

# Management of Transboundary Waters: An Overview

Asit K. Biswas

## 1.1 Introduction

Historically, global water demands have increased steadily with population growth and the subsequent rise of various types of human activities. With a steadily growing world population, and mankind's eternal quest for higher and higher standards of living, there is no doubt that the demands on our natural resources, both non-renewable and renewable, will continue to augment well into the foreseeable future. Water, a renewable resource, will be no exception to this general trend.

Even when the global population stabilizes, which is expected to be around the year 2050, the demands for certain resources such as water may continue to increase because of higher *per capita* demands from more and more people in the developing world, who will seek to attain better standards of living, and also as a result of changing lifestyles, both in developed and developing countries. These trends are now clearly visible in countries such as India, where already more than 100 million people have reached a middle-class standard of living. This rapidly emerging class is steadily flexing its new-found political and economic muscles and, in the area of water, unlike earlier generations, they are not likely to remain satisfied with the *status quo* of a few hours of intermittent supply of dubious quality every day. Changing lifestyles are also likely to increase their water consumptions. Under these conditions, the availability of adequate quantity and appropriate quality of water to an increasingly urban population of the developing world is likely to be an important political and social consideration in the coming decades for most such countries.

Three other factors should also be considered to meet the water requirements of the future in a timely manner. These are water requirements for agricultural production and energy generation, and increasing water contamination due to accelerating human activities, especially in developing countries. Efficient irrigated agriculture is essential for ensuring reliable food production in the 21<sup>st</sup> century, to meet the demand from a larger and increasingly affluent population. At present nearly 55% of all rice and wheat produced in the world comes from irrigated areas and some 2.4 billion people currently depend on irrigated agriculture for food, income and employment. Current estimates indicate that 80% of the additional food supplies required to feed the future world population will depend on the availability of a reliable water supply which can only be provided by irrigation. Reliable availability of adequate quantity and quality of water for increasing agricultural

production will continue to be an important factor for the entire humankind well into the 21<sup>st</sup> century.

While water requirements for increasing global agricultural production have received considerable attention in recent years, water needs for energy production have been basically neglected by the water and development professionals. High development and economic growth rates cannot be achieved, especially in the developing world without the availability of adequate energy resources. No large-scale electricity generation is possible without large quantities of water. In addition to hydropower generation, construction and operation of new thermal and nuclear plants would require significant additional quantities of cooling water, a fact that has basically escaped both water and energy planners to date. No developing country has formulated, let alone implemented, a water policy which explicitly considers increasing electricity requirements of the country and its implications to the water sector in terms of resource availability and use. Water and energy have a symbiotic relationship, one depends on the other for its production. Thus, water requirements for the energy sector will require priority attention in the future.

A good example of the implications of massive increases in electricity generation on national and transboundary water resources is the Asian developing countries. These countries had a total generating capacity of 250,000 MW in 1990, nearly 70% of which was thermally generated (mainly coal), with the balance of 30% being accounted for mostly by hydropower. Another 240,000 MW was needed by the year 2000 to fulfil their own development plans. This almost doubling of electricity requirements within a very short period of only one decade means that the water needs of a rapidly expanding energy sector can no longer be ignored, especially as similar growth rates are expected to continue, and may even accelerate, during the early part of the 21<sup>st</sup> century (Biswas and Hashimoto 1996). Similarly, in countries as diverse as Brazil, China, India, Thailand and Turkey, electricity demands are now often growing by 6–10% annually. It should also be noted that for England and Wales, some 36% of all water abstracted at present is accounted for by the energy-generation industry alone. The corresponding figure for France is much higher, as is for Mexico. Thus, the future global water requirements for the energy sector cannot longer be ignored. It must be factored in for water planning and management processes. The demand for water for the energy sector will also be reflected in terms of impacts on the transboundary water bodies of Asia.

Another important issue is increasing water contamination, especially in the developing world. Many point sources of water must now receive expensive treatment before they could be used beneficially. In future, non-point sources will have to be considered to control water pollution. While much rhetoric can now be noted in terms of water pollution control and ecosystems conservation, in reality appropriate remedial actions on the ground are often conspicuous by their absence. Inadequate treatment of domestic and industrial wastewater (for example, in Latin America as a whole, only about 11% of the total wastewater produced is now properly treated and disposed in an environmentally-safe manner), and continuing neglect of properly controlling non-point sources of pollution, mean that water

quality management urgently needs more than the lip-service it is receiving at present. This situation is affecting both national and transboundary waters.

The above issues, as well as other associated factors, like climate change, mean that efficient water management in the coming decades will face a challenge, the like of which no previous generation has had to confront earlier. In spite of the gravity of the situation, unfortunately we currently do not have even reasonably reliable assessments of the global situation in terms of water quantity and quality and associated factors. While these are continuing problems with exclusively national water bodies, the problems are generally even more serious and complex for many transboundary water bodies because of lack of trust and absence of meaningful cooperation between the appropriate co-basin countries. In Asia, Africa and Latin America, successful management of transboundary water bodies will experience continuing and conflicting pressures in terms of quantity and quality for several decades to come.

