

Management of transboundary water resources: lessons from international cooperation for conflict prevention

JUHA I UITTO* AND ALFRED M DUDA†

*United Nations Development Programme/Global Environment Facility, 304 East 45th Street, New York, NY, USA

E-mail: Juha.uitto@undp.org

†Global Environment Facility, 1818 H Street, NW, Washington, DC, USA

E-mail: aduda@worldbank.org

This paper was accepted for publication in September 2002

Tensions over freshwater resources may become more frequent as pressures on water resources grow due to increased demand and variability of rainfall. Conflicts may take place between or within countries or between competing sectoral users. This paper focuses on institutional approaches for enhancing cooperation between countries for sustainable development of transboundary freshwater bodies and contributing basins. It is assumed that instead of being zones of conflict, shared water resources can provide a basis for cooperation and benefit-sharing provided that threats to the international waters are recognized and collaborative structures are created. The paper draws upon experiences gained within the international waters focal area of the Global Environment Facility, the main funding mechanism for countries to support the environmental management of transboundary water resources. Lessons for promoting peaceful cooperation for environmental management, benefit-sharing and sustainable use of transboundary freshwater resources are highlighted through examples from Africa, Central Asia and Latin America. Experience shows the importance of processes that bring together all sectors and actors whose actions affect the transboundary waterbody at regional, national and local levels. The development of a science-based diagnostic analysis is essential to identify the threats to the transboundary ecosystem and to break down the issues into manageable parts with the aim of developing a strategic action programme. Ensuring political commitment that can result in institutional, policy and legal reforms in the countries concerned is the key to sustainable development of the transboundary resource.

KEY WORDS: transboundary water resources, Aral Sea, Bermejo River, Lake Tanganyika, Global Environment Facility, conflict prevention

Introduction

With increasing frequency, conflicts over water resources may create unrest as water resources become scarcer due to growing water demand concomitant with increased precipitation variability associated with global climate change. The conflicts may take place between countries, between sub-national governments within countries or between competing sectoral users or groups within countries. The

situation is further complicated by the fact that a large portion of major freshwater basins in the world fall within the jurisdiction of more than one nation. Although the number of river basins that can be classified as international depends partly on the definition, and their number has increased recently as newly independent countries emerge, there are some 261 international river basins covering 46% of the planet's land area. Nineteen of these basins are shared by five or more states (Wolf *et al.* 1999).

This paper focuses on institutional approaches for enhancing cooperation between countries for the management of transboundary freshwater bodies and contributing basins to support the transition to sustainable development. The assumption is that shared water resources can actually provide the basis for cooperation and sharing of benefits, rather than conflict, provided that the threats to the international waters are objectively recognized and institutional structures for collaboration are created. The essence of the argument is that cooperation among countries and between the various actors within each needs to be based on solid science and a factual analysis of the problems and opportunities, their potential solutions and shared benefits arising from the alternative solutions. This analysis can be used as a basis for setting priorities, fostering civil society participation, and making political decisions within and between the countries concerning the needed actions to resolve conflicts or pursue opportunities for benefit sharing.

This paper draws mainly upon experiences gained within the international waters focal area of the Global Environment Facility (GEF). Much information is derived from recent evaluation studies carried out under the Facility's auspices, in which the authors have been involved (Ollila *et al.* 2000; Bowers and Uitto 2001). Challenges facing transboundary freshwater resources, including the potential for conflict, are outlined in the article. The roots of collaborative arrangements around international waters are examined, mainly in Europe, North America and Africa, and lessons are identified that can be applied to the management of similar resources in developing countries and countries with economies in transition. These lessons have formed the basis of the GEF Operational Strategy for international waters that was adopted in 1995. The paper describes this GEF strategy of utilizing joint fact-finding processes that link scientific understanding to policymaking. Finally the paper provides an overall assessment of GEF experiences based on its first ten years of operations. Key lessons are highlighted for promoting peaceful cooperation for environmental management, benefit sharing and sustainable use of transboundary freshwater resources through concrete GEF examples from Central Asia, Africa and Latin America.

Transboundary waters and their growing conflicts

Freshwater scarcity related to both water quantity and quality is increasing on a global scale. The main determinant of this scarcity is the increasing water use by a steadily increasing world population. Although on a global scale population growth is

showing signs of slowing down, the world population is still expected to grow, from the present 6 billion, by more than 50% to more than 9.3 billion in the coming half century according to the United Nations medium-variant projections (UN 1997a). Such growth alone is currently placing a tremendous strain on freshwater resources. At the same time, while economies grow and people are getting wealthier, per capita water use grows significantly.

The main consumer of freshwater is irrigated agriculture. As the need to grow more food increases and the possibilities for expanding the farmed area are limited, the only solution is to increase the yields per area unit. This can only be done through the use of high-yielding crop varieties that are dependent on agricultural chemicals and irrigation water. About 70% of all water withdrawal globally is due to irrigated agriculture, which only represents 17% of the total area under agriculture but produces 40% of the world's food. It is likely that water availability will in the near future limit food production potential, at least regionally (Uitto 2000).

In fact, estimates from the World Water Commission (2000) suggest that water withdrawals for all sectors may increase by 50% over existing diversions for various sectoral uses. This will create a disaster at freshwater/marine interfaces where flow reductions will impair ecological functions and saltwater intrusion into groundwater will be excessive. Already, recognition of ecological damage from flow reductions has been raised as a concern in transboundary systems such as the Amu Darya and Syr Darya leading to the Aral Sea, the Colorado River and the Gulf of California, the Tigris–Euphrates system and the coastal wetlands of Mesopotamia, the Dead Sea and Jordan River, the Ganges and its delta at the Sunderbands wetland, the Rio Bravo/Grande and the Gulf of Mexico, and more locally in the Yellow River delta, Tarim Lake in China, and Lake Chapala, the largest lake in Mexico.

Increased pollution loading from cities, industries, agriculture and mining also create conflicts in use. Pollution from agriculture, industry and the growing cities negatively influences the availability of clean water for human consumption. Today, about half of the world's population lives in urban areas, many of them in the fast growing and unplanned mega-cities of the developing world. The consequences of this urban growth on water resources are tremendous (Biswas 2000). Water is unusable in many countries and massive investments will be necessary.

