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Interstate water rights: a case adjudicated by the Supreme Court of Justice of Argentina

In December 1987, the Supreme Court of Justice of Argentina reached a final judgement in the first case concerning interstate rivers to be brought before it (Province of La Pampa vs. Province of Mendoza). Argentina - a country where water domain is vested in the provinces - is governed by a federal government with specific powers of jurisdiction. Any conflicts between provinces concerning water rights must be adjudicated by the Supreme Court.

The case of La Pampa vs. Mendoza established rules for the allocation of waters of interstate rivers. In doing this, the Court was following precedents of international law and jurisprudence, particularly as established in the United States.

The controversy focused on the Atuel River, which the Court ruled was an interstate river. The province of La Pampa sued, claiming that its possessory rights on public interstate waters had been challenged by the province of Mendoza's autonomous development of such waters. La Pampa felt that Mendoza should be compelled to comply with resolution 50/49 of the Water and Electric Energy Department which required that future uses be jointly regulated by the two provinces.

The Court considered several points in trying to reach a decision. Some, such as the question of the scope and extent of federal powers over federal territories, were confined to the specifics of the historical process underlying the creation of the Argentinian provinces. Others, which apply more generally to the field of interjurisdictional water law, will be summarized below.

According to the Court, conflicts between states may be compared to disagreements between sovereign nations which require solutions in a diplomatic manner. In such cases, the burden of proof - the onus probandi - is on the province or state which is suing. It must prove beyond a doubt that there has been injury of serious magnitude to its interests.

Cases between states are also decided according to federal, state and international law but the determination of the relative rights of contending states in respect of the use of streams flowing through them does not depend upon the same consideration and is not governed by the same rules of law that are applied to similar questions of private right.

The specifics of the cases brought to the Court by the two provinces required that the Tribunal be given broad authority to establish the law applicable in the case, which in principle would be constitutional law (national or comparative), federal common law, or public international law. Therefore the case should not be governed by the principles of private civil law.

History of the area

After rejecting the application of civil law, the Court discussed the case further. It paid special attention to the history of water development, pointing out that in Mendoza irrigation went back to the last century, and that by 1939 there were 70,000 people living in the area of the Atuel's influence.

As of 1980, Mendoza had 100,000 people living in the area benefited by the river, while La Pampa had 3,024 inhabitants in that region. The Court noticed that La Pampa faced great difficulties in developing irrigated agriculture because droughts and lack of transportation severely restricted development.

While significant institutional developments took place in Mendoza, the same was not true in La Pampa. Mendoza developed criteria for water use, granted water rights and applied them beneficially, but La Pampa, for various reasons, did not have the same opportunities. The process of uneven economic development resulted in large volumes of water being used in Mendoza, while relatively little water was used in La Pampa. Furthermore, the developmental process of Mendoza was largely the result of private enterprise. As a result, the area of the river's influence in Mendoza has been endowed with dams, roads, railroads, bridges, towns and important industrial and commercial centres. Although the area is arid, it is irrigated and drained by means of a network of canals, which according to expert evaluation, are operated and managed in a reasonable manner.

Economic output

The efficiency of the irrigation system in Mendoza is estimated at 30 per cent, which is within the range of efficiency of other irrigation works. While efficiency values could be improved, technical, human and financial costs limit any such programme. With improvements, the efficiency of the system could be raised by 50 per cent. However, current efficiency values fall within the range of other irrigation systems, both in Argentina and in other countries.

In addition, the Court took into account the fact that the efficiency of any technology for water use is a relative concept. While wilful or indifferent waste of water is not to be tolerated, inefficiency stemming from technical or financial limitations is a different matter. It would be unreasonable to require an underdeveloped state to meet the standards of highly developed countries. Accordingly, the irrigation system of the Atuel River in Mendoza, although deficient, does not show a level of inefficiency leading to an unjustified waste of the waters of the river.