## 1.2 Importance of Transboundary Waters

The foregoing factors and other related issues, when considered together, indicate that water requirements in the arid and semi-arid areas will continue to increase steadily in the foreseeable future for a variety of reasons (Biswas 1994, 1997), among which are the following:

- All easily available and exclusively national sources of water have already been developed or are in the process of development. This means that the real costs of new projects per cubic metre of water supplied will continue to increase in the future, often very substantially. An analysis of domestic water supply projects supported by the World Bank indicates that the cost per cubic metre of water for the next generation of projects is often 2–3 times higher than from the present generation.
- Water needs for ecosystem and habitat preservation will increasingly be considered to be a ‘legitimate’ use in the future, most likely within a decade. This will put additional pressure on water available for existing ‘traditional’ uses and may contribute to some conflicts in terms of water allocation between all the users.
- For environmental and social reasons, the next generation of water projects will take significantly longer timeframe to develop than currently anticipated by the planners, which may further intensify and complicate the anticipated water shortages in the foreseeable future.
- Water planning and management practices are likely to improve only incrementally during the near to medium terms. Based on current trends, radical changes in such practices needed to resolve the water crisis appear to be somewhat unlikely within the next decade.

All these factors will most probably contribute to tremendous socio-political pressure to develop new sources of water. Since new sources of water that are ex-

clusively national which could be efficiently developed techno-economically are generally no longer available in most developing countries, there would be tremendous pressure in this region to develop transboundary water bodies, that is those rivers, lakes and aquifers that are shared by two or more countries. This is because transboundary bodies are often the only sources of water left which could be developed economically. These water bodies were not considered for development in the past because of the absence of any agreements between the co-basin countries on their allocation and utilization. The political risks and economic complexities were considered to be too high for their unilateral development by only one country, without an explicit agreement with its co-basin countries. However, as water shortages in individual nations become more and more severe, and, if and when they create serious internal political and social tensions and unrest, some countries may decide to develop such resources, irrespective of potential external political risks even though it may imply a 'beggar thy neighbour' attitude.

This trend can be discerned by considering the following aspects. During the past two decades, there have been an increasing number of examples where countries have built dams and barrages on the main stems of transboundary rivers (some times even very close to the borders between the countries) and/or on major tributaries, which could affect the flow regime in the downstream countries. Furthermore, the number of studies that have already been completed, or are under preparation, on the development of the major tributaries of several transboundary rivers, especially when they are under exclusive national jurisdiction, is increasing all the time. All these developments on major tributaries would clearly have perceptible impacts on the flow regime of the main transboundary rivers. A good example of this development can be noted from the Mekong River experience. On April 5, 1995, the plenipotentiaries from Cambodia, Lao PDR, Thailand and Vietnam signed an agreement on cooperation for the sustainable development of the Lower Mekong River Basin at Chiang Rai, Thailand. Following the signing ceremony, the VIPs embarked on a boat tour of the Mekong River. The boat, however, got stuck in the river because, unknown to the participants, China was filling up the reservoir of a new dam on a major tributary of the Mekong upstream in the Chinese territory. China is not a member of the reconstituted Mekong River Commission, though it has an observer status. Currently several dams are under construction and/or are under active planning consideration upstream in exclusively Chinese territory, which is the most upstream country in the Mekong River system. Such developments in the exclusively national tributaries of the Asian transboundary rivers may become a norm, rather than an exception, in the future.

International development funding agencies, both multilateral and bilateral, have generally in the past declined to provide credits for the development of transboundary waters, until and unless the countries concerned have signed a mutually acceptable agreement. Without external financial assistance, developing countries have often been unable to construct capital-intensive water development projects on transboundary rivers, even if they had wished to do so unilaterally. An analysis of the latest trends indicates that this situation appears to be changing in Asia for the following reasons:

- Many of the countries concerned are now capable of raising the necessary investment funds from internal national sources (for example, in India, nearly 90% of the required investment funds are now internally generated: corresponding figure for Bangladesh is nearly 50%).
- Private sector funds, both international and national, can be harnessed for such developments, especially for hydropower projects (Birecik Dam on the Euphrates River was completed with private sector funding).
- Multilateral funding agencies appear to have been taking a somewhat more liberal approach recently to support such development activities. For example, while they are still continuing to decline to finance construction of the main structures like the dams and hydropower plants, they have begun to support associated activities like agricultural development, even when they may use water from the project (an example is the GAP Project on the Euphrates River in Turkey (Biswas et al. 2004), where the funding agencies declined to support the construction of the Ataturk Dam, but they are providing funds for the related agricultural development activities).
- In many cases international financing supports only a small part of the total project cost. Absence of international funds thus could mean only an extension of the time needed for completing the construction of the project. Absence of external funding may not necessarily stop the project, as may have been the case in the past.

Herein will lie one of the principal challenges to the water profession in the 21<sup>st</sup> century: how to develop and manage the various transboundary water sources sustainably and efficiently in full agreement and cooperation between the appropriate co-basin countries so that they result in a 'win-win' situation for all the parties concerned. The development considerations would no longer be confined to the techno-economical and environmental factors alone, as is generally the case at present for the exclusively national water sources. Other factors would have to be considered. These would include binational or multinational political considerations, political and economic power of the country in which the water development would take place in relation to the other co-basin countries, importance of maintaining good relations between the countries concerned, and the general international and media interest in the project. These and other similar associated issues are likely to increase the complexity of the transboundary water management processes in the future, often by several orders of magnitudes. Hydropolitics, both nationally and internationally, is thus likely to become an increasingly important global issue in the coming years for the management of transboundary river and lake basins and aquifers (Biswas et al. 1999).

### 1.3 Magnitude and Distribution of Transboundary Waters

In the context of the present book, the various issues associated with transboundary waters will be discussed only in terms of freshwater. Coastal and ocean waters are not considered, since these sources need to be analysed and discussed in a different context, and within wholly different planning and management frameworks.

