

# DEVELOPMENT, MANAGEMENT AND UTILISATION OF TRANSBOUNDARY WATER RESOURCES- THE GLOBAL SCENARIO

Er. Arnab Sarma, Ph. D. Scholar, MZLU, Brno (1999)

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## Abstract

The issue of transboundary water concerns more than 40% of world population. The fundamental aspects required to realise how this water may be managed in an effective manner are presented in view of the global scenario. Critical issues that require immediate attention are analysed in light of history and case studies. Synthesis of information gained from various case studies, current situation and defects found in propositions in order to make future progress and necessary recommendations to help countries that want to regulate their problems of shared natural hydro-ecosystem together are presented. Development of a coherent methodology would help to sharing this common problem. Present international regulations together with their effectiveness are presented.

## SOUHRN

Problém hraničních vod zajímá více než 40% světové populace. V této práci jsou prezentovány základní aspekty pro vytvoření představy, jak s touto vodou může být efektivně nakládáno. Ve světle historie a modelových studií jsou zde analyzovány rozhodující otázky, které vyžadují okamžitou pozornost. Jsou zde sloučeny informace získané z modelových studií, současná situace a nedostatky, nalezené v návrzích, zabývajících se budoucím pokrokem, ale i nezbytná doporučení na pomoc zemím, které se chtějí zabývat problémy sdíleného přírodního hydro-ekosystému. Uchopit tento obecný problém by mohl pomoci i vývoj jednotné metodologie. V práci je prezentována také účinnost současných mezinárodních nařízení. Rozvoj, řízení a využívání hraničních vod v budoucnosti proto musí zahrnovat aspekty jako citlivá stavební opatření, zpřísnění zákonných nástrojů, posílení vládních vlivů a využití ekonomických opatření.

## Introduction

A large part of the world's freshwater supplies are located within basins and aquifers that cross international boundaries. More than 200 rivers flow through two or more nations with political borders that cut across watersheds. The problem arises from competition for water within and between countries as and when supplies fall short of requirements. At present, international law offers little help in resolving water conflicts since no legal framework governs the allocation and use of international waters, nor does it recognise the beneficial use of water for ecosystem. The International Law Commission (ILC) of the United Nations and International Law Association (ILA) have put forward a set of principles and four obligations in this regard. However, in reality, these principles offer insufficient practical guidance. Among the factors that pose problems for efficient and equitable allocation and management of water resources are variability and uncertainty of supplies, the complex interdependencies among users and the increasing scarcity and raising cost of water. There are clear incentives for individuals and countries to capture and use the resources before it flows beyond their control i.e. to build reservoirs upstream of the border. At the same time, there is little incentive to conserve and protect supplies for downstream users. Water sharing and prevention of conflict depend on treaties among countries that are riparian to the same river.

However, few treaties exist that include all countries within the river basin. Among river basins and regions recognised as hot spots are the Jordan, the Euphrates, the Nile, the Ganges, the Brahmaputra and the Aral Sea tributaries.

## **MATERIAL AND METHODS**

### **Present status of shared water resources**

The international charter of a waterway is determined by geography, if it flows through two or more countries or/and by arbitration, if the riparian state does not consider itself to be in full possession of its sovereign national powers from a national point of view. According to the United Nations, the number of rivers shared between several countries has grown to about 245 due to the split of the USSR and Yugoslavia and due to appearance of new states. Among the 245 water basins, 70 are located in Africa, 55 in Europe, 40 in Asia, 33 in South America, 24 in Central America and 6 in the Middle East and the rest in other parts of the world. It is interesting to note that the linear notion of a transboundary river, that developed from the river's navigational function, enlarged initially to encompass the basin supplied by the river's tributaries and later to underground water and the water table that contribute to the water supply of the river. Thus, more than 40% of the continental fresh water resources are shared. This reflects the interest that the sharing nations have for transboundary water resources management. The Paris conference in March, 1998 underlines in its declaration that a shared vision for the riparian countries is important for the effective development, management and protection of transboundary water resources. The Rio Declaration and the United Nation's General Assembly put emphasis on co-operation among riparian states in matters relating to transboundary water resources, taking into account the interests of all the states concerned. Unfortunately, a true international law concerning waterways does not yet exist. What we have now is a mosaic of juxtaposed texts, where there continuously appear the component tendencies and principles of a law that needs to be defined in the coming years. The international waterway law appears as a law emerging from nearly 200 legal constructions implemented on different waterways of earth. This law was initially limited to the regulation of relationship between states in order to insure that interests or particular uses such as navigation or hydroelectricity were shared. It is currently confronted by demands growing in number and quantity linked mainly to demographic growth, irrigation and flooding, in a geographical context that is at times difficult, where the concern for national sovereignty is sometimes put above concerns for the protection of water resources. This is why a brief history of conventions and treaties enable us to understand the present development.