The Court also discussed alternative ways of increasing the availability of water within the region. It pointed out that to offset the water deficits of the area, prospects should be analysed for better irrigation methods and construction of waterworks to recover losses in the hydrological system.

The cost of constructing the needed waterworks is in the order of \$US 676 million, to which maintenance and operational expenses should be added. The costs and their financing go well beyond any financial and economic justification if compared with the relatively meagre economic results that might be obtained from the northwest region of La Pampa province. Furthermore, the benefits of waterworks would not be felt until the second half of the next century.

According to the Court therefore, the actual use of water is within the range of efficiency normal for most countries, and to construct waterworks would be well beyond the financial capabilities of the parties, without attaining an acceptable rate of return. Under the circumstances, the Court found that the present uses of water in Mendoza province are not excessive.

Applicable law

In considering the case, the court followed precedents established by United States federal common law and public international law.

The Court emphasized the importance of equitable apportionment and the relevance of existing uses as an element in deciding what would be equitable in a particular case. For example, the rulings of the United States Supreme Court in the cases of Colorado vs. New Mexico, 1984 1/ and La Pampa vs. Mendoza Province, Supreme Court of Argentina, 1987, were particularly relevant in clarifying what would be considered equitable. According to those rulings, beneficial uses and established economies should be protected within a frame of flexible decision-making, where several factors such as climate, past uses, available volume etc. should be considered.

In this context, the all-important principle is that existing economies must be protected as their elimination would cause immediate damage while future benefits would be hypothetical.

At the same time, conservation measures aimed at improving efficiency of use can be applied only where financially and physically feasible. The Court also noted the fact that the principle of equitable use is accepted as a principle of international common law.

Further justification of the decision was based on the concepts of limited sovereignty, community of interests, equality of right, equitable distribution and apportionment, and interdependency and unity of the river basin and on previous consultations. The Court noted that "equality of right" did not imply "equal division", since the principle had to be modified by the circumstances surrounding each situation.

In addition, efficiency in use should not be assessed according to the highest possible standard, but rather to what is reasonably efficient, as determined by the technology and financial resources available to a particular State. In any event, the States of the basin should co-operate

and negotiate according to principles of good faith and neighbourliness in order to reach an agreement for future uses beyond what is now recognized by the parties.

The Court's decision

The possessory action sought by La Pampa was rejected. Mendoza was allowed to keep the rights to actual consumptive use, but without excluding, in principle, the right of La Pampa to participate in future uses of the interstate watercourse. It was the feeling of the Court that interstate rivers should be used according to principles of equity and equitable use. Existing uses should be respected, if they respond to reasonable standards of efficiency as assessed according to the practices of other irrigated areas, both in and out of the country. New waterworks can only be justified if they are within the financial and technological possibilities of the responsible state and when benefits can be expected. Riparian states should negotiate, co-operate and reach agreements in good faith and in the spirit of good neighbourliness, with a view to reaching an equitable agreement and ensuring reasonable participation in the benefits of the watercourse.

River basin resources: perspectives for their development and conservation

The report of the World Commission on Environment and Development which was transmitted to the forty-second session of the G.A. (A/42/427) called for a new focus on the sustainable use and management of transboundary ecological zones, systems and resources. It recognized that most non-island countries share at least one international river basin and that in many countries the entire national territory is within an international river basin. However, many international river basins are not covered by any international agreement, and very few have co-operative institutional arrangements. These gaps are particularly acute in Africa, Asia and Latin America.

The report endorses the potential usefulness of the river basin as a unit for both development and for conservation of natural resources. It discusses the problems faced by river basin organizations of developing countries, highlighting the background of limitations against which they operate, and emphasizing the fact that in order for them to be successful there should be an easing at the highest level of restrictions imposed upon them. Some of the difficulties under which they operate are summarized below.