In the area of freshwater, three types of water sources need to be considered. These are rivers, lakes and groundwaters, even though often these sources are interconnected. While we now have considerable experience with the management of transboundary rivers, and to a lesser extent transboundary lakes, similar knowledge on groundwater-related issues is mostly conspicuous by its absence. While the legal regime for managing transboundary surface water bodies has progressively evolved over the past four decades, similar progress has not been made on management of transboundary aquifers.

The global magnitude and the distribution of the problem of transboundary rivers and lakes are reasonably known at present, though much work is still needed on several methodological aspects of the problems, before these could be accurately defined. The literature is replete with unscientific and hypothetical “facts and figures” even for transboundary surface water bodies. The information base is basically non-existent for most transboundary aquifers, and whatever information that is currently available, its reliability is mostly unknown.

During the 1980–2000 period, it was assumed that there were 214 transboundary river and lake basins in the world. This number originated from a report that was completed in 1976, but published in 1978, by the now defunct Centre for Natural Resources, Energy and Transport (CNRET) of the Department of Economic and Social Affairs of the United Nations. This number itself was an upward revision of an earlier (1958) estimate of 166 transboundary river and lake basins by the same institution, CNRET.

While the CNRET analyses can be considered to be a very good beginning, its shortcomings are clearly evident more than two decades later. The study defined a river basin as an ‘area within which waters of natural origin (rain, groundwater flow, melting of snow and ice) feed a given river’. It considered only those transboundary river basins which were ‘separate’ (that is, not tributary basins), and were connected ‘directly with the final recipient of the water (oceans, closed island seas and lakes)’.

The study further indicated that nearly 47% of the area of the world (excluding Antarctica) falls within transboundary basins. It ranged from a high of nearly 60% of the area in Africa and South America to a low of about 40% in North and Central America. Viewed in a different fashion, the report indicated that there are 44 countries where at least 80% of the total areas are within transboundary basins. Of these 44 countries, 20 are in Africa, 7 in Asia, 13 in Europe and 4 in Latin America.

The CNRET study can be at best be considered to be a preliminary assessment of the magnitude of the problem, which incidentally was also the intention of its originators. It suffered from some serious methodological shortcomings. It was

based exclusively on maps available at the United Nations Map Library: primarily a desk study with maps, some of which were of the scale of 1: 15,000 000, or even less.

Unfortunately, the results of the CNRET study have been repeated often in the past without any technical scrutiny. Not surprisingly, these figures were accepted as facts for nearly 25 years. This uncritical acceptance of the written words is all the more difficult to justify when one considers the fact that during the intervening period many countries such as the Soviet Union, Czechoslovakia, and Yugoslavia split up into new countries, thus creating new transboundary river and lake basins.

In retrospect, the uncritical acceptance of the CNRET study of transboundary river and lake basins has had at least one unfortunate side-effect (CNRET 1978). Since the number was an underestimate, it gave the erroneous impression that the overall magnitude and extent of the problem was much less serious than what it was, and was likely to become in the foreseeable future. This knowledge-base has improved further by the work of Wolf et al. (1999). This work was carried out with the financial and intellectual support of the Third World Centre for Water Management. The estimates of CNRET (1978) and Wolf et al. (1999) are shown in Table 1.1.

**Table 1.1.** Number of transboundary river basins

Continents	Number of basins	
	CNRET	Wolf, et al.
Africa	57	60
Asia	40	53
Europe	48	71
North and Central America	33	39
South America	36	38
Total	214	261

Source: CNRET (1978) and Wolf et al. (1999)

This underestimation has been further compounded by the fact that the international organizations like the various United Nations Agencies, World Bank and the Regional Development Banks, have for the most part shied away from the issue of the management of transboundary basins, except for consideration of non-controversial and non-threatening issues like expert group meetings and confidence-building measure. Most of these have turned out to be activities which in reality often achieved very little. Unfortunately, during the past three decades, most international and bilateral development organizations have progressively become more and more risk-averse and politically correct. Even for the United Nations Water Conference held in Mar del Plata, Argentina, in March 1977, the issue of transboundary rivers was deliberately given a lower profile. This was because of the belief that discussions on this issue could prove to be politically charged and could create political tensions between the countries, which, in turn, could affect the overall outcomes of the Conference. These factors, to a significant extent, can explain why the issue of the management of transboundary waters has not

been as high up the international political agenda during the 1975–2000 period, as it should have been because of its increasing importance and complexity.

## 1.4 Complexities of Managing with Transboundary Waters

The issue of efficient management and development of transboundary rivers and lakes has not been an easy subject to deal with at major international fora. While there are many reasons for this uneasiness, probably the two most important reasons for this in the past have been due to the issue of national sovereignty and the absence of agreement on the management of vast majority of transboundary freshwater bodies.

The first reason, that of national sovereignty, is a most important political consideration at the nation-state levels. Historically, all the nation-states have jealously guarded their sovereign powers to manage the activities within their own borders. Thus, not surprisingly, the overall discussions on the management of transboundary rivers and lakes have often been somewhat controversial because of consideration of national sovereignty issues. For example, during the United Nations Conference on the Human Environment, held in Stockholm in 1972, Brazil took a very strong stand on the discussions on the management of shared natural resources because of national sovereignty considerations. The word “shared” in the context of this Conference meant natural resources that are shared by two or more countries. A very important concern for the Brazilian Government at that time was forest-related issues. Brazil was most concerned that through the use of international resolutions at the United Nations on shared natural resources, the country may be forced to take decisions in its Amazon region, which may preempt certain future national activities in the area, irrespective of the importance of such activities in terms of its own national interest. Brazil continued to take a strong stand against such international discussions on shared natural resources during the entire 1970s and part of the following decade. Because of such pressures, the resolution on shared natural resources at Stockholm had to be watered down significantly to ensure an unanimous agreement. Thus, the Principle 21 of the Stockholm Conference finally read:

“states have... .. the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibilities to ensure that the activities within their jurisdiction or control do not cause damage to the environment of other states or of areas beyond the limits of national jurisdiction”.