### **Brief history of transboundary agreements**

Historically, the first manifestation of interdependency problems relating to shared waterways appeared through the very sensitive question of the delineation of borders between countries, a question that is still very delicate since the course of a river changes with time. From the middle ages up to the 1<sup>st</sup> World War, the freedom of navigation on the large rivers was a frequent problem concerning rivers of Europe (Po, Rhine, Oder, Danube and Elbe) and later for the Congo and Niger. In most cases, the freedom of navigation concerned not only the signatory nations but also third party nations. Followed by this, a new series of international agreements came about concerning mainly development of hydroelectricity. Just after the 2<sup>nd</sup> World War when urban development and industrialisation had progressively altered the quality of river water, conventions were held and treaties signed regarding water quality. International agreements treating

underground water are not numerous and are rather of recent origin. However, various treaties have been signed in this direction involving as many as 40 countries.

### **Definition of the problem**

It has been seen that agreements between parties accept restrictions regarding sovereignty of states over their rivers when rivers are considered to be an international and shared resource. The first principle that emerges is that of equitable and reasonable use, requiring that a state uses the water of a waterway in a manner which does not deprive other riparian states of their rights of equitable and reasonable use. This rule is called the non-injurious use of the territory. The ILA and ILC have put forward the following four obligations in use of transboundary water.

- To inform and consult with water-sharing neighbours before taking actions that might affect them
- To exchange hydrologic data regularly
- To avoid causing substantial harm to other water users
- To allocate water from a transboundary river basin reasonably and equitably

Water sharing and prevention of conflict depend on treaties among countries that are riparian to the same river. However, few treaties exist that include all countries within the river basin. European law elaborated by the European authorities makes up a unique experience in legislative standards and techniques, freely consented to by a growing number of states; the original 6 countries growing to 15 countries today. The goal is to reach a good ecological state of surface and underground water by 31<sup>st</sup> December, 2010.

## **DISCUSSION**

### **Need for a common management**

Different technical problems encountered by the states have led to organise to resolve their problems either because they were dependent on actions carried out by certain of the states among them or because they were conscious that, in acting together, cost and efficiency would be improved. The United Nations experts recommended a very progressive process between riparian countries based first on contacts and informal meetings between water specialists to develop reciprocal confidence gained from personal contacts. This could involve first the exchange of data, the reciprocal knowledge of problems and the way in which these problems have been resolved. These contacts and exchanges between specialists should lead to a technical consensus on the available data and the methods used to collect the data as well as on the projects to be carried out. Some of the main considerations should be- the upstream and downstream impacts; the cost of the co-operation of the undertaking including the collection of data, as well as on sharing project cost; the restriction of freedom and sovereignty and the financial gains that can be generated; and the conditions of fund donors and the competition of these donors.

### **Progresses to be made**

Important progress has already been made in the last decade to codify the principles and regulations with the Helsinki Convention and the New York Agreement of 1992 and 1997 respectively. However, fears of certain countries still persist. Many countries refused to participate in discussions about an ambitious project for a universal international convention on the international rights of shared rivers at the 1998 conference of Lebanon is a tangible proof of this

fear. In spite of all these problems, we must persist with our progress step by step. The following principles adopted by the United Nations should be widely approved.

-- the necessity of developing a coherent network of measurements and data exchanges between the riparian states

-- the utility of increasing the means for training specialists in the catchment areas and for informing the public

These two important points have been explained during the Strasburg Seminar of November, 1997 entitled Concerted Management by Catchment Area: from consultation to decision making, organised by the French water agencies. Further, the financing organisations of the United Nations could contribute by lowering the interest rate for developing countries and increase the percentage of aid given.

### **Future strategies for management**

Some of the possible steps in this direction could be as follows:

#### **Confidence building measures**

It includes a base of confidence building measures to help the participating countries establish a sustained collaboration. This is to facilitate the opening of a dialogue or to gather and disseminate the best information and data to be used for co-operative management activities. Identification of the sources of potential conflicts and to evaluate mechanisms that allow preventive measure to be taken to stop the eventual development of problems is also to be included.