Most developing countries face economic pressures that reduce their investment capabilities and lead to the deterioration of their natural resource base. The reduction in investment capabilities prevents the construction of waterworks, the development of human resources and the expansion and diversification of economic activities. Debts that they cannot pay force African nations relying on commodity sales to overuse their fragile soils, thus turning good land into deserts. In Latin America, the continent's natural resources are now being used not for development but to meet the financial obligations of creditors abroad.

A majority of developing countries have lower per capita incomes than when the decade began and rising poverty and unemployment have increased pressure on environmental resources. Many Governments have cut back efforts to protect the environment and to bring ecological considerations into development planning.

The two interlocking crises - economic and ecological - pose problems for institutions, national and international, that were established on the basis of narrow preoccupations and compartmentalized concerns. Reorientation of this process is a main institutional challenge, and the changes required involve all countries, large and small, rich and poor.

Problems are not just related to organizational structures nor outside aid; internal policies are also a major constraint. By not supporting farmers and by subsidizing urban dwellers little will be done to boost agriculture, whether within the confines of a river basin organization or not.

Watershed conservation is a lost battle when extreme poverty leads to overgrazing, marginal agriculture, or forest degradation. It is also a lost battle when financially hard-pressed countries exhaust their soil to produce cash crops. However, the destruction of a source of production (paramount to liquidating capital) is not part of the cost benefit equation. There is no system of accounts for destructive poverty.

Hydroelectricity is one of the safest sources of clean renewable energy and one of the main outputs of river basin development. Yet, lack of capital and investment restrictions under "financially sound" adjustment programmes make it impossible for countries to draw further benefits from hydropower. This is true to such an extent that the Manantali Dam in Mali, West Africa has been hailed as the last of its kind given the general move away from major dam construction.

Restrictions on developing countries are very severe; the World Bank noted that since 1980 the average income in Latin America has been reduced by one seventh and by one quarter in Africa. 2/

Along the same lines, the report of the Commission states that growth in many developing countries is being stifled by depressed commodity prices, protectionism, intolerable debt burdens and declining flows of development finance. If living standards are to grow so as to alleviate poverty, these trends must be reversed. The present level of debt service of many countries, especially in Africa and Latin America, is not consistent with sustainable development. Debtors are being required to use trade surpluses to service debts and are drawing heavily on non-renewable resources to do so. Urgent action is necessary to alleviate debt burdens in ways that represent a fairer sharing between both debtors and lenders of the responsibilities and burdens.

The report states further that current arrangements for commodities could be significantly improved: more compensatory financing to

offset economic shocks would encourage producers to take a long-term view, and not to overproduce commodities; and more assistance could be given from diversification programmes. Commodity-specific arrangements could build on the model of the International Tropical Timber Agreement, one of the few that specifically includes ecological concerns.

The river basin is a proven unit for sustainable economic development and environmental control of water resources. Yet the magnitude of financial requirements, organizational considerations and new policy approaches may deter or hamper the launching of new efforts.

Referring to the problem on a larger scale, the Commission points out in the report that the onus of change does not lie with any one group, but that all nations have a role to play in changing trends. Even countries that performed engineering feats in river basin development today face unstable commodity and energy markets, which jeopardize the outcome of investment decisions showing positive cost-benefit relationships at the planning stages.

The limitations faced by developing countries are formidable. They affect all their endeavours, including river basin development. Thus, river basin organizations should not be viewed as self-contained units for organization and technology, but rather as programmes and institutions which, if they are to be successful, need to be supported and conceived of as elements of a general programme to overcome poverty and environmental degradation. Without larger programmes and broader perspectives for the economic relief of developing countries, success at the basin level might, at best, be limited.

At the same time, the domestic components of river basin programmes should be considered as elements in plans for socio-economic development and environmental conservation, to be monitored and co-ordinated by those responsible for planning, economic development and the environment.

Likewise, programmes for river basin development should identify and assess those factors which, as components of the institutional and legal structure of basin countries, inhibit and limit greater productivity and enhanced conservation.