During the 1970s and 1980s, because many countries strongly opposed discussions on the management of shared resources due to perceived national self-interests, the various United Nations organizations basically decided to stay away from serious considerations of management of transboundary rivers. To the extent the discussions took place, these were mostly on confidence building, mutual collaboration, information exchange, expert group meetings, general workshops, etc. Not surprisingly, in spite of considerable amount of resources being spent, there was no real progress in this area during the 1970s, 1980s and much of the 1990s.

The second reason is the perceived national self-interests of the various co-basin countries on numerous transboundary rivers and lakes on which operational treaties do not exist at present. The word “operational” in this context is worth noting, since for some treaties, like the one on the Lower Mekong, the current treaty may be a step in the right direction but it is of very limited use since it did not address the complex but important issue of water allocation between the riparian countries in any form. Thus, many countries which are currently negotiating treaties on transboundary rivers with their co-basin counterparts, or likely to do so in the foreseeable future, often feel that they would prefer to resolve the problems on the basis of bilateral or multilateral negotiations, rather than through an intermediary international or foreign institution. The countries generally prefer not to be constrained by international norms or guidelines, which may reduce their degree of manoeuvrability, and thus the final outcomes. Accordingly, they often either take a strong stand against such norms or abstain from the discussions or voting. Behind the scene, however, many countries have often let their views known to the staff members of the international organizations in no uncertain terms: they would prefer them to stay away. These organizations, in turn, have preferred to play safe and not take any risk by taking a leadership position in terms of facilitating negotiations, which may prove to be controversial and may even annoy certain countries. For the most part, the international institutions have followed what some of these countries had recommended.

## **1.5 Roles Played by International Organizations**

During the past two decades, international organizations have played a very limited role in terms of facilitating agreements on transboundary river basins. Unquestionably, the most noteworthy and successful case where an international organization played a very critical role as a catalyst and a facilitator to get the co-basin countries to agree to a treaty was for the Indus River Basin between India and Pakistan, some half century ago. Eugene Black, the then President of the World Bank, clearly and unambiguously indicated to the leaders of India and Pakistan, at the highest political levels, his own personal interest in resolving the conflict over the Indus basin amicably and speedily. He not only made the expertise and resources of the Bank available to both the countries in terms of mediation, but also kept himself fully briefed of the progress during the almost decade-long negotiation process. When there was an impasse, he was not afraid to play a critical role in person by assisting the countries to overcome it. The Bank played the role of an ‘honest broker’ properly and impartially, and its roles were perceived to be independent and constructive by both the countries. The ‘carrot’ that the Bank extended to facilitate the agreement was an irresistible offer to finance new water development projects, subject to a mutually acceptable agreement between the two countries on the sharing of the waters of the Indus River system. This proved to be a very attractive incentive for both the parties concerned. The

Indus Treaty was formally signed by India and Pakistan on 19 September 1960 (Biswas 1992).

It is interesting to note that even though the negotiations between the two countries took less than a decade, the subsequent agreement between the four provinces of Pakistan on the allocation of its share of the Indus water took an additional three and a half decades!

In retrospect, the entire negotiation between the two countries was completed within a remarkably short period, especially for such a complex treaty. The Indus Treaty is indeed a major tribute to the astute and dynamic leadership of President Black, who not only accepted the risk of potential failure but also was prepared to get involved personally and had no hesitation to put his own personal reputation and credibility, as well as the substantial resources of the Bank, on the line for its successful completion, and its subsequent implementation.

The most unfortunate aspect of the post-1960 period has been the near total absence of the type of courageous and prudent leadership that was shown by Black, either by the World Bank, for that matter, by any other international organization. In 1976, another World Bank President, Robert McNamara, did discuss the issue of the sharing of the Ganges waters between India and Pakistan, but no progress was made for many reasons, among which were the following:

- It was the technical professionals at the World Bank who were interested in the resolution of the problem, and not its main leaders. By the mid-1970s, the Ganges issue had already been highly politicized in the countries concerned. The Bank career professionals had very little, if any, access to the highest levels of political decision-making, especially in India. Without such high level access, it was simply impossible to find a solution that may have been politically acceptable to the two countries concerned.
- In contrast to the ‘honest broker’ role played by the Bank for the Indus River Treaty, the overwhelming perception in India, rightly or wrongly, was that the Bank’s own preference for a Ganges solution was closer to the one advocated by Bangladesh, compared to that of India. Not surprisingly, India distrusted that the Bank could play an impartial role in any mediating process, and thus it rejected the overture of the Bank. This distrust has basically continued up to the present.
- During the 1950s, when the Indus Water Treaty was being negotiated, the Bank’s independence and image were considered irreproachable by the developing world. It was also considered to be extremely powerful by the two newly independent countries. Some two decades later, when the Bank attempted to discuss a possible Ganges treaty, this “reverence” for the Bank had declined very considerably. Accordingly, the Bank no longer was in a position to “nudge” the countries towards a possible solution.
- Countries of the region are now much more economically developed, they have considerable technical and management expertise, and they are also more independent-minded. Thus, the Bank’s offer of any financial assistance, if a treaty on a transboundary river could be signed, was not as persuasive as it was in the 1950s.

