Freshwater

Briefing Paper

Freshwater: A Global Crisis of Water Security and Basic Water Provision

The Ministerial Declaration of the Second World Water Forum in the Hague, Netherlands, (March 2000) set water security as a principal concern for sustainable development in the twenty first century. The global statistics speak for themselves. Approximately one in three people live in regions of moderate to high water stress and it is estimated that two thirds of people will live in water stressed conditions by 2025 (WBGU 1999, UNEP 1999). Human demand and the misuse of water resources continue to grow. Intensive irrigation is placing steadily increasing pressure on aquifers and their ability to recharge, and reported incidences of groundwater and surface water contamination continues to rise. In large cities, total municipal and industrial uses of water have grown by 24 times in the last century and urban populations are expected to grow to 5 billion people by 2025. Some large-scale water infrastructure projects and an intensification and greater frequency of natural threats, such as flooding and droughts, are having a devastating impact on people's livelihood and access to water. These pressures are also placing freshwater ecosystems and their associated species under enormous strain. The critical issues for water security, in terms of the causes and the resultant impacts, are particular to each locality and region of the world (Table 1).

For developing countries the most pressing issue for water security is in meeting basic provision of water supply and sanitation (WSS). 20 % of the world's population still lack access to safe drinking water and 50% lack adequate sanitation, a statistic that has not improved since the end of the eighties international WSS decade. The UN Secretary General's report to the eighth session of the UN Commission for Sustainable Development (CSD) on "the progress made in providing safe water supply and sanitation for all during the 1990's" paints a bleak picture of the present status of WSS provision. Latin America, Asia and Africa are facing the greatest difficulties (Figure 1.).

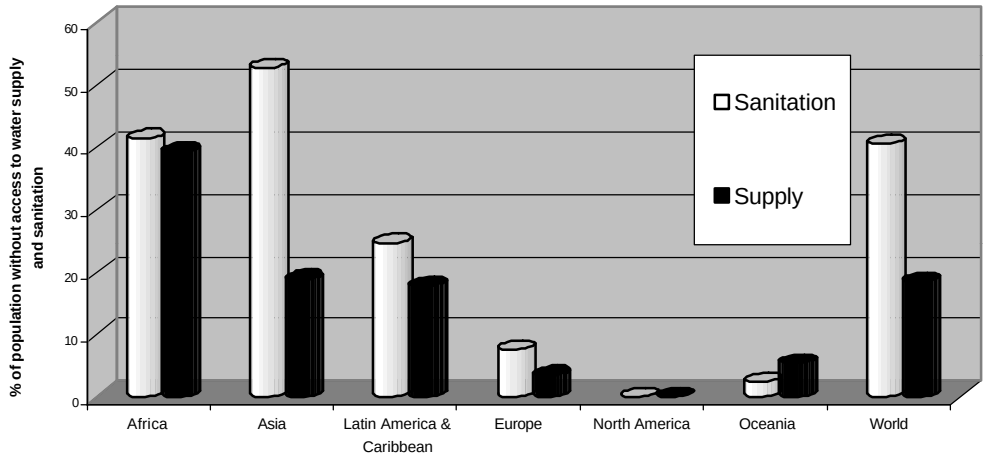

Figure 1. Lack of access to Water Supply and Sanitation by region (ECOSOC, 2000)

Over the last ten years rural sanitation provision in Africa has decreased by 2%, and the low levels of urban water supply and sanitation have hardly improved. Urban water supply in Asia has also fallen since 1990. In Latin America sanitation in rural areas has remained low (Figure 2.). Arid and semi-arid areas, especially in West Asia and North Africa, are likely to be most impacted by increased water stress. Underlying many of these problems is the fact that water is a fixed resource, faced with increasing demand and pressure from competing water uses. The Secretary General's report outlines some key areas of reform, especially toward better WSS coverage and water resource allocation. Some of these aspects are discussed

below with reference to previous meetings, future international process and the drivers for directing water strategies toward more sustainable economic activities and poverty eradication.