Freshwater resources are unevenly distributed over the surface of the Earth. Drylands cover more than one-third of the world's land area, notably in Africa, the Middle East and Central Asia. With

overuse of marginal areas, land degradation and concomitant water scarcity are spreading. Global climate change will also affect rainfall patterns. The models show that changes in climate could exacerbate periodic and chronic water shortages, especially in arid and semi-arid regions (IPCC 2001). These are the same areas where population growth is amongst the highest in the world, including the politically volatile Middle East. The United Nations estimates that some 460 million people are already living in countries affected by high water stress due to excessive water withdrawals (UN 1997b). By the year 2025, it is estimated that two-thirds of the world's people will live in areas that are subjected to moderate to high water stress if the current trends in water consumption growth continue unabated.

Understandably, therefore, there is a growing literature suggesting that conflicts around water resources will increase dramatically in the years to come and may even lead to war (Renner 1996). However, while undoubtedly resource scarcity has motivated wars, historical or contemporary evidence does not support the notion that major wars have been fought over water resources (Homer-Dixon 1999). On the contrary, there is evidence that water may also become the unifying resource around which countries cooperate. In addition, the downstream water environment and poor citizens depending on it for livelihoods and survival are the first to feel the effects, as noted below. This environmental damage has the potential to alert the world community to the degradation occurring and to mobilize opinion within the relevant nations to reverse the situation through collaborative actions, so that worse conflicts may be avoided.

Transboundary lessons from the north and south

As water resources management touches upon sovereignty of countries over their natural resources, the issues can become politically sensitive. Most people understand that water is essential for practically every sector of society and the demands of each can be very different and often conflicting. For instance, energy production from dams can conflict with environmental and navigational needs in rivers. With lack of attention to protection of the water environment and lack of reforms in water resources management, localized, national problems have now grown to transboundary proportions with downstream environmental degradation being the early warning signal for future conflict.

Experiences in the North in addressing these transboundary water and environmental problems have demonstrated that their solution can take a

great deal of time. The North American Great Lakes and the Rhine Basin countries each used multi-country commissions in the 1950s to study shared environmental problems. These studies, and the subsequent implementation of significant actions, took some 20–30 years, with a series of three revisions in treaties for the North American Great Lakes (Duda 1994) and an additional three successive treaties for the Rhine Basin. On the maritime side, over 25 years have elapsed since regional conventions were signed to promote improved environmental management of the North Sea, the Baltic and the Mediterranean. Significant implementation action is still needed on the key issues and the Mediterranean has been noted for its focus on research and study rather than action.

In the South, particularly Africa, the success of multi-country basin institutions has been disappointing, as noted in the analysis for the World Bank by Rangeley *et al.* (1994). Governance has often been weak, capacity inadequate and a sense of commitment lacking. Over 80% of the land area of sub-Saharan Africa is located in transboundary watersheds, with over 50 international river basins. Even when conflicts have been avoided by agreements, environmental and social considerations have been neglected, as noted by the World Commission on Dams (2000). However, indications are good that a number of African nations are now committed to cooperate in the future since the adoption of a Revised Protocol on Transboundary Watercourses by the Southern Africa Development Community nations in 2000. It remains to be seen whether application of the lessons from the early multi-country arrangements in the North can deliver similar results in developing countries, and those with economies in transition, within similar timeframes.

While a discussion of global agreements pertaining to water resources management and the examination of their origins are outside the scope of this paper, and have been reviewed by the authors elsewhere (e.g. Duda and La Roche 1997; Uitto 2001), initial lessons that have been learned are pertinent. As noted by Duda (1994) and Duda and La Roche (1997), the lessons learned through the early 1990s include the following. Gaining effective commitments on incorporating environmental considerations into transboundary water resource management takes many years and much patience. Strategic joint fact-finding among participating nations can serve as an important catalytic tool for developing political buy-in and participation of different nations and interests in each nation. This may be enhanced if official inter-ministerial committees of national and sub-national governments in each country are involved in the joint institutions to

undertake the work instead of developing a supranational international organization to do the work for the countries. In addition, the process of jointly producing such a 'study' or analysis fosters participation of the science community and creates an initial product that may be used to begin participation of civil society in the processes. Active participation in joint fact-finding is then a key first step among nations and among sectoral interests in each nation. In addition, a planning process for determining what strategic actions the nations will collectively undertake is essential for initiating on-the-ground joint action. Formulation of this product also provides an instrument for civil society participation. Finally, inclusion of a political commitment to action in writing and to establishment of institutions to periodically review progress of collaborating countries in undertaking their joint actions is fundamental to progress.

The Global Environmental Facility and international waters

The GEF was established in 1991 as a pilot programme with the objective to forge international cooperation and finance actions to address threats to the global environment (<http://www.gefweb.org>). The role of GEF was to test innovative approaches and to pilot projects in these areas. In 1994, GEF was restructured as a permanent financial mechanism (Sjöberg 1999). The facility is open to participation by countries from both the North and the South (currently 173 countries are members). GEF was established through the partnership of the United Nations Development Programme (UNDP), United Nations Environment Programme (UNEP) and the World Bank, acting as the three GEF implementing agencies. The Facility also encourages cooperation between the various sectors, including governments, civil society and the private sector. Following the restructuring, the GEF Council adopted the GEF Operational Strategy in 1995 that defines the strategic framework for action for the Facility in its four focal areas: biodiversity conservation, climate change, international waters and ozone depletion (GEF 1996). Projects addressing land degradation are also eligible for GEF funding, provided that they relate to one or more of the focal areas. According to the operational strategy, GEF will fund projects and programmes that are country-driven and based on national priorities designed to support sustainable development (Duda and El-Ashry 2000).