Two other international organizations did subsequently attempt to play a role in managing transboundary rivers: the United Nations Environment Programme (UNEP) on the Zambezi River, and the United Nations Development Programme (UNDP) on the Mekong River.

First is the Zambezi basin, which covers eight countries: Angola, Botswana, Malawi, Mozambique, Namibia, Tanzania, Zambia and Zimbabwe. UNEP convened a Conference of Plenipotentiaries on the Environmental Management of the Common Zambezi River system in Harare, Zimbabwe, in May 1987. The primary objective of the Conference was to approve the draft Zambezi Action Plan (ZACPLAN), which was prepared by UNEP in close consultation with most of the countries concerned. The plenipotentiaries of the five co-basin countries (Botswana, Mozambique, Tanzania, Zambia and Zimbabwe) did sign an 'International Agreement on the Action Plan for the Environmentally Sound Management of the Common Zambezi River system' (David 1988; Nakayama 1997). While initially considered to be a success for UNEP, real progress in terms of its implementation of the Plan in over more than two decades, has been very minimal. This is in spite of the fact that, unlike the Ganges, the Zambezi is a water-surplus river. Thus, at least conceptually, it may have been simpler to facilitate such an agreement on the Zambezi where there was no conflict over water allocation, compared to the Indus basin, where, by all accounts, water has been a scarce resource.

The second is the role played by UNDP in facilitating the Agreement on the Cooperation for the Sustainable Development of the Mekong River Basin. This was signed in 1995 by the four lower co-basin countries (Thailand, Cambodia, Laos PRD and Vietnam). While it is too early to make any authoritative judgement on the impact of this agreement, it is somewhat unlikely to have much impact on the future developments of the Mekong River system. It should be noted that for nearly four decades, UNDP had played "the roles of godfather, referee, rich uncle and fund-raiser to the Mekong Committee" (Miller 1996), which had already spent hundreds of millions of dollars during its existence. The disappearance of the Interim Mekong Committee, which appeared to be a distinct possibility in 1992, would have been a serious moral and political blow to UNDP, since all these investments would have been lost and showed very limited returns. UNDP subsequently played a constructive role, which led to an agreement being signed on the Lower Mekong by Cambodia, Laos PDR, Thailand and Vietnam. However, China, the most powerful country of the region, and the most upstream country on the river, was not a signatory to this agreement. It has also declined to be a member of the new Mekong River Commission, in spite of considerable pressure from UNDP and urging from the four lower co-basin countries. This is likely to be a major constraint in the future for any basin-wide coordinated planning and development.

While the agreement on the Lower Mekong is a step in the right direction, it is unlikely to contribute significantly to the efficient management of the Mekong River Basin for at least two reasons. First, the water requirements for all uses in China are increasing rapidly, and thus it needs to develop its water resources as much as possible, and as quickly as possible. Currently several provinces of China have plans to develop the water resources of the Upper Mekong. China has stead-

fastly refused to join the earlier Interim Mekong Committee or the present Commission. In addition, China was only one of the three countries which voted in May 1997 against the resolution to establish an International Convention on the Law of the Non-Navigational Uses of International Watercourses at the United Nations. This may signify some negative implications for the future coordinated developments of the Mekong.

Second, the most difficult part of any international agreement in the developing world is the actual process of water allocation between the various co-basin countries. The Mekong Agreement does not include any specific allocation of water between the countries. It contains usual terminologies such as 'reasonable and equitable utilization', and 'prevention and cessation of harmful effects', on which even independent, objective experts may not agree, let alone countries with vested interests. In the final analysis, the Mekong Treaty is basically a framework agreement for the lower four riparian countries, primarily to consult and to cooperate. It does not address the most critical issue of under allocation between the four signatory countries. Accordingly, the potential for conflicts between the countries on this issue in the future, in spite of the existing treaty, is therefore quite high. This may come because the water requirements of the two most powerful countries on the Mekong, China and Thailand, are increasing steadily. Both of these countries are likely to further harness the waters of the tributaries of the Mekong that are in their own national jurisdictions, even though such steps may change the flow regime of the main stream.

Overall, no matter whatever criteria are used for analysis, international organizations have played a very marginal role in resolving conflicts on transboundary rivers and lakes in recent decades. Given real leaderships in the major international institutions, they could have played a significantly more effective role in this area during the past four decades. Regrettably, there are no perceptible signs that this situation is changing for the better.

## **1.6 Legal Regimes for Managing Transboundary Waters: an Analysis**

Since water does not respect political boundaries, and it is mobile, countries on a transboundary river could use its resources as it moves sequentially from upstream to downstream. When a river forms a boundary between two countries, two political units which would have simultaneous authority over a mobile resource like water, could contribute to the generation of several types of transboundary water conflicts.

Because of potential conflicts between co-basin countries on transboundary rivers and lakes, historically many nations have negotiated mutually acceptable agreements as to how such water bodies can be used. Over 3,600 treaties can be noted on transboundary water bodies between 800 AD, and 1985, the majority of which deal with navigation, which was the primary form of transportation during the earlier times. Especially after the Second World War, several treaties were ne-

gotiated on transboundary water bodies, which dealt with non-navigational uses like flood control, hydropower development, water quality management and water allocation. It should be noted that generally it has been easier to negotiate treaties on the navigable uses of rivers, since these do not require water allocation, or use considerations. Historically, it has been most difficult to get the countries to agree on the actual allocation of water quantities between the appropriate co-basins, and to a lesser extent on water quality management.