Council of Europe: recommendation concerning pollution of the Rhine River

The Assembly of the Council of Europe, taking into account previous resolutions related to pollution of the Rhine River and the effect on environment, health, water supply and irrigation, on 29 January 1987, adopted 1052 concerning pollution of the river.^{3/} The resolution is set forth below.

The Council of Europe:

(a) Supports the appeal to the Committee of Ministers by the Secretary-General and the President of the Standing Conference of Local

and Regional Authorities of Europe for a speedy and final adoption of the draft convention on the protection of international watercourses against pollution (section 16);

(b) Requests the signatory states to the European Outline Convention on Transfrontier Co-operation between Territorial Communities or Authorities to instruct their competent authorities to fully implement its provisions, in particular with regard to an early warning and information system for all the populations concerned (section 17);

(c) Recommends that the Committee of Ministers:

(i) Examine the problems of international liability linked to the occurrence of transfrontier disasters of this kind, and take all legal action necessary to secure both the safeguard of the environment and the maintenance of a high-quality water supply;

(ii) Consider the drafting of a European convention on the protection of the environment, providing effective international control and stating strict rules to establish the right to a healthy environment, whilst stressing the "polluter pays" principle even at the international level;

(iii) Urge the Governments of Member States to intensify research at the national and European level regarding the short- and long-term effects of river pollution on fish life and, through consumption, on human health;

(iv) Invite the Governments of Member States to review most urgently their legislation, in particular with regard to the production, storage, transport and disposal of chemicals, and to report to the Council of Europe, so that common measures can be adopted at the European level;

(v) Explore the possibility of declaring certain particularly affected rivers and seas, among them the Rhine estuary and adjacent parts of the North Sea, as "special protected areas" requiring particularly stringent anti-pollution measures (section 18).

Draft charter on international co-operation and ground-water management

The Committee on Water Problems of the Economic Commission for Europe convened a meeting for preparation of a draft charter on ground-water management from 14-16 December 1987. The draft article on international co-operation and ground-water management is reproduced below.4/

(a) Concerted endeavours to strengthen international co-operation regarding the harmonious development, equitable use and joint conservation of ground-water resources located beneath national boundaries should be intensified. To this end, existing or new bilateral or multilateral agreements or other legally binding arrangements should be supplemented, if necessary, or concluded in order to place on a firmer basis

co-operative efforts among countries regarding the protection of those ground-water resources which can be affected by neighbouring countries through exploitation or pollution. In order to implement such co-operation, joint commissions or other intergovernmental bodies should be established;

(b) Co-operative arrangements could include: data collection, standardization and exchange and establishment of joint inventories; research and training; planning and demand-management, joint control and monitoring of activities with regard to quantitative and qualitative aspects of ground-water protection; elaboration of compatible monitoring methods, standards and permits; establishment of adjacent protection zones; establishment of commonly agreed land-use plans and practices; monitoring of surface and ground-water resources' behaviour and interdependence; and the obligation to give notification concerning any activity which might modify the volume and/or the quality of ground water.

Co-operation in the field of transboundary waters

To judge from the information in several country monographs, new and broader approaches to water management are becoming apparent in agreements of ECE Governments on co-operation in the field of transboundary waters. The Ministerial Conferences of the International Commission for the Protection of the Rhine against Pollution, which were held in autumn 1986 following a major pollution accident, have set up ecological objectives for the newly re-examined protection policy. The riparian countries of the Danube River, in their Declaration of 1985, agreed on objectives of the same character. Similar developments have been reported in respect of both bilateral and multilateral co-operation concerning other transboundary water bodies. A tendency has also been noticed to widen the scope of activities conferred on the joint bodies for the implementation of agreements, in accordance with the objectives set out in ECE water policy declarations and principles.