Table 1. Regional issues related to global water insecurity

	Key Issues
Asia & Pacific	• Critical health problems: In Asia, one in three people lacks access to safe drinking water. 500,000 infants die each year from diarrhoeal diseases related to a lack of adequate WSS. • Water Pollution: In many countries bacterial waste from human sources exceeds levels recommended in OECD guidelines by ten times. • Overuse: Agriculture accounts for 90% of freshwater withdrawals in South Asia. Aquifer depletion in Asia has led to a drop in water availability per capita from 10,000 m^3 1950 to 4,200 m^3 in 1990's. West Asia faces particular pressure on groundwater resources, withdrawals far exceed natural recharge rates.
Africa	• Poverty and water scarcity: 25 countries will face water stress or scarcity by 2025. Over 300 million lack access to safe water supply. Nearly 51% of people in sub-Saharan countries lack access to safe supply and 41% lack adequate sanitation. 14 countries are already experiencing water stress, another 11 countries are expected to join them by 2025. Approximately 16% of the continents' population (230 million) will be subject to water scarcity by 2025. • Natural variation and a lack of regional basin level planning are exacerbating the uneven distribution of water resources. • Lack of ground water protection from agricultural uses, which makes up 88% of total water use. • Lack of risk preparedness and mitigation: flooding, droughts, storms, displacing human settlements and has chronic health effects e.g. in Mozambique over 1 million people were displaced by the floods (in 1999/2000) and an unknown number killed.
Europe & Central Asia	• Lack of access to drinking water in many parts of Eastern Europe and Central Asia • Increasing water consumption: Demand has grown from 100 km^3 1950 to 560 km^3 in early 1990's. Agriculture accounts for 60 % of water use in the Mediterranean and a further 90% in Central Asia. More than half Europe's cities are over-exploiting groundwater reserves. Industrial and urban uses are 55% of total water use and current levels are expected to double by 2025. • Declining water quality: Many countries report groundwater pollution (nitrates, pesticides, heavy metals & hydrocarbons) impacting watersheds, aquifers & associated biota e.g. Mediterranean, Aral Sea, Scandinavian lakes. Nitrate levels in many parts of western & central Europe exceed max. admissible levels for human consumption (EU Drinking Water Directive).
Latin America & Caribbean	• Groundwater contamination and depletion: Release of heavy metals, nutrients, chemicals and hazardous wastes from mining, agriculture and industry are growing. • Sanitation: Only 2% of all sewage produced in Latin America receives treatment with considerable health and environmental risks e.g. Cholera and Typhoid outbreaks. • Conflict over access and use of water: many national water policies fail to incorporate integrated approach to management environmental limits or rights of access to water, and lack coordination between regulatory agencies.
North America	• Aquifer depletion: demand on water resources, especially from fossil stores, has steadily increased due to population growth, municipal, expansion of irrigation and industry e.g. cotton farming in Texas and New Mexico have reduced water supplies. Canada and USA are the largest per capita users of water globally. • Water pollution: agrochemical runoff and non-point sources of water pollutants have contaminated many ground and surface waters. Mercury, PCBs, DDT traced in fish have led to warnings about fish consumption.

Sources: WBGU (1999), GEO 2000 (1999) & ECOSOC (2000).
* Adequate access: 20 litres per person per day from a source located within 1 km of user's dwelling.
* Water stress : less than 1700 m^3 per capita per year (OECD 1999)

1. Decentralisation of Governance

"*without the fullest participation of people at all levels of society the goal of full coverage (of WSS) is unlikely to be obtained*" Secretary General's Report to CSD 6 (2000)