In the area of international waters, countries often face complex water-related environmental problems that are transboundary in nature. GEF contributes primarily as a catalyst to the implemen-

tation of a comprehensive, ecosystem-based approach to managing the transboundary waters and their drainage basins as a means of generating global environmental benefits. The GEF implementing agencies assist countries to find means of collaborating with neighbouring nations in order to change the way human activities are undertaken in the different economic sectors that place stress on the water environment, so that transboundary conflicts and environmental problems can be resolved. The goal is to help each of the countries use the full range of technical, economic, financial, regulatory and institutional measures needed to operationalize sustainable use strategies for transboundary waterbodies and contributing basins.

To be successful in addressing these transboundary problems, the GEF Operational Strategy recognized that a series of international waters projects may be needed over time to:

- build capacity and political commitment of countries to work together;
- jointly understand and set priorities based on assessments of environmental conditions in waterbodies;
- identify actions to address the highest priority transboundary problems; and
- implement agreed regional and national policy, legislative and institutional reforms, and attract the priority investments needed to address them.

By the end of 2000, GEF had provided support to 41 full projects and four medium-sized projects in the international waters focal area. To date, 11 of these projects have been completed. In addition, project development funds have been approved for 22 projects which may enter the GEF portfolio upon further development. Not including co-financing, overall GEF funding to international waters efforts from 1991 to the end of 2000 totals US\$444 million. Figure 1 shows the regional distribution of the projects. The number of projects, rather than the amounts of GEF funding, gives a good indication of the governments' commitment to work together on transboundary basins in each region.

Typically, GEF assistance to countries to deal with international waters issues starts with an initial strategic project involving the collaborating nations in the basin. The countries often establish country-level inter-ministerial committees to participate in the projects and frequently start out by examining scientific information on the ecological status and sectoral uses of the waterbody or transboundary basin. This analysis is ideally collated into a transboundary diagnostic analysis, or TDA, that reflects participation of both the science and management

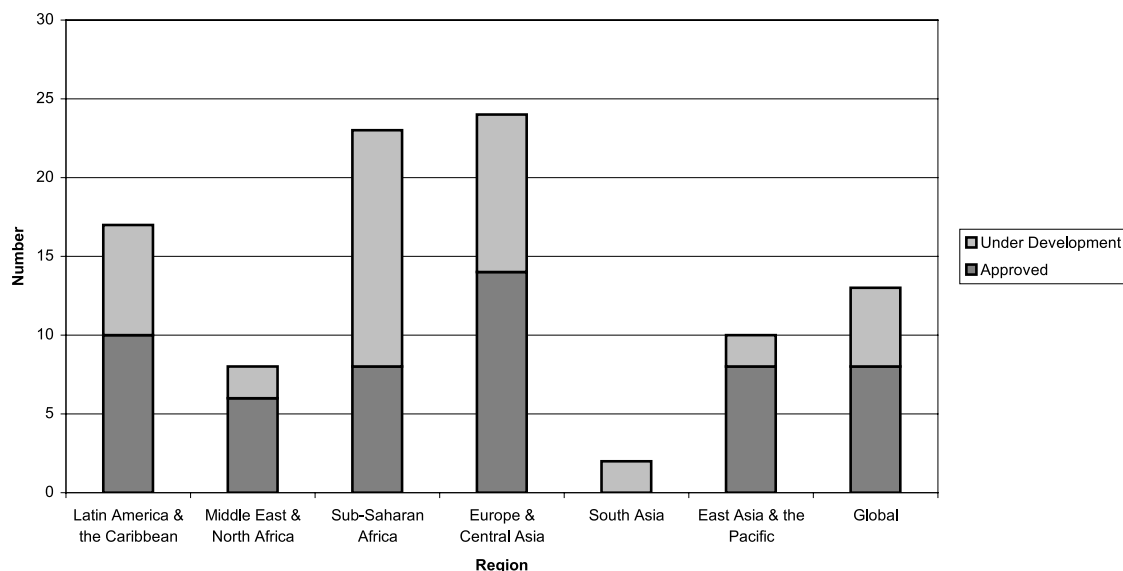


Figure 1 Number of approved GEF projects and projects under development within regions

Source: Bewers and Uitto (2001)

communities in the countries. The aim is to produce a science-based assessment of the key transboundary problems and their root causes. This way a factual process can assist the countries and different stakeholders to become cognizant of the top priority transboundary concerns and to focus politically on just several key issues.

Through political processes, the countries can then establish priorities and agree to work on them individually and jointly. The complex situations can be divided into smaller, manageable ones with a series of country-specific actions needed for their resolution. This helps to provide focus to multi-country collaboration. These country-specific reforms and investments for addressing the priority problems are then compiled into a strategic action programme, or SAP. If the countries are willing to enact the reforms and make the needed investments, GEF may then support the implementation work alongside other funding sources. While other types of projects addressing limited demonstration activities or building capacity of countries are also eligible under the Operational Strategy, the majority of the international waters projects have followed the initial strategic approach described above.

Early GEF experiences in international cooperation

A recent review focused on a systematic examination of multi-country implementation arrangements in GEF projects involving waterbodies shared

between two or more countries (Ollila *et al.* 2000). The objective was to identify emerging lessons about what kinds of multi-country approaches have worked, what have not, why and under what circumstances. For activities that require joint efforts and commitments by more than one country, what characteristics of project design and inter-institutional collaboration processes and structures facilitate effective decisionmaking and implementation of transboundary actions?

A total of 36 projects were included in the review, including 28 projects from the international waters portfolio. The remaining projects focused on biodiversity protection in the context of transboundary waterbodies. The projects were studied through a thorough review of existing documentation and reports, as well as a questionnaire survey. In addition, ten of the projects were included in an in-depth study, the majority of which were also subjected to site visits by the study team. The projects reviewed included both marine and freshwater projects. This paper focuses on the experiences and early lessons from the GEF projects dealing with freshwater basins shared by two or more countries (Table 1). Key features of several case studies are included below as examples to highlight the early lessons.