The first important study on the legal aspects of using the waters of the transboundary rivers was carried out by Prof. H. A. Smith of London. His book on *The Economic Use of International Rivers* was published in 1931. He reviewed more than 100 treaties and studied several conflicts on the use of transboundary rivers. He emphasized the doctrine of riparian rights, which entitled the lower riparian states to a share of the natural flow of a river. He also noted that some of the treaties considered the concept of equitable utilization.

In 1956, the International Law Association (ILA) published the *Dubrovnik Rules* for the planning and management of transboundary rivers. Subsequently, in 1959, Bolivia introduced a resolution in the United Nations General Assembly which requested the Secretary General to prepare a report on laws related to transboundary rivers. This resolution was passed. However, what led Bolivia to propose this resolution is unknown at present.

In 1966, ILA adopted the so-called 'Helsinki Rules' for transboundary watercourses. Thereafter, in 1970, Finland, where the Helsinki Rules were formulated, introduced a resolution in the UN General Assembly on the laws for transboundary watercourses, which suggested that the Helsinki Rules should be considered as a model.

During the ensuing discussions in the United Nations, three reservations to the Helsinki Rules surfaced. These were the following:

- The Rules were formulated by a professional organization, which did not represent nation states.
- Since nation states had not participated in the formulation of the Helsinki Rules, their adoption as a model could preclude new considerations on this complex issue.
- The Rules were based on a drainage basin approach, which could be a potential problem in terms of national sovereignty considerations.

An analysis of the ensuing discussions in the United Nations indicates that the most important reservation centred on the use of the drainage basin concept. Belgium, Brazil, China and France argued that such an approach would be a radical departure from the traditional channel-based international law. In contrast, Finland and The Netherlands felt that the drainage basin framework was the most rational and scientific approach, and thus it should be followed. Certain other countries opined that the problem of transboundary river basins was so diverse that codification may simply not be possible, or advisable.

The resolution to refer to the Helsinki Rules was lost. However, a similar resolution was passed with only one negative vote (Brazil), after the reference to the Helsinki Rules was deleted. This resolution recommended that the International

Law Commission (ILC) should “take up the study of the law of the non-navigable uses of international watercourses with a view to progressive development and codification”.

In 1974, the ILC sent out a questionnaire to all the members of the General Assembly soliciting their view on nine key questions. The responses, however, were not encouraging. By 1975, only 21 of the 147 UN members had bothered to reply. Four additional countries replied by 1978, one by 1979, four by 1980 and two by 1982. Not surprisingly, on the critical issue of the appropriateness of the drainage basin concept, the countries were sharply divided. Approximately half the countries supported the concept (Argentina, Finland and The Netherlands) and the other half were either strongly negative (Austria, Brazil and Spain) or ambivalent. Because of such sharp differences, ILC decided to begin with the formulation of general principles, and then determine the scope of the term “international watercourses” later. The scope of this term was finally addressed in 1991, when the ILC produced a draft report on the law of the non-navigational uses of international watercourses.

Considerable discussion took place during the 1991-97 period on the ILC draft. Finally, on 8 July 1997, the UN General Assembly approved the resolution on non-navigational uses of international watercourses. It is interesting to review the voting patterns on this resolution, especially in terms of existing disputes on various transboundary basins (Biswas 1997):

*In favour:* Bangladesh, Brazil, Cambodia, Jordan, Lao PDR, Nepal, South Africa, Sudan, Syria, Thailand, Vietnam.

*Abstaining:* Argentina, Egypt, Ethiopia, India, Israel, Pakistan and France.

*Against:* Burundi, China and Turkey.

The General Assembly resolution adopted the ‘Convention on the Law of the Non-Navigational Uses of the International Watercourses’, and it was left open for signature by the States for some three years. By 2000, the time up to when it was open for signature only four countries (Cote d’Ivoire, Finland, Germany and Hungary) had ratified it or approved it. Even though some 106 countries voted for the Convention, only 16 countries have ratified it thus far.

## 1.7 Future Implications of the UN Convention

If the Convention on Non-navigational Uses of International Watercourses becomes a reality within the foreseeable future, which at present appears to be somewhat doubtful, a major issue is what its potential impacts are likely to be in terms of resolving existing and future disputes. In all probability, it is likely to have somewhat marginal impact on the resolution of existing and future water conflicts, even if it is ratified, for the following reasons:

First, not all countries that are currently parties to disputes on transboundary watercourses are likely to sign the Convention. For example, let us consider some

of the current conflicts and the voting patterns of the countries concerned on the above-mentioned Convention in the United Nations General Assembly.

<i>Euphrates-Tigris:</i>	Syria in favour, Turkey against, and Iraq not involved;
<i>Ganges:</i>	Bangladesh and Nepal in favour, but India abstained;
<i>Jordan:</i>	Jordan in favour but Israel abstained;
<i>Mekong:</i>	Cambodia, Laos PDR, Thailand and Vietnam in favour, but China against;
<i>Nile:</i>	Sudan in favour; Egypt and Ethiopia abstained and Burundi against;
<i>Plata:</i>	Brazil in favour but Argentina abstained.

This probably means that, if and when the Convention is ratified, there would be parties to specific conflicts who are unlikely to be signatories. As the past experience with the nuclear non-proliferation treaty has shown, moral pressures are likely to be of little value in the face of strong, entrenched, vested national interests. Experiences with this new Convention, even if when it comes into force, in all probability is unlikely to be any different.

Second, while the 1997 Convention could be considered to be an important benchmark, its two basic principles are similar to what had generally been accepted much earlier: equitable and reasonable utilization and obligation not to cause appreciable harm. Thus, the proposed convention, at least conceptually, did not break any new ground.