At the Dublin International Freshwater Conference in 1992, and at numerous proceeding meetings, the principle of subsidiary has been advocated, where management of public water supply, irrigation and water resource should occur at lowest appropriate level. The Hague Declaration indicated further ministerial support for devolution of governance, enhancing role of local authorities, industries, NGOs and individual citizens in water regulation, monitoring and planning. Crucially government role is not reduced, and remains pivotal in supporting local inclusion e.g. education/capacity building, monitoring and in producing enforceable regulations, as well as supporting transboundary collaboration between regions and other states. Local Authorities can encourage community involvement e.g. through consultative processes and public meetings, with planning incorporated into a wider water and land use context. Industry has an increasingly vital role in water and sanitation provision, technical/productive efficiency and support of local communities via employment, income generation projects and developing partnerships with public and water projects. Voluntary codes of

practice and initiatives can enable industry to take a more pro-active position, going beyond the minimum legislative requirements in support of sustainable water practice. NGO's traditional role for community support can be greatly developed. For example supporting innovative mechanisms for local financing of water projects; capacity building; promoting blue funds; awareness building in general; promoting good research through social venture capital; reality checks on water data; and through participation in decision making at a variety of levels.

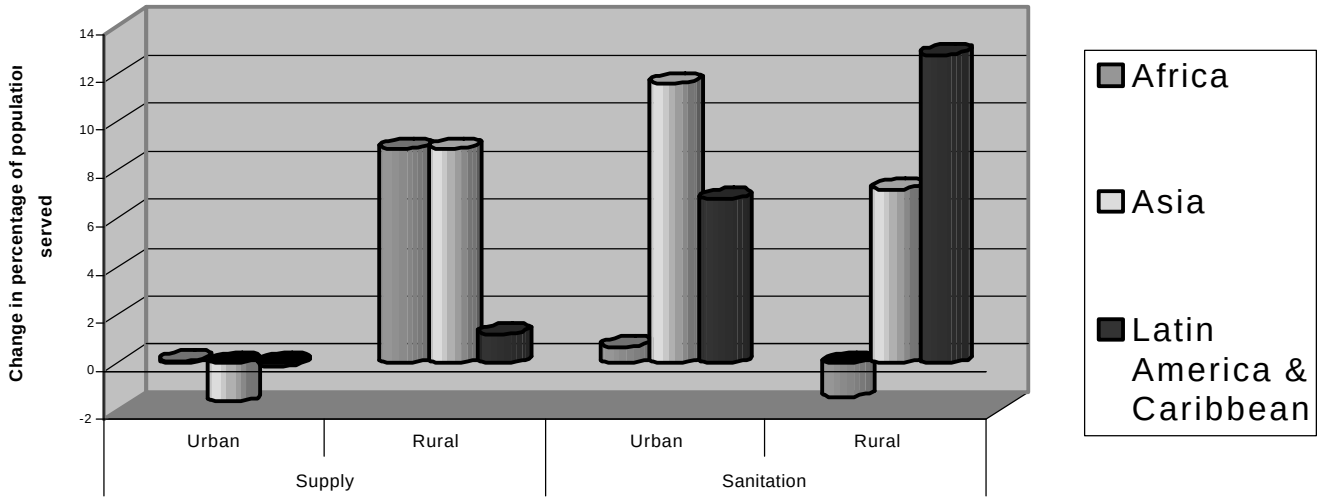

Figure 2. Change in Water Supply and Sanitation for Africa, Asia, Latin America/Caribbean, 1990-2000 (ECOSOC, 2000)

2. Community Empowerment

At 1998's sixth session of the CSD it was agreed that governments need to formulate goals for involving communities in water management. Rights, responsibilities and roles need to be defined within a broad institutional framework for participative planning and management at all levels and across all sectors. Furthermore, to increase community effectiveness as "agents for change" there needs to be strategies for enhancing awareness, technical, managerial, administrative capacity via training, education, publicity campaigns. Governments, NGOs, and other public and private bodies will all have a role in supporting greater community involvement in WSS strategies. International task masters UNESCO, DESA, as well as UNEP, OECD and other international organisations were identified as critical for raising global awareness on the importance of WSS.

The importance of gender was raised at UN General Assembly's Special Session (UNGASS, 1998) and the Second World Water Forum (SWWF 2000) where it was recognised that particular attention should be paid to the role, skills and needs of women (along with indigenous communities) as critical actors in safeguarding and monitoring water resources. WSS programmes show links between greater female participation to higher coverage, better management and lower incidence of water related diseases. There is therefore a need to enhance WSS programmes with gender focused capacity building, education and training in administration, management strategies, as well as developing mechanisms and indicators for gender participation in decision making.