Lake Tanganyika

The multi-country Lake Tanganyika project was designed in the early 1990s as one of the first GEF

Table 1 Freshwater basin projects included in the multi-country institutional arrangements review

Countries involved	Project title
Kenya, Uganda, Tanzania	Lake Victoria Environmental Management Project
Malawi, Mozambique, Tanzania	Lake Malawi/Nyasa Biodiversity Conservation Project
Burundi, DR Congo, Tanzania, Zambia	Pollution Control and Other Measures to Protect Biodiversity in Lake Tanganyika
Bosnia-Herzegovina, Bulgaria, Croatia, Czech Republic, Hungary, Moldova, Romania, Slovak Republic, Slovenia, Ukraine, Yugoslavia	Developing the Danube River Basin Pollution Reduction Programme (three successive projects)
Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan	Water and Environmental Management in the Aral Sea Basin
Argentina, Uruguay	Environmental Protection of Rio de la Plata and its Maritime Front: Pollution Prevention and Control and Habitat Restoration
Argentina, Bolivia	Strategic Action Programme for the Binational Basin of the Bermejo River

projects. The East African lake is the second deepest lake in the world, with globally significant biological diversity (Uitto 2002a). UNDP took advantage of early experiences in facilitating the Danube and Black Sea basin projects to apply some of the principles in assisting Burundi, DR Congo, Tanzania and Zambia in addressing their shared lake basin and building institutional commitments for joint multi-country collaboration (Figure 2). A project coordinating unit was established to facilitate each country participating in activities singly as well as jointly. High level officials from each nation participated in a Steering Committee responsible for the project. Various programmes were established with the objective of helping the riparian countries produce an effective and sustainable system for managing and conserving the transboundary lake. By involving local communities in its design, the programmes embrace the dual needs of development and conservation so that livelihoods of the people (sustainable use of the biodiversity) could be maintained into the future. The programmes varied from biodiversity to fisheries, impacts of sedimentation and catchment degradation, pollution, socio-economic issues, education and development of a joint geographic information system (GIS).

At an early stage, a project coordinating unit was established in Bujumbura, Burundi. The political unrest in the DR Congo and Burundi, however, necessitated the move of the coordinating unit to Tanzania. This move demonstrated the flexible nature of project management reacting to changing circumstances that was one of the keys to the

project's success. A mid-term evaluation commissioned by UNDP was equally important in redirecting the project.

The project planning called for production of a strategic plan for the lake. Following adoption of the GEF Operational Strategy by the GEF Council in 1995, UNDP worked with the project to modify its programme of work to become more consistent with the international waters portion of the Operational Strategy. The project adopted the approach of joint fact-finding in compiling information so all countries could review it and update it through GIS technology. The assessment resulted in a TDA that sets priorities for two or three top priority shared water issues. Pollution discharges in Bujumbura, Burundi, and Kigoma, Tanzania, were cited as hotspots for abatement activities. Excessive sediment loading from certain river basins, mostly in Burundi and DR Congo, and scattered elsewhere, was determined to be a priority for accelerated attention. Similarly, the over-fishing issue was identified as important because of the large commercial fishery, its economic importance to certain nations, and the transboundary nature of the stock and pattern of landings and markets.

The programme also adopted the formulation of a SAP, which is not a plan but a series of activities to be implemented not only jointly but also by individual countries to address the priority issues. Various assessments conducted under the programmes built the capacity of country officials to sample and assess environmental status in the areas of biodiversity, pollution and sedimentation.