One of the main problems with the proposed Convention is that it is full of vague, broad and general terms, (Waterbury 1997), which can be defined, and in certain cases quantified, in a variety of different ways. Accordingly, expert advice can be easily 'tailored' to legitimize each country's political views and demands. Technical analyses can be produced to justify and support appropriate national positions. Such occurrences, however, are not new: they have happened in the past and will no doubt continue to occur in the future. Furthermore, the Convention does not give any practical guidance to the negotiators and no operational assistance to the technical experts. It simply outlines a very broad, general framework, within which everything is considered to be relevant and important. It is likely to contribute to the generation of significant differences of opinions among the negotiators and technical experts as to how such general articles should be interpreted in operational terms.

One can argue that the Convention outlines certain factors which could determine one of the fundamental principles, that of 'equitable and reasonable use'. According to the Convention, such a process should take "into account all relevant factors, and circumstances", including:

- geographic, hydrographic, climatic, ecological and other factors of a natural character;
- social and economic needs of co-basin countries;
- the effect of the uses of the watercourse on other co-basin states;
- existing and potential uses of the watercourse;

- conservation, protection, development and economy of use of the watercourse resources and the cost of the measures taken to that effect; and
- availability of alternatives, of corresponding value, to a particular planned or existing use.

Each one of the above factors cannot be defined uniquely or precisely since they are general and broad in character. Accordingly, when all the factors are integrated to define 'equitable and reasonable use', the countries in conflict would find it a very difficult task to arrive at mutually acceptable estimate. The estimates are likely to differ significantly even when groups of truly independent and objective experts make such attempts separately.

Third, the prevailing national political sentiments in each negotiating riparian countries, as well as the incentives to negotiate in good faith, are likely to be important factors in the resolution of all such conflicts. In addition, as the number of riparians increase to four or more in any transboundary basin, the importance and relevance of any proposed settlement could range from exceedingly important from one country to total indifference or even downright hostility, from another. For a basin such as the Nile, which has ten riparian, the incentives for all the countries to arrive at any specific settlement, at any specific point in time, are likely to vary from very high to of no discernable interest. Equally, the types of settlements preferred by the different countries are likely to vary somewhat significantly. The new Convention can at best be of only limited help in such cases.

Finally, ratification of the Convention is an important requirement. The Convention can enter into force on the "ninetieth day following the date of deposit of the thirty-fifth instrument of ratification, acceptance, approval or accession with the Secretary-General of the United Nations". The Convention was kept open for signature until 20 May 2000. During this 3-year period, only four countries ratified it (see Annex I). Legally, even though this deadline is long past, countries can still ratify this Convention. It is an open-ended ratification system, which means that whenever 35 countries ratify it, it would become an international legal instrument.

The critical fact that should be considered is that for nearly six years after the deadline expired, not even a single country ratified the Convention. In 2007, Germany and Uzbekistan ratified it. This means that, in over a decade, less than half the countries needed to ratify it, have done so. Thus, when this Convention will be ratified by 35 countries so that it becomes an internationally accepted legal instrument is now an open question. The probability that additional countries will ratify it in the foreseeable future must now be considered to be not so high, unless the Secretary General of the United Nations and/or one or more important countries take a special interest in its ratification.

The above considerations and other related factors most probably mean that agreements in individual transboundary basins will most probably continue to occur only through protracted negotiations between the riparian countries concerned. The Convention, even when it is ratified, is unlikely to speed up the time needed to reach mutually acceptable agreements in vast majority of disputes on transboundary river basins.

In August 2004, in Berlin, the ILA updated its Helsinki Rules on Transboundary Waters which were formulated in 1966, nearly four decades before. The new rules are now referred to as Berlin Rules. As noted before, the Helsinki Rules were an updating of ILA's earlier first effort to formulate a legal regime on transboundary waters at Dubrovnik, which were subsequently known as Dubrovnik Rules. These three rules show the progressive evolution of the legal regime for managing transboundary waters over nearly half a century. Since these rules have been formulated by a non-governmental organization, and not approved by the nation-states, they can probably be best regarded as guidelines for a legal regime for managing transboundary waters. However, since the UN Convention has still not been ratified, and is unlikely to be ratified for some years to come, the Berlin Rules have the moral and intellectual authority of ILA, a professional association with a proven, acceptable and effective track record in this overall area for some five decades.

## 1.8 Conclusions

Transboundary water management, like the management of any other natural resource in this continent, has been a gradually evolving process. Similarly, the international legal regime as to how transboundary water resources should be planned, managed and developed has also progressively evolved over the past half a century. As our overall knowledge-base in this complex area expands, experiences in managing transboundary resources increase over time and space, technology improves, social norms and aspirations change, water institutions become more efficient, and legal frameworks (both national and international) evolve, it should be possible to manage transboundary water bodies more and more efficiently in the coming years.

The legal regime for managing transboundary waters has evolved from the time of the Dubrovnik Rules that were first enunciated in 1956, to the Helsinki Rules, UN Convention on Non-navigational Uses of International Watercourses, and finally the Berlin Rules. While this gradual evolution has been an important achievement, these rules should mostly be seen as guiding principles during the negotiation process of a treaty on a specific transboundary water body.

Each transboundary water body is different, not only in terms of size, water availability and use requirements, but also because of its specific climatic, physical and environmental conditions, institutional and management capacities of the countries involved, historical relationships, power structure between the co-basin countries, economic conditions and social aspirations of the people concerned. Thus, it is highly unlikely that a specific treaty can be replicated willy-nilly in another location.

