Doctrine.^{xxv} It claims absolute sovereignty over transboundary waters within its own territory, and that international law on the sharing of waters does not apply to a riparian state. This view does not constitute international customary law, and yet upstream states have sometimes presented a view similar to this.^{xxvi}

Bilateral or regional state actions have been attempted to deter unilateralism. Many bilateral, plurilateral, or regional agreements have been concluded by riparian states. The European and American approaches (e.g., the Rhine River and the Great Lakes) were relatively successful, but many of these successful agreements are concentrated in developed countries. Joint actions by upstream and downstream countries appear more difficult to institutionalize for international watercourses running through developing areas. Allan suggests the “virtual water” concept for peaceful trading of the water embedded in water-intensive commodities.^{xxvii} Although there are political and methodological limitations to virtual water, it is a useful attempt to consider economic-food-ecological chains of water across boundaries.

Unlike unilateralism or bilateralism, multilateralism assumes that a collective entity is ontologically prior to nation-states. After many years, the UN Convention on the Law of the Non-Navigational Uses of International Watercourses was adopted and became open for

signature in 1997. The principles of equitable and reasonable use are the main thrust of the Watercourses Convention. However, the required number of signatories was not collected by the prescribed date. Thus, legally binding collective efforts have not yet been effective, although an increased number of multilateral administrative and financial arrangements on water can be found in the UN system. UNESCO, among others, launched the World Water Assessment Program, which published its first *World Water Development Report* at WWF3.^{xxviii} Since 1991 the Global Environment Facility (GEF) has been serving as a financial mechanism for degraded international waters in developing countries. The Water Supply and Sanitation Collaborative Council (WSSCC), formed in 1990 with a mandate from the UN General Assembly, is now leading the Water, Sanitation, and Hygiene for All (WASH) campaign to attain the *Vision 21* goal.^{xxix} These efforts are led by the UN multilateralism, not supranationalism, and were started by introducing the concept of water as “global public goods.”^{xxx}

3.4 Transnational Governance

Public goods and collective goods are similar, except that public goods are supplied by the public sector and collective goods can be supplied not only by the public but also by the private sector. Governance by transnational agents includes corporate governance in the market society, civil governance in the NGO community, and knowledge-based governance in the epistemic community in isolation and in combination as public-private partnerships (PPPs) at all levels.

Historically the enclosure was a solution to the tragedy of common goods by transforming them into private property. It was expected that individuals would maximize efficiency in exploiting the natural resources in a sustainable way. In today’s context, deregulation and privatization of water services are at the center of the hottest debate on water governance. Water pricing is expected to encourage conservation and wise consumption of water, and market competition is also expected to result in improved services and quality of water. Service liberalization is being accelerated by the WTO General Agreement on Trade in Services (GATS). It is debatable, however, whether these expectations actually work. While higher water prices after privatization are reported from some areas, water service charges are lower than before in other areas.^{xxxi} Thus, the socio-economic impacts of deregulation and privatization are mixed, and socio-environmental impacts of PPPs are also unclear. This led to the cleavage between the joint conveners for the session on PPPs at WWF3 in producing separate statements.

A distinction should be made between private ownership of water and private services supply. A business leader argues the preferred partnership is where “the operation of the assets is entrusted to a private operator for the term of contract.”^{xxxii} The transfer of water infrastructure from public to private ownership is not required here, and even the price of water can be determined by the public sector.

Civil society takes the human rights approach to water as a public good. NGOs argue that governments should provide clean water for the poor, and any private participation in providing water services should not extend control over water itself. According to the NGO Freshwater Caucus, “priority should be given to the satisfaction of basic needs and the safeguarding of ecosystem. *Beyond* these requirements, however, water users should be charged appropriately.”^{xxxiii} Progressive payment systems have been suggested by NGOs for industrial and heavy users, but cost recovery policies must not restrict access by the poor to water.^{xxxiv} For civil society, good governance means participation by civil society.^{xxxv} In particular, NGOs call for procedural rights: access to information, public participation, and access to justice at the national and international levels based on Rio Principle 10. Voluntary corporate accountability initiatives are inadequate from the NGO perspective, which instead calls for a legally binding framework for corporate accountability under the UN. The civil society view is shared by the governments of some developing countries.