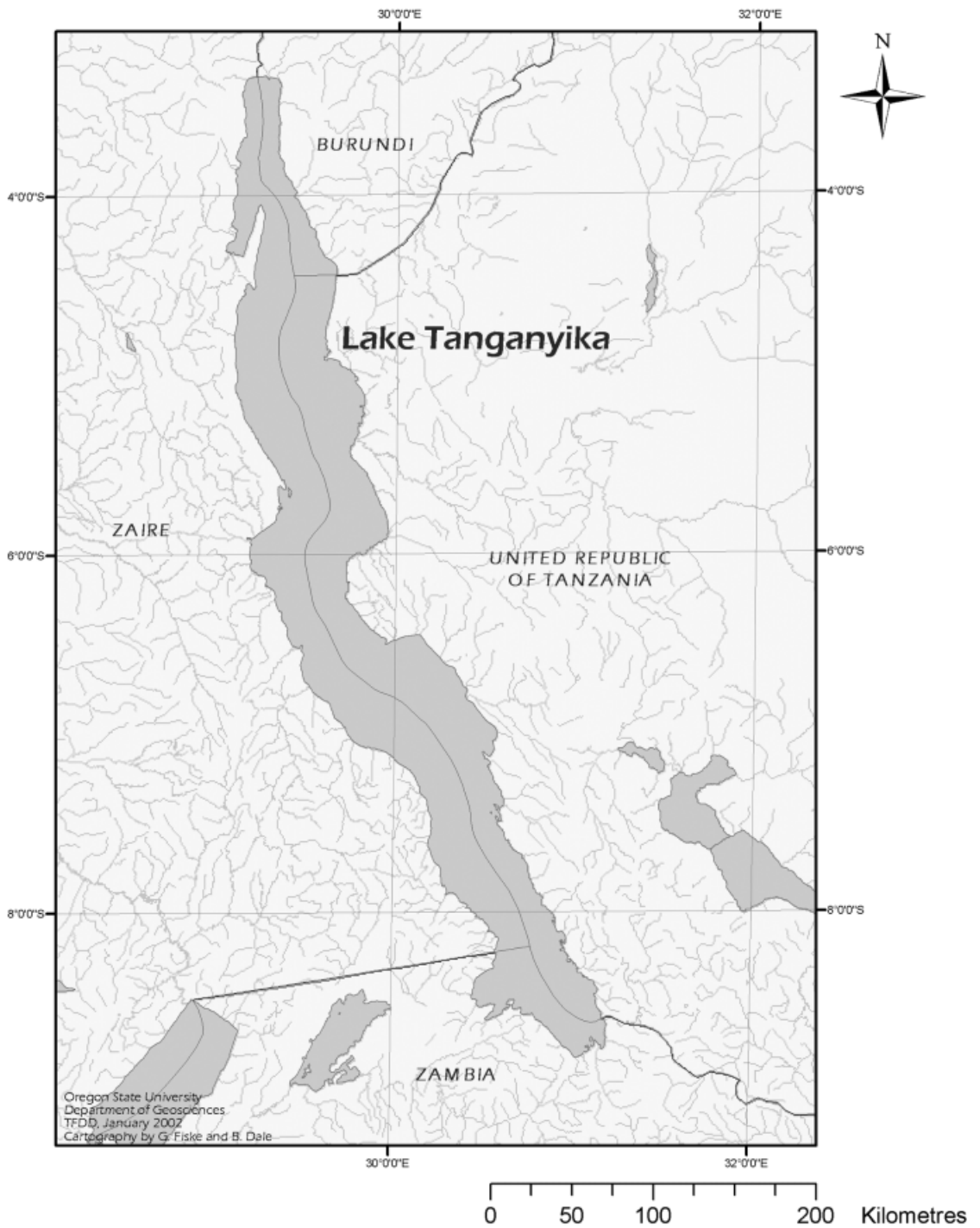


Figure 2 Lake Tanganyika and its international setting

One of the important lessons to be drawn from the Lake Tanganyika project is the importance of transparency. Many of the publications are available on the project web site (<http://www.ltbp.org>). The website is essential, since the project has inter-country linkages, linkages with UNDP, GEF and coaches from international organizations. A firewall for internal use helped in the exchange of information in this remote area in preliminary form and to allow the countries to discuss shared issues among themselves. For those without Internet access, CD-ROMs were produced every three months, and with the public portion of the website the project promoted transparency towards NGOs, government officials and funding organizations.

Of additional significance is that since the end of 1999, the Lake Tanganyika region governments were discussing the fourth draft of an international treaty (entitled, 'The Convention on the Sustainable Management of Lake Tanganyika') to affirm their political support for the restoration and protection of the Lake Tanganyika ecosystem. The draft convention would establish a Lake Tanganyika Authority consisting of a joint Management Committee and a Secretariat to assist the nations in operationalizing sustainable management of the lake, in conserving its biological resources and in reversing degradation of the catchment area draining to the lake. Various protocols and annexes would specify progressively more stringent country commitments as implementation proceeds. Despite unrest in DR Congo and Burundi, important progress has been made in understanding the technical issues of a transboundary nature, identifying hotspots for concerted action, building a joint understanding and shared vision for their lake basin, harnessing the scientific organizations and local communities, and in setting the stage for building political commitment at the top level for joint management of the resource.

Aral Sea basin

The project deals with the world's most dramatic case of environmental collapse and land degradation: the progressive drying up of the Aral Sea, the extinction of most forms of its aquatic life, and the contamination of huge land areas with salts and toxic substances (Glantz 1998; Glazovsky 1995). This environmental tragedy was brought about in a relatively short period (ca 30 years) by excessive irrigation water abstractions (up to 90%) from the two rivers which feed the Aral, with an estimated US\$300 million in lost crop production each year resulting from wasteful irrigation, waterlogging of soils and subsequent salinization. Furthermore, the

environmental disaster contributes to the conditions that breed discontent and could eventually lead to terrorism in the region (Uitto 2002b).

The objective of the GEF project is to address the root causes of the overuse and degradation of the international waters of the basin by assisting the Central Asian countries in implementing a mutually agreed SAP (Figure 3). This effort is intended to stimulate and achieve substantive and concrete progress towards the four objectives of the Aral Sea Basin Programme (ASBP):

- (a) stabilizing the environment;
- (b) rehabilitating the disaster zone around the Sea;
- (c) improving the management of international waters; and
- (d) building the capacity of the regional institutions.

In particular, the GEF project is focused on objectives (a) and (c), with the target of 'effectively reducing water consumption in the productive sectors, mainly irrigation, of at least 15% by the end of the project. The project has six components:

- Water and Salt Management (lead component), will prepare for ASBP the common policy, strategy and action programmes (30% of total cost);
- Public Awareness, dealing with education in water conservation (15% of total cost);
- Dam and Reservoir Management, to improve dam safety, and prepare investment plans (12% of total cost);
- Transboundary Water Monitoring, to create the basic capacity to monitor water flows and quality at national borders (16% of total cost);
- Wetlands Restoration, to rehabilitate a biodiversity-rich wetland area near the Amu Darya delta, while increasing local income (18% of total cost);
- Project Management Support, to enable EC-IFAS to implement the project (9% of total cost).

With the progressive decay of the irrigation infrastructure, which was accelerated by the break-up of the Soviet Union, the system, which was conceived without consideration of the boundaries and different water needs of the five now separate countries, requires costly maintenance and joint multi-country management. The lack of funds for maintenance, and the growing consciousness of national sovereignty among the basin's riparian states, have so far hindered all comprehensive attempts to rehabilitate the irrigation system even partially. Recent prolonged drought has exacerbated relations on water issues among countries, and created conflicts between upstream hydro-power exporting countries (Tajikistan and Kyrgyzstan) and downstream irrigation-dependent nations.



Figure 3 Aral Sea basin

Against this scenario of political, social and economic complexity, all of the efforts of the donor community have achieved little in their support to improve basin management, including inter-state institutional arrangements. The short-term focus is now on preventing the further collapse of the irrigation system, while efforts to support agreement on a joint vision and commitment for water sharing among riparians and the establishment of multi-sectoral and multi-country management structures are longer-term goals. The rehabilitation of the Aral Sea deltas and wetland ecosystems, which only a few decades ago supported the livelihood of large healthy populations and unique biodiversity, does not seem to be a political priority. Furthermore, land degradation is spreading to the irrigated lands inhabited by the majority of the basin's population.

Priorities have changed and countries have lost some of their interest in the actual situation in the Aral Sea and surrounding areas, while there has been mounting concern on the management of the salt mobilized by drainage waters, and on the maintenance and sustainability of the irrigation system itself. The focus had moved from the 'disaster area' to the irrigated lands, where a new, even more threatening disaster was looming. This changed focus of the countries is reflected in the Project Document which was finally presented to the GEF Council. The document, while giving assurances that the project's basic thrust remained as originally planned, pointed to a series of changes which, seen *a posteriori*, resulted instead in a major re-direction of the project's objectives and expected outcomes.