Recent developments in the ECE region thus show that the broadening approaches to water management at national levels are beginning to gain acceptance also in the sphere of co-operation concerning transboundary waters. This is entirely in line with the basic policy statements drafted by the Committee on Water Problems in recent years. The Declaration of Policy on Prevention and Control of Water Pollution, including Transboundary Pollution (E/ECE/1084), adopted by ECE in 1980, states that "the conservation of water resources and the prevention and control of water pollution are integral parts of a comprehensive policy and call for international co-operation". The Declaration emphasizes that water pollution control should "take into account possible interaction of pollutants on air, land and water and aim at preserving the natural quality of surface and ground water and protect the environment which depends on such water". In the same vein, the ECE Principles on Co-operation in the Field of Transboundary Waters, adopted by the Commission in 1987, declares that transboundary waters do not lend

themselves to purely national approaches because natural phenomena and human activities, including effects originating beyond the transboundary area itself, may make themselves felt across borders, and require co-operation among riparian countries.

International law is by its very nature slow to move, but comments by several reporting Governments indicate that progress is being made in accordance with the ECE policy declarations and recently adopted principles. A better general understanding of the functioning of water systems and underlying relationships has led to a greater willingness to view in a broader perspective the problems arising in transboundary waters. For water pollution control, the trend has been towards improved co-ordination of national monitoring on the basis of jointly agreed measurement standards and exchange of information on, and sometimes joint assessment of, potential transboundary consequences of national development projects or activities. Even proposals or the introduction of liability for damages related to transboundary pollution are being considered. There have also been remarkable developments concerning institutional arrangements for the management of agreements. New agreements usually tend to include provisions for means to implement the commitments, inter alia, by establishing joint bodies with specific levels of authority. The improving integration and co-ordination of the institutional framework for water management at national levels will in many cases facilitate the negotiation as well as the management of agreements on co-operation in the field of transboundary waters.

Some transboundary water treaties in the ECE region date back to the beginning of the century. For the most part, however, the currently valid treaties, agreements and other arrangements have been concluded in the last three decades. Recent agreements or amendments to existing agreements generally reflect the new tendencies in water policies of ECE member countries. Prevention of damage by water and apportionment of water resources continue to be important questions for transboundary negotiations and agreements, but quality control and protection of aquatic ecosystems in the long-term common interest of riparian countries are gaining in importance.

International Commission for the Hydrology of the Rhine Basin

The International Hydrological Decade (IHD), which was launched in 1965 upon the initiative of UNESCO, had as one of its objectives the stimulation of regional co-operation in the field of hydrology. The basin of the Rhine River is obviously such a region. Representatives from the Rhine basin countries of the Federal Republic of Germany, France, the Netherlands and Switzerland first met in 1967, as recommended by the IHD, and in 1970 they established the International Commission for the Hydrology of the Rhine Basin (CHR). Austria and Luxembourg became members of the Commission at a later date. The Commission maintains a permanent secretariat in the Netherlands; the chairmanship of the Commission rotates every three years.

The first important decision taken by the Commission was that it would concern itself mainly with obtaining quantitative data and insights concerning discharges. Subjects such as navigation and pollution loads were intentionally omitted because these subjects were handled by other commissions such as the Central Rhine Navigation Commission and the International Commission for the Protection of the Rhine against Pollution (CIPR/IKSR). Studies in co-operation with these commissions are being prepared.

The Commission's objective was to make a study of hydrological phenomena in the Rhine basin, complete an inventory of existing data and improve methods of forecasting. It was decided to publish such an inventory in the form of a monograph on the Rhine basin. After many years of intensive co-operation between hydrologists, meteorologists and geographers from the CHR member countries, the monograph appeared in 1978, consisting of three parts: a textbook, a section on tables and an atlas containing maps and graphic presentations.