The epistemic communities of hydrological scientists and professionals, including the International Water Resources Association, have extended their policy networks actively in the mid-1990s. The knowledge-based communities exert influence on policy innovations by framing the range of political controversy surrounding the water issues, defining state interests, and setting standards.^{xxxvi} The World Water Council, established in Marseilles as an international water policy think tank in 1996, influences many aspects of water issues by framing political controversies through the World Water Forum. The Global Water Partnership (GWP) was also established in 1996. Together with UNDP and the International Council for Local Environmental Initiative (ICLEI), it coordinates the Dialogue on Effective Water Governance, to facilitate communication in clarifying conflicting interests between government and multi-stakeholders for successfully integrating water resources management in several countries.^{xxxvii} A standard-setting activity was attempted by the World Commission on Dams (WCD), which was established in 1997. The WCD reviewed large dams and proposed priorities, criteria, and guidelines for change.^{xxxviii}

The PPPs model obtained momentum in Johannesburg by launching additional and new projects as Partnership Initiatives, which included, by the end of August 2002, at least 18 partnership projects primarily focused on freshwater. The number of such projects is still growing, and some projects held their sessions at WWF3. It is important to monitor and empirically evaluate actual performance of existing partnership projects and programs in such an event.

4 CONCLUSION

The formation of the international regime on water governance was difficult, partly because different conceptualizations of water splashed out in at least three directions and proved difficult to pour into the single pot of sustainable development. The international response to water crisis was delayed, partly because the water crisis, unlike global climate change, has been long recognized as a local problem, and the local community was less empowered to solve the problem. Also, the hydrological cycle is cutting across administrative and national boundaries in a fluid way. It was too splashed and too fluid to be contained by the socially constructed pots of the existing governance systems.

The state, market society, and civil society have responded to the water crisis by overcoming the tragedies of the commons, state failures, and market failures, respectively. In doing so, they established the norms and principles of efficiency, fairness, and cooperation. The involvement of the epistemic community is another way to overcome the limitations of the existing governance system; however, the scientific community is also not sufficiently perfect or mature. Thus, active participation of different stakeholders is called for to minimize the risk of reaching erroneous decisions and actions. In this context, partnerships among multi-stakeholders are the most popular means to the governance crisis of water.

Do partnerships really lead to good water governance? One view is that a partnership without a world government is the form of governance in the 21st Century. From the realist perspective, however, it will undermine Westphalian sovereignty. From a radical point of view, it will eventually lead to the oligopoly of global corporate governance of water. This paper concludes that partnership-based governance can evolve beyond the previous forms of water governance if at least two conditions are met. One condition is that multi-stakeholder participation sufficiently supplements the scientific limitations of the complex water dynamism by balancing the economic, social, and environment dimensions of water issues. Another condition is that meaningful participation by multi-stakeholders is effectively institutionalized at all the levels to assure the integrity of water cycle.