The SAP remained in draft form and became a general conceptual document, not stating any

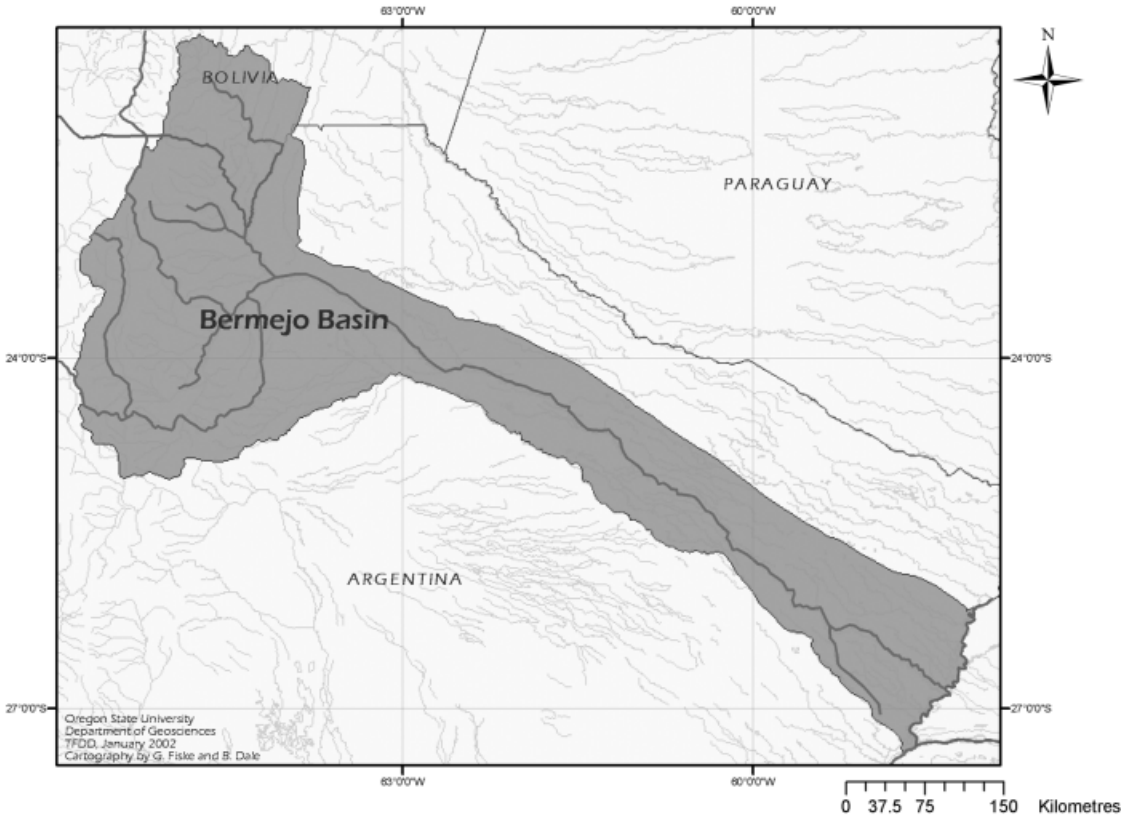


Figure 4 Bermejo River basin

specific commitment and/or action, so the shared vision and political commitment to action never materialized. As a result, the project emphasis has shifted from environment to sustainable irrigation. However, the Project Document does maintain as the major objective the 15% reduction in water abstractions from the two rivers within the life of the project, to be achieved through multi-country management and increased public awareness, particularly among farmers. In this complex situation, the GEF project represents the only remaining major international effort aimed at facilitating agreements on multi-country action on water sharing and irrigation management in the Aral Sea basin as a whole. While the GEF Implementing Agency, the World Bank, is closely monitoring project implementation, achievement of project environmental objectives remains in question.

As later developments have shown, the project's implementation suffered from the weaknesses of complex multi-country institutional frameworks, and was unable to confront growing conflicts and technical/economic problems. During the course of

its review mission in December 2000, the World Bank correctly identified the lack of effectiveness of the 'processes' that should have brought about country ownership, commitment to joint action and informed consensus on priorities for action, as the major cause for the so far overall unsatisfactory implementation of the project.

Río Bermejo

The Bermejo River basin of Bolivia and Argentina originates in the Andes and flows through the Chaco region to the Paraguay River (Figure 4). It is a major basin, covering an area the combined size of Hungary and Bulgaria. Excessive levels of sediment, important transboundary biodiversity and the existence of a bi-national commission for development of the basin made the area attractive for the GEF international waters project. An initial two-year project with strategic multi-country work (TDA/SAP) coupled with demonstration activities in basin management and land degradation control was implemented by UNEP (OAS 2000). One of the

objectives was the involvement of stakeholder groups in the basin for determining their sustainable development future. A follow-on project is underway to implement the priority measures identified by the SAP along with expected baseline activities funded by others. Of particular note is that the project was able to evoke considerable involvement and excitement from NGOs and sub-national levels of government, as well as the bi-national commission. This participation of local stakeholders in the identification and planning of both demonstration activities as well as necessary multi-country strategic work (TDA and SAP) is important for commitment to implementation at later stages with or without GEF assistance.

Another observation has been the use of demonstration activities to catch the attention of stakeholders up-front and to try pilot interventions to determine whether they may be scaled up in the implementation phase. This made the basin's land and water management problems clear to the wider public, including small farmers, whose utilizing of poor land management practices initially created many of the transboundary sedimentation problems. These demonstrations have shown that future implementation could be less risky and that corrective actions for transboundary purposes that depend on the cumulative impact of many local actions may well be successful.

The bi-national commission and its subsidiary country agencies in Argentina and Bolivia undertaking the work ensured that the project was country driven. Good collaboration occurred between the two nations in both harnessing public interest with on-site demonstrations as well as participation activities of a transboundary strategic nature. Originally, a series of 16 dams were proposed for hydropower production in the basin. This was quite controversial, especially among NGOs. Through public participation in the project, the bi-national commission that was originally created to develop hydropower transformed itself into a force for considering sustainable development options. While three dams will still be pursued, a focus on the transboundary environment, on strategic processes for participation and practical measures consistent with sustainable development helped overcome initial transboundary concerns and NGO opposition.