As the 21<sup>st</sup> century progresses, it is becoming evident that, like oil some two decades ago, the era when water could be considered to be a cheap and plentiful resource is now virtually over. Increasing water demands, limited availability of this resource and higher levels of contamination mean that the water management

profession will face a problem, the magnitude and complexity of which no earlier generation has had to face. Countries now really have two fundamental choices in terms of managing their transboundary water resources in the future: carry on as before with only incremental changes and a 'business as usual' attitude and thus endow their future generations with a legacy of mostly inefficient water management practices, including potential serious conflicts on transboundary water bodies; or to continue in earnest in an accelerated effort to plan, manage and use their transboundary watercourses collaboratively, constructively and fairly. Global experiences indicate that if a constructive and positive approach is adopted by the co-basin countries, it invariably contributes to the creation of a virtuous cycle where people of both countries become winners. The reverse of this approach equally brings into play a vicious cycle, where there are no winners. Potential benefits are simply lost both to the countries and to the people of the region concerned.

The root for the English word *rival* is from the Latin term *rivals*, which originally meant using the same river (*rivus*). But as the countries become increasingly interconnected in a rapidly globalizing world, nations sharing the same river should no longer consider each other as rivals. With properly conceived frameworks, management and use of the transboundary water bodies in developing countries should result in 'win-win' situation for all the parties concerned. Contrary to popular belief, these are not necessarily zero-sum games.

## 1.9 Acronyms

CNRET	Centre for Natural Resources, Energy and Transport of the Department of Economic and Social Affairs
ILA	International Law Association
ILC	International Law Commission
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
ZACPLAN	Zambezi Action Plan

## 1.10 References

- Biswas AK (1992) Indus Water Treaty: the Negotiating Process. *Water International* 17: 201–209
- Biswas AK (1994) *International Waters of the Middle East: From Euphrates Tigris to Nile*. Oxford University Press, New Delhi
- Biswas AK (1997) Special Issue on Management of International Waters. *International Journal of Water Resources Development* 13(3): 277–424
- Biswas AK, Cordeiro NV, Braga BPF, Tortajada-Quiroz C (eds) (1999) *Management of Major Latin American Rivers: Amazon, La Plata and Sao Francisco*. United Nations University Press, Tokyo

- Biswas AK, Hashimoto T (1996) Asian International Waters: From Ganges-Brahmaputra to Mekong. Oxford University Press, New Delhi
- Biswas AK, Unver O, Tortajada C (eds) (2004) Water as a Focus for Regional Development. Oxford University Press, Delhi
- CNRET (Centre for Natural Resources, Energy and Transport) (1978) Register of International Rivers. Pergamon Press, Oxford
- David LJ (1988) Environmentally Sound Management of the Zambesi River Basin. *International Journal of Water Resources Development* 4(2): 80–102
- Miller M (1996) Transformation of a River Basin Authority: the Case Study of Mekong Committee. In: Biswas AK, Hashimoto T (eds) Asian International Waters: From Ganges-Brahmaputra to Mekong. Oxford University Press, New Delhi, pp 226–244
- Nakayama M (1997) Successes and Failures of International Organizations Dealing with International Waters. *International Journal of Water Resources Development* 13(3): 367–382
- Waterbury J (1997) Between Unilateralism and Comprehensive Accords: Modest Steps toward Cooperation in International River Basin. *International Journal of Water Resources Development* 13(3): 279–290
- Wolf AT, Natharius JA, Danielson JJ, Ward BS, Pender J (1999) International River Basins of the World. *International Journal of Water Resources Development* 15(4): 387–427

## 1.11 Annex I

### **Ratification Status of the Convention on the Law of the Non-Navigational Uses of International Watercourses**

Article 36 stipulates: “1. The present Convention shall enter into force on the ninetyth day following the date of deposit of the thirty-fifth instrument of ratification, acceptance, approval or accession with the Secretary-General of the United Nations. 2. For each State or regional economic integration organization that ratifies, accepts or approves the Convention or accedes thereto after the deposit of the thirty-fifth instrument of ratification, acceptance, approval or accession, the Convention shall enter into force of the ninetyth day after the deposit by such State or regional economic integration organization of its instrument of ratification, acceptance, approval or accession. 3. For the purposes of paragraphs 1 and 2, any instrument deposited by a regional economic integration organization shall not be counted as additional to those deposited by States.”

Status: Signatories: 16; Parties: 14; Convention not yet in force

Article 34, the Convention shall be open for signature at the Headquarters of the United Nations in New York, on 21 May 1997 and will remain open to all States and regional economic integration organizations for signature until 21 May 2000.

Participants	Signature	Ratification, Acceptance (A), Accession (a), Approval (AA)
Côte d'Ivoire	25 Sep 1998	
Finland	31 Oct 1997	23 Jan 1998 A
Germany	13 Aug 1998	
Hungary	20 Jul 1999	26 Jan 2000 AA
Iraq		9 Jul 2001 a
Jordan	17 Apr 1998	22 Jun 1999
Lebanon		25 May 1999 a
Libyan Arab Jamahiriya		14 Jun 2005 a
Luxembourg	14 Oct 1997	
Namibia	19 may 2000	29 Aug 2001
Netherlands	9 Mar 2000	9 Jan 2001 A
Norway	30 Sep 1998	30 Sep 1998
Paraguay	25 Aug 1998	
Portugal	11 Nov 1997	22 Jun 2005
Qatar		28 Feb 2002 a
South Africa	13 Aug 1997	26 Oct 1998
Sweden		15 Jun 2000 a
Syrian Arab Republic	11 Aug 1997	2 Apr 1998
Tunisia	19 may 2000	
Venezuela (Bolivarian Re- public of)	22 Sep 1997	
Yemen	17 May 2000	