#### **Reinforcement of legal instruments**

Measures must be taken to complete the United Nations Conventions on the use of international waterways for purposes other than navigation by regional agreements- and sometime bilateral agreements- founded on this convention. Further, these principles should be incorporated into national legislation when necessary.

#### **Strengthening government capacity**

Government capacities regarding the management of water resources should be strengthened especially in developing and transition countries. Efforts will also have to be taken to correct the imbalance of capacities between countries. Aid must be provided that enables the governments to develop the necessary competencies that would enable them to collaborate in the most equitable and efficient manner with the other parties, particularly with international partners, the private sector and local community-based organisations.

#### **Use of economic instruments**

Water being an economic good and collective property, it is advantageous to reconcile economic, social and environmental objectives harmoniously in using economic instruments. While using the economic instruments, negative effects that low-income people and household experience must also be taken into account. New approaches should be promoted in order to assure a more

efficient division of available water resources particularly in regard to the rights of the resource users.

### **Case studies from international river basins**

The synthetic results of the analysis carried out on few international river basins are presented here that could benefit other countries with similar problems of management of shared water resources.

#### **The lake of Geneva**

Geneva lake has a capacity of 89 billion m<sup>3</sup> with an area of 582 km<sup>2</sup> and is the largest Alpine and sub-Alpine lake of western Europe. It is shared between Switzerland and France and has been marked by a long history of conflicts, reconciliation and conviviality/cordiality between the two countries. Agricultural, industrial (chemical, pharmaceutical, metallurgical and paper) and agri-food activities generate pollution loads that end up in the lake, notably phosphorus produced by the urban and livestock sectors. The water quality problem started in the beginning of 1950 and in 1952 a commission of unofficial character was constituted of various discipline specialists that monitored the water quality from 1957. On this basis the International Commission for Water Protection of the Geneva Lake (CIPEL) was created in a French-Swiss convention in Paris on November 16<sup>th</sup>, 1962 with the basic objectives of preserving and restoring the ecological water quality and the aquatic environment of the Geneva lake. The following aspects were taken into consideration.

- .utilisation of the lake water as drinking water with simple treatment.
- practice of leisure activities (fishing, bathing, nautical etc.) in the optimum conditions.

The commission has done remarkable work of communication and sanitation in coordination with all its local partners on both sides of the watershed.

#### **The Rhine river**

The Rhine with a length of 1300 km and having a basin area of 2,20,000 km<sup>2</sup> extends over the territories of Switzerland, Germany, France, Luxemburg and the Netherlands. The Netherlands, situated at the very downstream of the system took the initiative to gather the riparian countries to deal in common the problems of protection of the Rhine water. As a result the International Commission for the Protection of the Rhine Against Pollution (Commission Internationale pour la Protection du Rhin Contre la Pollution- CIPR) was created in Basen on 11<sup>th</sup> July, 1950 which was subsequently institutionalised officially on 29<sup>th</sup> April, 1963 in Bern. According to the agreement, the commission performs the following functions:

- prepare and commission any research necessary for determining the nature, extent and origin of Rhine pollution and evaluate the results of this research.
- propose to the signatory governments measures for protection of the river against pollution.
- make necessary arrangements between the signatory governments in respect of the water of the Rhine.

The chairmanship of the commission is assumed in turns for three years by the signatory governments and the governments take over the commission work expenses according to these percentages- Germany, France and the Netherlands (24.50% each), EEC (13.0%), Switzerland (12%) and Luxemburg (1.5%). The various investigation subjects are distributed between three groups of work called- the water quality, ecology and effluent discharges.

Some of the other basins where water resources are shared by various countries are- the shared Atlantic watersheds of the Iberian Peninsula (Spain and Portugal), the Senegal River (between Mali, Mauritania, Senegal and Guinea) and the Oder river (between The Czech republic, Germany and Poland)

### **Essential lessons from case studies**

From the various number of case studies carried out in various parts of the world, some specific lessons can be drawn on the objectives, structure, functioning, financing, approach and methodology of what could be an institution for shared water management which would play its role with success and to the satisfaction of all concerned parties. The essential points that could be made for these experiences are-

-- Commission establishment to be preceded by a dialogue phase between experts of the concerned parties, working within an unofficial structure to arrive at an agreement on the technical base line situation.

-- Necessity to improve the present situation, objectives that are acceptable to all and the means to achieve them have to follow the first phase.

-- Political phase to be initiated next, with the preparation and signing of conventions, with the pursued objectives and establishment of the commissions with their role and competence.

-- Additional protocols or clauses could be signed when it was necessary to implement programmes with well defined objectives.