Early lessons from GEF projects

The multi-country project arrangements review (Ollila *et al.* 2000) and a subsequent evaluation of the GEF international waters programme carried out in 2001 (Bewers and Uitto 2001) found evidence that the use of the initial strategic projects to

build multi-country confidence in working together, to remove barriers to joint fact-finding and to build capacity among different ministries within each nation to address these transboundary issues in the different economic sectors helped to facilitate political support. They were useful to focus the countries on one or two key issues rather than a diffuse campaign on environmental improvement that usually achieves nothing. The initial scientific and technical assessment in the processes used to produce the TDA is needed to identify and quantify the environmental issues and problems and to identify their immediate, intermediate and fundamental causes. The process can also provide an instrument for the civil society to comment and to start the participation.

The case studies examined adequately demonstrate the utility of the TDA process as an initial instrument for allowing regional groupings of nations to approach the resolution of problems in international waters areas in a pragmatic and coherent manner without the loss of sovereignty. Through this process, scientific, technical, social and political considerations are all brought to bear on the identification of priorities for the adoption of harmonized and coherent multilateral action using the transboundary water environment as a first, easy issue to address confidence building. Attention is thereby focused on issues of substance conceived from comprehensive, factual perspectives rather than matters of perception. Grappling with the priority issues at early stages of the development of a strategic programme offers greater long-term benefits in ensuring that multilateral action is focused on issues of greatest importance that are likely to offer the largest net benefits (Bewers and Uitto 2001). In addition, both the review and the evaluation found that use of local demonstration projects during the initial strategic phases helps to overcome public concerns and to engage communities in participative activities. It is important that not only foreign ministries are involved, but other ministries, different sub-national levels of government, and citizen groups are also involved so that they can work together.

Perhaps the best illustration that such processes are useful steps in building multinational confidence comes from the preparation of the GEF Nile Basin project, which is part of the larger effort undertaken by the ten Nile countries known as the Nile Basin Initiative (<http://www.worldbank.org/afr/nilebasin/>). The Nile has been a problem historically and today the Nile basin and its people are at a crossroads (Mageed 1994). With assistance of the UNDP and the World Bank during July 2001, the ten Nile basin countries cooperated in launching the International Consortium for Cooperation on

the Nile in Geneva and received pledges from the donor community for an initial US\$140 million for the Shared Vision Programme of their Nile Basin Initiative, with an anticipated US\$3 billion in additional investments for sustainable development.

GEF has had a presence with the Nile countries since 1995 in their multi-country deliberations. GEF played a significant role at the start of the present political initiative in 1999 by providing preparation funds through UNDP and the World Bank to the ten nations for the formulation of a GEF international waters project that would underpin the initiative from a transboundary environment perspective. As part of the project preparation, the countries produced a transboundary environmental analysis for confidence building and priority setting (Nile Basin Initiative 2001). This analysis was produced through a participatory process and included in-country consultations, national reports and in-country inter-ministerial coordination. The transboundary environmental analysis was approved by the Nile Council of Ministers in March 2001, marking the first time in history such a substantive document has received approval of all Nile riparian countries. This catalytic process proved to be a turning point in the Nile Basin Initiative in expanding the dialogue on water in the basin from the water ministries to other ministries in each country and interest groups, such as NGOs, that have a role to play in sustainable development. It was so successful that other parts of the programme followed similar processes as piloted through the GEF. The transboundary priorities serve as the basis for the development of the GEF project that underpins and complements each of the elements of their Shared Vision Programmes.

Conclusions

Many lessons have been learned in the initial decade of GEF projects addressing transboundary water issues. International waters projects involving numerous countries that share a waterbody or basin are necessarily complex in nature, with a wide variety of social, political, economic, cultural and physiographic conditions that must be taken into consideration, depending on the nature of the priority transboundary water issue to be addressed. Achieving a shared vision and commitment among riparian countries can be facilitated by initial strategic projects that can break down the barriers among countries and enable them to focus jointly on priority issues. This allows complex situations to be broken down into manageable priorities. The processes of joint fact finding and sharing of information in producing a transboundary diagnostic analysis set the stage for the countries to produce a strategic action programme of country-specific

and regional actions needed to address the transboundary priorities.

The TDA/SAP process may be usefully carried out as part of project preparation to build institutional capacity and to set priorities. For more complex situations, the processes may be necessary as initial activities of full projects that may accompany on-the-ground demonstration activities related to the transboundary priority. While there has been concern about the length of the process (from 1.5 to 3–4 years in complex cases), experiences from Europe and North America have shown that equivalent processes have taken from 15 to 30 years in the past for some shared waterbodies to agree on priorities and gain firm commitments to action. Consequently, through GEF assistance in the international waters focal area, countries may be greatly accelerating the processes and shortening the time necessary for establishing political commitments to restore and protect transboundary water ecosystems. While these time-consuming analyses and priority-setting processes are ongoing, it is useful to complement the strategic work with on-the-ground demonstrations that help create commitment to the processes at national and local levels. These demonstrations also help underpin the application of the ecosystem approach to practical situations.

Political commitment at the highest level is necessary to ensure smooth operation of multi-country institutions and on-the-ground implementation of the actions identified in strategic projects. Where no political commitment other than an agreement to proceed on a project was present, as in the case of the Aral Sea, commitments for policy, institutional and/or legal reforms and investments have been slow to emerge. The presence of a regional agreement or convention with progressively more specific commitments is highly beneficial. The involvement of relevant existing organizations has also clearly improved the commitment of stakeholders.

Involving multiple levels of institutions is essential for projects addressing the environmental problems facing transboundary waterbodies and basins. A three-level strategy from regional to national and from national to local has broad applicability in multi-country projects. A regional agreement or convention may facilitate countries harmonizing their legislation. At the national level, country-specific inter-ministerial committees are key to ensuring coordination and desired implementation. At the subnational level, local commitment can be strengthened through changed incentive structures, national empowerment and enforcement. Information dissemination and public awareness-building are essential in this process.