3. Service Provision: Rural and Urban Challenges

Requirements for water to better sustain people's livelihoods clearly differs between rural and urban areas. However, central to better distribution and provision, along side devolved governance, is the increased recognition of the importance of water as a productive element. As well as supporting basic needs, it plays a key role in sustaining development. Not only in socio-economic terms, with the production of food (cereal, fisheries) and a whole range of other goods and services (manufacturing, power generation, textiles etc), but also in supporting ecosystem functioning and species (WWV 2000).

Governments and local authorities need to ensure policy targets and programmes meet all these ends, toward maximising development aims. This means not only in terms of upgrading infrastructures to improve operation and maintenance for basic WSS, but also through better internalisation of social and environmental externalities from other

water uses e.g. regulating production inefficiencies and improved cost recovery. Private enterprise may assist this process with the adoption of water efficient technology, administration and management practices. Traditional and small-scale water use practices may be more sustainable, cost effective and efficient than new, mammoth installations or "technocratic" approaches, therefore public/private planning, implementation and management processes need to take place in open consultation with local water users to weigh up the costs and benefits of alternative approaches. Authorities need to ensure that the poorest are fully reflected in decision-making through the better definition and communication of rights of access and frameworks for community involvement.

4. Information management

Six years after Noordwijk (Ministerial conference of drinking water and environmental sanitation, 1994) assessment and up-to-date baseline data about the status of WSS provision and water resources, including identification of problems and constraints to provision, is still lacking. Nationally, governments have a role in collating and promoting good practice, supporting on-going research and monitoring programmes. Monitoring and modelling of water resources assists more targeted policy decisions by developing baseline data about the physical status of surface and ground water, identifying those areas where water resources are critically threatened, or may be at risk from human conflict/natural pressure. There needs to be further research into the causal links between water provision and poverty to assist more targeted poverty elevation strategies. Internationally and regionally a number of monitoring and information provision programmes exist e.g. International Hydrology Programme (UNESCO), Joint Water Supply and Sanitation Monitoring Programme (WHO, UNDP, UNICEF), Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities (UNEP). Much of this work could be collated and reviewed in a biennial World Water Development Report produced by the UN ACC sub committee for freshwater resources (SWWF 2000).

5. Education and awareness

At the International Conference on Water and Sustainable Development in Paris (1998) ministers agreed to improve knowledge and information exchange through technology transfer, education, and training particularly to enable the involvement of poor, disadvantaged, indigenous communities, youth, local authorities and NGO's. Education, in hygiene and more generally, is an essential prerequisite to better health and sanitation, as well as water use. Education and better access to information are also important components for empowering people to take greater responsibility over their water use, giving people the skills to self regulate and monitor water resources. This should cover formal and informal mechanisms e.g. through all levels of schooling and via the media. At a local level authorities can work with and support local community surveillance networks (e.g. water user associations, river associations etc).

6. Financial and Economic Mechanisms

World Bank recently estimated that $600 billion investment in WSS infrastructure implementation would be necessary to reach full WSS coverage. The World Summit on Social Development (1995) stated that 20% of public expenditure and 20% of national aid budgets should be allocated for provision of basic services. Governments remain the principle financial source for WSS provision. Current global estimates of annual expenditure for WSS from governments is US$50 billion, the private sector US $15 billion, international donors US $9 Billion, and from foreign direct investment at US $ 4 Billion (Cosgrove & Rijsberman 2000). Economic and legislative instruments can produce additional finances, however appropriate and effective regulation, monitoring and better cost recovery by authorities is necessary to ensure that these funds are reinvested into WSS and water-related programmes. Foreign and domestic private organisations and donors should be encouraged to support and supplement these activities. The GEF Water Programme (under UNDP, UNEP and World Bank) plans to inject US$ 0.5 billion over the next five years for international waters projects in developing countries and economies-in-transition. Such programmes need to ensure aid is linked into strategies for poverty eradication and sustainable water consumption.