The textbook describes the geography and geology of the Rhine basin, its climate, hydrography and hydrometry, discharge, meteorological and hydrological circumstances during some wet and dry periods, and the application of hydrological forecasting models. In the tables section, a large quantity of information concerning gauging stations, precipitation gauges, discharges, evaporation etc. is listed. The atlas contains 67 maps and figures, presenting information on subjects such as morphology; geography; geology; pedology; geohydrology; land use; average precipitation depths and numerous hydrological characteristics, such as longitudinal profiles and cross sections of the Rhine and a large number of its tributaries; discharge-duration curves and hydrographs for water level and discharge.

Upon completion of the monograph, the Commission began work on a new research programme consisting of the following topics:

(a) A study on standardization and processing of hydrological data in the Rhine basin. A working group was established to harmonize measurements and data-processing. The working group prepared a report on the calculation of high- and low-discharge probabilities in the Rhine basin describing the calculation methods used in the member countries of the Commission and presenting a survey of the distribution functions applied. In the same year, the working group, as a result of German-Dutch co-operation prepared a report on discharge measurements in the German-Dutch border area, clarifying the differences that have existed for several decades between the discharge rate figures of the Rhine on both the German and the Dutch sides of the border. The report also contains recommendations for improving the existing situation..

The most recent report of this working group, which appeared in 1987, discusses the calibration of current meters (report I-6). It contains the results of an intercalibration exercise which had been organized to determine the influence of the calibration of current meters on the

accuracy of discharge measurements. On the basis of the calibration results, sources of inaccuracy in calibration are analysed and recommendations are made for reducing such inaccuracies.

The working group is presently working on the following:

(1) A study to determine the discharges in the German-Swiss and German-French border areas.

(2) A descriptive inventory of the most important stream-flow gauging stations in the Rhine basin.

(b) A study on how to improve hydrological forecasts by means of a regular exchange of information. A working group named "Forecasts" was created to carry out such a study as the first result of its work, a report on objective, quantitative precipitation forecasts in the Rhine basin was prepared in 1982. A report describing the forecasting models for water level and discharge used in the Rhine basin is in the preparation stages. Another focus of attention for the working group is the elaboration of proposals concerning data- and information-streams for border-crossing forecasts.

(c) A survey of hydrological research basins and representative basins in order to attain a more adequate exchange of results and a better harmonization of studies. As a result of these activities, a catalogue was prepared in 1985 in which all existing and some former hydrological research basins in the Rhine area are described.

(d) Description of extreme hydrological periods, in order to gain a clearer insight into the hydrological phenomena of such a period. A report on the drought of 1976 was prepared in 1983. Studies of the high water of 1983 on the Rhine and the Moselle and of the high water of 1987 on the Rhine are in progress.

(e) An update of the information that was published in the tables part of the monograph. The Commission intends to publish a survey for every decade; the first survey, for the period 1971-1980 is in preparation.

(f) Study of the changes in discharges caused by anthropogenic influences. The study is being prepared by a working group which will first make an inventory of the engineering that have been carried out in the Rhine basin since about 1800. Subsequently, the influences of these works on discharges will be examined.

(g) Research into travel and residence times in the Rhine. The calamity which occurred in 1986 at the SANDOZ chemical plant in Basel has accelerated such a study. A joint working group of the Commission and CIPR/IKSR is attempting to develop better forecasting models for travel times of pollutant waves, including also tracer experiments.

Other items on the CHR research programme are:

- (i) Inventory of dams and water abstraction;
- (ii) Relationship between forest damage and the hydrological regime of the Rhine;
- (iii) Digitization of maps;
- (iv) Survey of hydrological services in the Rhine basin.

Completion of the Manantali Dam

In June, the Organisation pour la Mise en Valeur du fleuve Sénégal (OMVS) invited pre-qualification bids for plant equipment for the 200MW associated hydroelectric station.

The Manantali Dam, 1,500 metres long and 65 m high, was built across the Bafing river, a tributary of the Senegal, primarily to irrigate 376,000 ha of land on both banks downstream and to regulate the extremely variable river flows. Irrigation of at least part of the service area should begin after the dam's completion this year.