Multi-country development of policy reforms requires mutual trust, which often can only be

created over a long timespan. A relatively powerful regional coordination unit, perhaps backed by a convention, has been helpful in supporting the process of political and legislative harmonization. Monitoring and evaluation plays a central role in managing complex multi-country projects and can ensure transparency regarding project progress, actions by all participating countries and results. The fact that a multi-country institution can be built or an existing one strengthened to facilitate continued country-based action for certain priority transboundary water issues after GEF-supported interventions are completed is a very important initial outcome of typical international waters projects.

All relevant stakeholders in the countries – including the public and private sectors, the scientific community and civil society – need to be involved in a project addressing priority issues. The inclusion of NGOs has been useful for involving local stakeholders and they can also play an important role in ensuring transparency and political support. The scientific community should ensure that sound science is used to improve management and decisionmaking. Harnessing the scientific community as part of identifying the linkages in a diagnostic analysis of the components of transboundary ecosystems is a necessary step toward incorporating an ecosystem approach into a strategic action programme.

The ecosystem-based approaches strongly suggest that entire basins be considered if important transboundary linkages exist and that all the linked problems, such as habitat loss, pollution, over-fishing and water diversion, be addressed if they constitute priority problems. It does no good to just treat the symptoms when the root causes remain unaddressed or other considerations still drive ecosystem degradation. Freshwater and coastal/marine biodiversity is among the most threatened on earth, and multi-country joint action is needed to restore and protect these transboundary ecosystems. These processes promoting multi-country collaboration standing on a solid scientific footing have proven to be effective in reducing the tensions between competing uses of international waters. They can help move the issues concerning transboundary water resources from conflict to cooperation.

References

- Bewers J M and Uitto J I** 2001 *International waters program study* Evaluation Report #1-01 Global Environment Facility, Washington DC
- Biswas A K** 2000 Water for urban areas of the developing world in the twenty-first century in **Uitto J I and Biswas A K** eds *Water for urban areas: challenges and perspectives* United Nations University Press, Tokyo 1–23
- Duda A M** 1994 Achieving pollution prevention goals for transboundary waters through international joint commission processes *Water Science and Technology* 30 223–31
- Duda A M and El-Ashry M T** 2000 Addressing the global water and environment crises through integrated approaches to the management of land, water and ecological resources *Water International* 25 115–26
- Duda A M and La Roche D** 1997 Joint institutional arrangements for addressing transboundary water resources issues – lessons for the GEF *Natural Resources Forum* 21 127–37
- GEF** 1996 *Operational strategy* Global Environment Facility, Washington DC
- Glantz M H** 1998 Creeping environmental problems in the Aral Sea basin in **Kobori I and Glantz M H** eds *Central Eurasian water crisis: Caspian, Aral, and Dead Seas* United Nations University Press, Tokyo 25–52
- Glazovsky N F** 1995 The Aral Sea basin in **Kasperson J X, Kasperson R E and Turner B L, II** eds *Regions at risk: comparisons of threatened environments* United Nations University Press, Tokyo 92–139
- Homer-Dixon T** 1999 The myth of global water wars *Forum International* Committee of the Red Cross, Geneva 10–13
- IPCC** 2001 *The regional impacts of climate change: an assessment of vulnerability* Intergovernmental Panel on Climate Change, Geneva
- Mageed Y A** 1994 The Nile basin: lessons from the past in **Biswas A K** ed *International waters of the Middle East: from Euphrates-Tigris to Nile* Oxford University Press, Bombay 156–84
- Nile Basin Initiative** 2001 *Transboundary environmental analysis* Shared Vision Program, Nile Basin Initiative Secretariat (<http://www.nilebasin.org>) Entebbe, Uganda
- OAS** 2000 *Transboundary diagnostic analysis of the binational basin of the Bermejo river* Programa estrategico de accion para la cuenca del Río Bermejo, Organisation of American States, Buenos Aires
- Olilla P, Uitto J I, Crepin C and Duda A M** 2000 *Multi-country project arrangements: report of a thematic review* Monitoring and Evaluation Working Paper 3 Global Environment Facility, Washington DC
- Rangeley R, Thiam B M, Andersen R A and Lyle C A** 1994 *International river basin organizations in sub-Saharan Africa* Technical paper no. 250 World Bank, Washington DC
- Renner M** 1996 *Fighting for survival: environmental decline, social conflict, and the new age of insecurity* W W Norton, New York
- Sjöberg H** 1999 *Restructuring the Global Environment Facility* Working Paper 13, Global Environment Facility, Washington DC
- Uitto J I** 2000 Population, food and water in the 21st century in **Rose J** ed *Population problems: topical issues* Gordon and Breach, Amsterdam 93–110
- Uitto J I** 2001 Global freshwater resources in **Palo M, Uusivuori J and Mery G** eds *World forests, markets and policies* Kluwer, Amsterdam 65–76
- Uitto J I** 2002a Multi-country co-operation for sustainable development of international lake basins: lessons from the

- Global Environment Facility in **Jansky L, Nakayama M and Uitto J I** eds *Lakes and reservoirs as international water systems* Towards a World Lake Vision United Nations University, Tokyo 79–93
- Uitto J I** 2002b Environmental disaster feeds terrorism *The Japan Times* 30 March
- UN** 1997a *World demographic trends* Report of the Secretary-General E/CN.9/1997/9 Commission on Population and Development, thirtieth session 24–28 February 1997 United Nations Economic and Social Council, New York
- UN** 1997b *Comprehensive assessment of the freshwater resources of the world* United Nations, New York
- Wolf A T, Natharius J A, Danielson J J, Ward B S and Pender J K** 1999 International river basins of the world *International Journal of Water Resources Development* 15 387–427
- World Commission on Dams** 2000 *Dams and development – a new framework for decision-making* Earthscan Publications, London
- World Water Commission** 2000 *A water secure world – vision for water, life, and the environment* Thanet Press, London