-- The structure of the commission need to comprise, on one hand the technical branch with the working groups in charge of the various sectors and coordinator (s) and on the other hand, the political level assured by the planning committee.

-- The chairmanship of the commission, committee and ministerial conferences between the signatory countries need to be rotated. This is essential for an integrated management of the shared basins.

-- financing of the commission, committee needs to be assured in an equitable manner by the concerned parties as far as possible. However, it would depend on the economic level of the participating countries. Proportional financing is one way to solve this problem.

### **Charter for the International Commission of Rivers**

It was strongly expressed during the Paris Conference in March, 1998 on **water and sustainable development** that, it was necessary to build a **Code** or a **Charter**, regrouping the imperative rules and a set of options, drawn from the existing commission experience. Those countries, which decide to cooperate in the management of their common water, would have a

strong basis they can adopt to their wishes and to the specificity of the basin. Various aspects in this regard are presented below:

### **The basin concerning the participating countries**

The water measurement network must provide coherent data from a country to the other, especially for countries sharing water of the same basin. Priority should be given to national and international harmonisation and standardisation of definitions, to the development of user-friendly formats to facilitate access to and exchange of data. Further, the participating countries, according to their geographical zone should refer to some international programmes such as- Eurowaternet network of the European agency for environment, the water sector of the euromediterranean system SEMIDE, the Global water Data Centre and the World Hydrological Cycle Observing System of the World Meteorological Organisation, the FRIEND network of the IHPs of the UNESCO and FAO's AQUASTATS, the GEMSWATER programme of the UNEP and other agencies from many regional networks. A second step should be in training for professionals, operators as well as the sensitisation, information and education of users.

### **The preliminary concentration**

As has already been mentioned, the participating countries should establish contact and exchange information at the technical level first followed by contacts at administrative level. After this the objectives may be set describing the water cycle in relation to the requirements of its inhabitants and their activities, showing local problems in each part of the basin and those, either existing or susceptible to appear between the areas of the basin belonging to each of the riparian countries.

### **Creation of an International Entente (Accord/Arrangement) of Basin Commissions (IEBC)**

As for the national basin organisations, created in several countries, which have set up an International Network of Basin Organisation (INBO) to enable exchanges of experiences for mutual benefit, it seems that the creation of an IEBC would be very desirable. In fact the oldest commissions that have acquired considerable experience are already being requested to provide assistance or advice to the new commissions or to those having difficulties and problems e.g. the Commission of the Rhines (CIPR) is advising to other commissions like the Commission of the Danube.

### **Recommendations to the international and regional authorities**

In additions to the normal functions, the international and regional authorities have few other basic roles to play in the international basins as follows:

- To provide neutral expertise to help in the resolution of difficult situations.
- To encourage the commissions in making coherent their measurement networks and in implementing training actions for the technicians as well as for the users.
- To assist the least wealthy states to act at the same level as the others, without external assistance or with more reduced assistance.

The first role is in the tradition of the World Bank and other United Nations institutions such as FAO, WHO, UNDP and the UNEP. This would be easier if the leader of the international organisations would be signatory to the international protocol. The second role related to the financial assistance these organisations provide to the states (or to the commissions) for the realisation of works in the programme. It can then be decided regarding the relative proportion of assistance that will be dedicated to training, improvement of coherency in measurements and other related works. The third role is the most important of all since, with adapted loan interest rates, they can contribute to the realisation of the programmed works in rich and poor countries, as scheduled, preventing that delays in certain parts of the basin would compromise the efficiency of the joint actions.

## **Conclusions**

Based on the above discussion and analysis the following specific conclusions can be drawn:

- Action of bilateral and multinational institutions in the field of transboundary freshwater resources development and management should be enhanced and facilitated.
- Global Environment Facility should take into account this Programme of Priority Action under its existing relevant focal areas to build physically-based operational programmes to meet Global Environment Facility guidelines.
- Capacity building projects should include actions to promote the dissemination of information and awareness among technical and political decision-makers.
- Decision at expert level should be endorsed as quickly as possible to avoid political delay.
- Actions need to be taken to support preliminary feasibility studies at the national level consistent with overall national development strategy in the participating countries.
- *Management of transboundary water is not possible unless the states concerned accept a restriction of their sovereignty regarding water resources i.e. each must accept the fact that there are other stakeholders sharing the same water.*
- Above all, it should be kept in mind that water is our common global property and we must do everything possible to safeguard it and manage it for the benefit of our civilisation.

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