In addition to establishing agricultural production in the basin, the OMVS wishes to introduce new crops such as rice, wheat, barley, tomatoes and temperate zone vegetables to replace existing crops such as millet and sorghum.

Manantali will play a key role in this programme. The structure, which is 65 metres high, will create a reservoir of 11,000 M.m³ to provide year round flows and will also supply power for working mineral deposits within a radius of 300 kilometres. Senegal and Mauritania are particularly interested in the irrigation potential; Mali's major concerns are the generation of power and improvements in navigation.

Manantali has been hailed as the last of its kind, given the general move away from major dam construction on the grounds of cost and social and environmental problems.

Book review

Legal and Institutional Factors Affecting the Implementation of the International Drinking Water Supply and Sanitation Decade (United Nations publication, Natural Resources/Water Series No. 23 (ST/TCD/7)).

As a result of the United Nations Water Conference (held at Mar del Plata, Argentina in March 1977) and the recommendations contained in the Mar del Plata Action Plan, the General Assembly launched the International Drinking Water Supply and Sanitation Decade on 30 November 1980. The Decade, 1981-1990, had as its ultimate goal access to clean drinking water supplies and sanitation services for all people by 1990.

The publication discusses the legal and institutional factors which affect the implementation of Decade programmes in Africa, Asia, Latin America and the Caribbean. Some of those factors are set forth below.

A. Organizational, managerial and legal constraints

While there are widespread inadequacies in the provision of drinking water supply and sanitation, rural areas and marginal urban groups are particularly affected by the lack of adequate facilities. Moreover, despite the efforts made in pursuance of the objectives of the IDWSS Decade, the progress in implementing the Mar del Plata Action Plan resulting from the United Nations Water Conference (Argentina, March 1977) has not been significant, if judged against population increases.

There are several substantive factors affecting the sector. Some of them are general socio-economic constraints, such as escalating prices of oil, low economic productivity, high interest rates, debt servicing, population growth, drought and political instability.

In addition, there are constraints which are sector-specific. Developing countries tend to adopt the standards of water supply and sanitation used in more developed areas. Since their economic capability is much lower than that of the models, the uncritical adoption of alien practices may result in overdesign of systems and locking up of scarce capital. A related effect is that the majority of the population do not benefit from high cost, centrally-operated systems. In fact, high connection costs might prevent more widespread use of public systems, since in many cases the average user cannot afford the connection.

Most countries face problems of overlapping jurisdictional powers. Economies of scale, political pressures and comparative managerial advantages tend to favour urban areas, needing complex central networks, to the detriment of rural communities and peri-urban groups.

Water supply and sanitation are basically approached as engineering endeavours. Managerial considerations are usually downgraded, while new construction is favoured. Consequently, agencies tend to favour structural investment to the detriment of operation, maintenance and monitoring. At the same time, excessive reliance on the central government has limited the possibilities and role of local administrations and community participation, while often eliminating the private sector.

Lack of economic data, inadequate cost recovery policies and water tariffs set with political criteria radically affect the financial capabilities of water supply organizations. Thus, agencies tend to rely on subsidies from the Government, rather than to devise and apply demand management procedures and marginal pricing.

Inadequate user participation and lack of public awareness about the role and importance of water programmes add to the constraints on the water supply and sanitation sector.

Marginal weaknesses are also reflected in the inability to limit the user of treated water to household uses, to spread water demands away from peak periods and to prevent the qualitative deterioration of water sources.

The "engineering approach" to water supply and sanitation services gives little emphasis to the role and importance of legal regulations. However, appropriate regulations are essential. A flexible allocation system would permit the transfer of water from irrigation projects to domestic uses, using only a fraction of the capital that would be needed should water be tapped from distant sources and then conveyed to urban centres.