7. Integrated Water Resource Management (IWRM)

Since the Mar del Plata conference (1977) IWRM has been advocated widely as the most sustainable means to incorporate the multiple competing and conflicting uses of water resources. Governments are to develop and implement National Sustainable Development Strategies (NSSDs) by 2005. NSSDs should clearly include integrated plans, at the watershed level, for sustainable water resource use and management. Local participation, cross-border collaboration over shared water courses, and coordination with strategies for land use management are also vital elements of IWRM. All of which require adequate provision for financial, technical and human support, along with political will (UNGASS 1998).

For several countries these strategies will require international support to be able to develop effective management tools for more integrated approaches. One of the institutions involved in the Second World Water Forum was the Global Water Partnership (GWP). The Framework for Action Unit of the GWP aims to develop toolkits along with regional and national Technical Advisory Committees working toward achieving IWRM. Such activities should incorporate approaches from different sectors (environmental, technical, community, financial, legal, collation and dissemination of information, advocacy) that are relevant to the specific needs of different regions and localities.

The Way Forward

There are a number of positive regional examples of movement toward better WSS and water resource management (Table 2). Regionally, Asia and Africa will need far greater international support to meet even basic levels of water provision and poverty elevation, in terms of developing management frameworks and implementing strategies to reduce water stress.

Table 2. Examples of regional action

Region	Actions
Asia & Pacific	• International commitment: over 75% of countries have signed CBD, 50% signed CCD and Basel conventions, less than 50% countries have signed Ramsar. • Shared water resources: Mekong River Commission (Cambodia, Lao People's Democratic Republic, Thailand, Vietnam & China observing) coordinates the use and development of the lower watershed & an environmental support unit monitors the area. • Participation: Local people and NGOs more widely consulted in National Environmental Action Plans e.g. Thailand government, Indian Government Environmental Monitoring System Network collects, analyses and disseminates environmental data, including freshwater resources.
Africa	• International commitment: over 75% of countries have signed CCD, 50% of African countries have signed Ramsar, less than 50% have signed Basel convention. • Economics: 22% of GEF goes to Africa, 38 % of this to water programmes. ODA is declining • Shared resources: Inter-agency land/water programmes are developing e.g. South African Development Community (SADC) protocol for shared water course systems aims to ensure better equity and resource sharing between riparian states (to be ratified). African ministerial Conference on Environment (Cairo 1985) set up a committee for river and lake basins. • Participation: SADC's environmental education centre in Umgeni Valley (South Africa) undertakes education and training programmes for communities.
Europe & Central Asia	• International commitment: over 75% of countries have signed CBD, UNFCC, and Ramsar, 50% of countries have signed CCD. • Operations and maintenance: regulation of water pollution e.g. EC Urban Waste Water Treatment directive (91/271/EEC), Nitrates Directive (91/676/EEC). • Shared resources: e.g. Convention of the Rhine against Chemical pollution, Helsinki Convention on the Protection & use of Transboundary Watercourses & International Lakes. • Economics: EU cohesion fund include water sanitation, nature conservation and waste water treatment elements for countries of GDP less than 90% average. • Participation: wider legislation and infrastructure has developed in many Eastern European countries e.g. Poland, Hungary, Czech Republic, Slovenia
Latin America & Caribbean	• International commitment: all countries have signed CBD, more than 75% of counties have signed CCD and Basel convention, less than 75% have signed Ramsar. • Economics: Mexico, Colombia, Uruguay and most Caribbean countries charge for effluent discharge and drinking to encourage better quality and quantity control . • Shared resources: Regional agreement on the Transboundary Movement of Hazardous Wastes (Panama 1992), La Plata river basin treaty (Brasilia 1978). • Governance and Participation: Brazil has a National Law of Hydraulic resources which includes watershed committees and agencies to ensure integrated water policies with public participation. Chile has National system of Environmental information (1994)
North America	• International commitment: Canada has signed CBD, CCD & Basel convention. US & Canada have sigend Ramsar • Ecosystem protection: Canada has Accelerated Reduction/Elimination of Toxics programme to reduce persistent, bio-accumulative and toxic substances by 90%. • Shared resource: Canada- USA Agreement on Transboundary movement of Hazardous Waste (1986) • Participation: US Clean Water Action Plan (1998) supports the participation of local communities

Source: GEO 2000 (UNEP 1999)

Transitional countries in Europe and Central Asia need support in the adoption and enforcement of EU water directives, particularly regarding pollution control and urban water demand management. More generally in Europe there is a need to develop and strengthen green taxation of water pollution, reduce perverse subsidies, and build enterprise capacity for environmental management systems.