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Notes

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- ⁱ World Meteorological Organization and UNESCO, *The World's Water: Is There Enough?* (WMO and UNESCO, 1997), p. 8.
- ⁱⁱ At the macro level, Malin Falkenmark argues that 1,700 m³ per person per day is a threshold for serious water stress for food production. At the micro level, Peter Gleick suggests a minimum basic water requirement is 50 liters per person per day. Marq de Villiers, *Water* (Mariner, 2001), p. 20.
- ⁱⁱⁱ United Nations, *Global Challenge Global Opportunity: Trends in Sustainable Development* (UN Department of Economic and Social Affairs, 2002), p. 11.
- ^{iv} Resolution 55/196 adopted by the UN General Assembly, 20 December 2000.
- ^v World Water Council, *A Water Secure World: Vision for Water, Life and the Environment* and *World Water Vision: Making Water Everybody's Business* (World Water Council, 2000).
- ^{vi} *The Dublin Statement on Water and Sustainable Development*, Guiding Principles 1 and 4.
- ^{vii} *World Water Vision*, p. xx.
- ^{viii} I was inspired by Maude Barlow and Tony Clarke, *Blue Gold* (N.Y.: New Press, 2002).
- ^{ix} Secretariat of the International Conference on Freshwater, *Conference Report*, Bonn, 2002, p. 20.
- ^x *Global Challenge Global Opportunity*, p. 11.
- ^{xi} Sandra Postel, *Pillar of Sand: Can the Irrigation Miracle Last?* (New York: W.W. Norton, 1999), especially Chapters 2 and 5.
- ^{xii} *NERICA Rice: Hope for Food Security in Africa*, prepared by the Government of Japan, UNDP, and West Africa Rice Development Association (WARDA), 31 August 2002.
- ^{xiii} Postel, *Pillar of Sand*, Chapter 10, Japanese translation ed., p. 260.
- ^{xiv} The WEHAB Working Group, *A Framework for Action on Water and Sanitation* (United Nations, 2002), p. 11.
- ^{xv} *Declaration on the TRIPS agreement and public health*, adopted on 14 November 2001.
- ^{xvi} *Global Challenge Global Opportunity*, p. 19.
- ^{xvii} Seiichi Kondo, "Mondai no zentai-teki kaiketsu ni chikazuku tame ni (Towards a holistic solution of the problems)," *Gaiko Forum* (September 2002), pp. 44–49.
- ^{xviii} Minu Hemmati, *Multi-stakeholder Processes for Governance and Sustainability* (London: Earthscan, 2002), p. 33.
- ^{xix} Epistemic communities share a set of causal and principled beliefs, consensual knowledge base, and a common policy enterprise. Peter M. Haas, "Epistemic communities and international policy coordination," *International Organization*, 46, 1, (Winter 1992), p. 18.
- ^{xx} The Commission on Global Governance, *Our Global Neighbourhood* (Oxford University Press, 1995), p. 2.
- ^{xxi} Navroz K. Dubash, Mairi Dupar, Smitu Kothari, and Tundu Lissu, *A Watershed in Global Governance? An Independent Assessment of the World Commission on Dams* (World Resource Institute, Lokayan, and Lawyers' Environmental Action Team, 2001). Independent Report.
- ^{xxii} *The Bonn Keys*, summarized by Margaret Catley-Carson, *Conference Report*, p. 22.
- ^{xxiii} *Ministerial Declaration*, adopted by Ministers meeting in the Ministerial Session of the International Conference on Freshwater, Bonn, 4 December 2001.
- ^{xxiv} Peter H. Gleick, "Coping with the global fresh water dilemma," in Pamela S. Chasek, ed., *The Global Environment in the Twenty-First Century* (Tokyo: United Nations University Press, 2000), p. 212.
- ^{xxv} In 1895 US Attorney General Judson Harmon commented this view with regard to the then US–Mexico dispute over the Rio Grande River. Postel, *Pillar of Sand*, p. 150.
- ^{xxvi} Postel, *Pillar of Sand*, p. 150.
- ^{xxvii} J. A. Allan, "Virtual Water: a Strategic Resource," Editorial in *Ground Water*, 36, 4, (July/August, 1998), p. 546.
- ^{xxviii} World Water Assessment Programme, *Water Security: A Preliminary Assessment of Policy Progress since Rio* (WWAP, 2001).
- ^{xxix} *Vision 21*, WSSCC Website: www.wsscc.org
- ^{xxx} Inge Kaul, Isabel Grunberg, and Marc A. Stern, eds., *Global Public Goods* (New York: Oxford University Press, 1999).
- ^{xxxi} For instance, it is reported that a private consortium led by International Water doubled the water prices in Cochabamba, Bolivia, which resulted riots in 2000. Celine Tan, "The Water Crisis," *TWN Briefings for WSSD*, 16 (August 2002). In contrast, SUEZ reported a successful case, in which the price of water remained less than before the concession was awarded in Buenos Aires. SUEZ, *Bridging the Water Divide* (SUEZ/ONDEO, 2000), p. 12.
- ^{xxxii} Gerald Mestrallet, "The 'Water Truce'," SUEZ, *Bridging the Water Divide* (SUEZ/ONDEO, 2000), pp. 4–7.
- ^{xxxiii} Freshwater Caucus, "Proposals for Additions, Revisions and Inclusion in the Chairman's Text," 27 March 2002.
- ^{xxxiv} Freshwater Caucus, "Civil Society Initiative to Secure Global Access to Freshwater and Sustainable Development," 27 May 2002.
- ^{xxxv} NGO draft opening statement for multi-stakeholders dialogue, PrepCom IV, Bali, 27 May 2002.
- ^{xxxvi} Emanuel Adler and Peter Haas, "Epistemic communities, world order, and the creation of a reflective research program," *International Organization* 46, 1 (winter 1992), p. 375.
- ^{xxxvii} Global Water Partnership Website: www.gwpforum.org
- ^{xxxviii} World Commission on Dams, *Dams and Development*, (London: Earthscan, 2000).