An adequate legal system would also require the assessment of several alternatives, including monitoring, and loss and leak control before commitment to structural solutions, which would probably be more costly. Legal norms on planning would assure that different supply alternatives, with a balance of structural and non-structural measures, would be considered. Finally, appropriate regulations are essential for cost recovery and also for enforced protection of water sources.

The sector also suffers from a general inability to translate policy priorities into plans, and plans into functional assignments to be carried out by implementing and executive bodies.

B. More effective water supply and sanitation services

The provision of water supply and sanitation services requires a judicious balance of technological, organizational, managerial and legal measures. Programmes and projects should be designed according to the economic conditions of the country of implementation. Overdesigned projects and unrealistic water standards should be modified or abandoned, while low-cost multiple-user technologies must be emphasized, promoted and disseminated.

National policies should be spelled out and embodied in national sectoral planning, produced under the direction of a co-ordinating central body. Implementation agencies should follow the criteria and directives laid down by the sectoral plan.

Planning criteria for programmes and project assessment should emphasize the need to consider different alternatives for augmentation of available water supplies. Alternatives should necessarily consider shortage and loss monitoring and control as the most desirable measure, to be disregarded only when new structural investments are proven to be essential.

The organization of water and sanitation agencies should reflect that drinking water supply and sanitation are not purely engineering endeavours, but that they should integrate modern managerial methods. Personnel should be recruited and trained according to this perception.

Sectoral planning and organization of executing agencies must take into account the active participation and support of users. Therefore, agencies should have offices to deal with users and customers. These offices should identify the problem of marginal areas (rural, peri-urban) and special groups (women, children) and advocate their attention. There is also a need for promotion of community ventures and allowance for private entrepreneurs, if appropriate.

Adequate management of agency-user relationships include educational campaigns, participation of local communities and creation of suitable institutional mechanisms. Available alternatives include mutual companies, neighbourhood associations, co-operative societies and user groups. However, participation should not be approached as just a rescue-saving device. Rather, the end result sought is understanding and interaction between the public sector and the community. Thus, it must take place all the way through from planning to operation and maintenance.

Operation and improvement are often neglected. These functions can be improved through appropriate monitoring, rehabilitation and special training.

Adequate operation, maintenance and rehabilitation will reduce investment needs. However, if the sector is to achieve acceptable levels of financial soundness and self-reliance, tariffs should be based to the extent possible on marginal pricing. A sound tariff system demands adequate collection, processing and interpretation of economic data, needs and coverage requirements. National policies might resort to the use of cross-subsidies, transferring resources among profitable and non-profitable areas. In fact, some of the countries that achieved relatively higher standards in the past relied on such a system. However, subsidies from within or outside the sector should be explicit and identified.

Legal rules should be precise, flexible, and objective-oriented. They should satisfy a set of minimal standards including: enforcement vis-à-vis public and private users, agencies, and corporations; prescription of basic planning requirements, including the consideration of non-structural alternatives such as reallocation of water rights, leakage and loss control programmes, and adequate operation, maintenance and rehabilitation; strict enforcement of sanctions and penalties, including those aimed at the protection of sources of supply; and adequate collection and updating of tariffs in arrears.

Properly designed education campaigns are the most cost-effective alternative for improving drinking water supply and sanitation programmes.

Call for news items and participation in information exchange

In view of the scope and purpose of the Newsletter, the editor would like to encourage all those who are in a position to do so to contribute

to the information exchange exercise with news items or documents. To date the response has been encouraging, and it is hoped that a growing network of interested readers will be willing to take an active part in the exercise.

Notes

1/ International Rivers and Lakes, No. 5, June 1985, p. 6.

2/ The New York Times, 19 January 1988, section D, p. 1

3/ Environmental Policy and Law, vol. 17, July 1987, No. 3-4, pp. 175-176.

4/ See article 25 of the Draft Charter on Ground-Water Management, contained in document ENVWA/R.3, which was prepared for a meeting of Senior Advisers to ECE Governments on Environmental and Water Problems, 24 December 1987.