Latin America & Caribbean needs to develop economic instruments to meet funding gaps for national water legislation, regulatory institutions and monitoring systems, including legal instruments to overcome land tenure issues at the community level. With better "ring fencing" of such approaches, WSS and water management infrastructures can be further developed and education and information strategies developed.

In North America excessive water use from inefficient practices will require greater institutional accountability at all levels. The US has fairly extensive national laws but these may need to be better linked to other regulations, and it still has not signed international agreements on control of hazardous wastes and biodiversity. The challenges are considerable and each sector will have to face greater roles and responsibilities to meet those challenges (Table 3).

Table 3. Institutional Roles and Responsibilities

Institution	Examples of key activities
Local authority	With a move to devolved decision-making, authorities will take an increasingly important role as implementers of water strategies. This brings with it greater responsibility, not only to ensure adequate and equitable WSS provision and water resource allocation but also, enabling community involvement to produce more integrated, accountable and realisable plans.
Private sector	The private sector has a direct role to play, in terms of contracted, private or public limited service provision and indirectly, as a major water user. Key responsibilities of the sector will be to maintain accountable and transparent practices (not only to regulators, shareholders and consumers but also to public as a whole), as well as incorporate sustainable principles of water management, e.g. implementation of Environment Management Systems, strategies for Social Corporate Responsibility.
NGO	The roles of NGOs crosses local to international realms, acting as advocates, calling institutions to account but also in supporting development of solutions for more integrated water strategies. Their key responsibilities lie in relaying information to/ from communities/relevant groups, ensuring that such groups are able to understand policy implications so that they are better equipped to actively participate.
Government	At a national level, governments should regulate and facilitate the process of devolved WSS provision and water resource management. It will be their responsibility to provide the enabling environment for local implementation (legislative, financial, human and technical capacities), as well as to develop and implement frameworks and regulatory mechanisms in support for participative and integrated processes across departments and regions. Internationally, governments need to take responsibility for linking water with wider priorities. This includes enacting transboundary watershed agreements and related environmental conventions, exchange of information and technology, as well as (human, financial. technical) support for those countries less able to adopt sustainable water strategies.
International Institutions	Roles of the UN, Bretton Woods and other institutions range from technical/financial support, monitoring, conflict resolution, information dissemination and facilitation in formulating national IWRM and sustainability strategies. It is a crucial responsibility to pull together the activities of different institutions in a way that lessons can be shared and improved upon e.g. through the ACC Subcommittee on Water Resources, whose member organizations include: DESA, ECA ECE, ECLAC, ESCAP, ESCWA, FAO, HABITAT, IAEA, the Secretariats of UNCBD UNCCD, UNFCCC, and IDNDR, UNDP, UNEP, UNESCO, UNHCR,UNICEF, UNIDO, UNU,WHO,WMO and World Bank.

Sources: WWC (2000), GWP (2000), ECOSOC (2000)

At the SWWF ministers agreed an international process with regards to target setting for WSS and sustainable water practice. Governments will need to develop the drivers for meeting these targets i.e. finance, technical, human, legislation. The progress of national programmes for the implementation of IWRM practices will be presented at the International Water Conference in Bonn, December 2001 (Dublin + 10). National Strategies for Sustainable Development (NSSDs) are to be presented in advance of Earth Summit 2002. These should include strategies for how countries will improve water resource use and practice. The UN ACC Subcommittee for Water Resources is likely to play a key role in monitoring of progress of all these processes through the first World Water Development Report (to be produced for Bonn). Utilising sustainability indicators for water, such as those defined at CSD 1998, would assist monitoring the use of these drivers and progress toward meeting targets (Table 4).

The two overarching objectives of sustainable development, poverty eradication and sustainable production and consumption, are clearly not being met in terms of freshwater priorities, especially in relation to WSS. Without identify-

Table 4. Sustainability Indicators for Freshwater

	Type	Example indicators
Economic	**Expenditure**	Public/private expenditure on water abstraction, treatment and distribution, health services, planning, management, regulation, review.
	Investment	Level of investment (from ODA, FDI, domestic public/private sources) in income generation programmes and water infrastructure development, especially directed toward poorer communities.
	Institutional	Resources invested in cost recovery, enforcement and penalisation for water regulation. Reinvestment of taxation into water sector.
Environment	**Quality**	Concentration of faecal coliform in freshwater, Biochemical Oxygen Demand in water bodies. Degree of implementation of Multilateral Environment Agreements e.g. Ramsar, Basal conventions.
	Consumption & efficiency	Level of water consumption by sector, domestic consumption of water per capita, foreign and domestic technology transfer. Groundwater reserves; annual withdrawals of ground and surface water
	Institutional	Trans-national, national and sub-national river basin action plans
Social	**WSS provision**	% Population with access to safe water, adequate sanitation, health services (including health education).
	Poverty	% Population without access to WSS living below poverty line in rural/ urban areas.
	Institutional	Degree of local level water resource management, capacity building/education, participation in policy and legislation.

Sources: UNCED (1992), World Bank (1998), ECOSOC (1998)

ing and implementing more linked up strategies toward poverty reduction and WSS provision, developing countries will be subject to increasing hardship for an ever growing number of people and ecosystems subject to increasing water stress. For more developed countries, widespread adoption and support for mechanisms to reduce polluting production and over-consumption of water resources requires greater political will to greatly develop the incentives for better use.

Water is an element that is fundamental to so many aspects of life and of the surrounding natural environment. The fact that it cuts across so many areas relating to sustainable development poses considerable challenges. Institutions and individuals will need to look more collectively at these critical issues, through international, regional, national, and local water strategies, so that when they come together at Earth Summit 2002, it is with a fuller understanding and a commitment to thinking ahead, ready to take the next steps toward the sustainable achievement of global water priorities.

Key literature and links:

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Related Conventions

UN Convention to Combat Desertification (CCD):
http://www.unccd.de
Convention of Wetlands of International Importance, especially as water fowl habitat (Ramsar):
http://iucn.org/themes/ramsar/
UN Convention on Biological Diversity (CBD) :
http://www.biodiv.org
UN Framework Convention on Climate Change (UNFCCC)

http://www.unfccc.de/

Key Organisations

UN Administrative Committee on Coordination (ACC) Subcommittee on Water Resources. Mr. Manuel Dengo, Secretary, ACC Subcommittee on Water Resources, DSD/DESA, United Nations Headquarters, Room DC1-864, New York, N.Y. 10017, United States; Tel/Fax: +1 (212) 963-4208/4340; E-mail: dengo@un.org

UN Commission for Sustainable Development secretariat. UN Division for Sustainable Development (UNDSD) New York, NY 10017 USA; Tel: + 1 212 963 3170; e-mail: aydin@un.org; web site: http://www.un.org/esa/sustdev/water

Water Supply & Sanitation Collaborative Council (WSSCC) c/o World Health Organisation, 1211 Geneva 27, Switzerland, Tel/Fax: + 41 22 791 3544/4847, http://www.wsscc.org

World Water Council Secretariat, 10, place de la Joliette, Atrium 10.3 13304, Marseille Cedex 2, France, Tel/Fax: +33 4 91994100/101, http://www.worldwatercouncil.org

Global Water Partnership, GWP secretariat c/o Sida, Stockholm, S-105 25, Sweden, Tel/Fax: +46 8 698 5000/5627 http://www.gwpforum.org

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* Forthcoming Environment Paper: Climate Change and Energy *

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