

TRANSBOUNDARY WATER CONFLICTS AND
ALTERNATIVE DISPUTE RESOLUTION

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Abstract

The paper attempts to relate the importance of shared international waters and water-related controversies. Four parts exemplify the argument as to the nature, extent and mechanisms for resolving conflicts associated with transboundary water interdependencies. First, water is viewed as a complex geopolitical challenge and part of an increasingly turbulent, complex and interdependent world. Second, the centrality of hydrodiplomacy is analyzed in terms of multinational river basins and of attempts toward sustainable development. At the same time, the series of environmental threats to security is examined in the context of obstacles and incentives for regional cooperation. Third, the question of conflict and cooperation is viewed as part of efforts toward wider community mobilization and the need for building institutions for effective international protection. Finally, negotiation, arbitration and mediation are part of the wide gamut of Alternative Dispute Resolution techniques and mechanisms for successful conflict management.

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1.0 WATER AND GEOPOLITICAL CHALLENGES

A large and fast increasing literature has explored all over the world the plight of adequate and safe water, the inability for sustained implementation of water resources plans, as well as the continuous efforts to introduce and apply systematic, interdisciplinary approaches. The litany of repeated failures is quite impressive and the criticisms of as to the need for cogent, farsighted water resources planning and management abundant. The counter-intuitive character of human action has also been repeatedly noticed as well as the range of far-reaching ecological, social, economic, etc. impacts and consequences.

At the same time, there has been quite a clamor for international cooperation and macro-engineering schemes such as in the Senegal, Mekong, Indus, Niger, the Nile and other international river basins. But as many authors have repeatedly pointed out, international river basins' institutions have largely proven unsatisfactory. Beyond broad legal imperatives and implicit or expressed political will for cooperation, the practice has been predominantly one of no authority, of rare meetings of interested and/or affected parties, unwillingness to pay, little or no information exchanged, etc.

The last 20 to 30 years are characterized by significant changes in the planning, design, and management of water resources all over the planet. Mounting concerns about the environmental impacts of human activities, potential climatic shifts, expanding populations and demands as well as new knowledge are all expressions of the pressing need to develop also alternative institutional schemes for managing in an integrated manner scarce natural resources. Many nations and regions have increasingly been turning attention to both streamlining existing administrative mechanisms and to introducing innovative institutional arrangements with regard to quantitative and qualitative aspects of their water resources. In outlining international conceptual, methodological and administrative developments particular emphasis is placed on the need for integrated impact assessment, and for the mobilization of resources, personnel, and facilities, in the utilization of lessons learned as well as in incorporating new or emerging professional practices and technological innovations. At the end, the political significance of water becomes most important not only because of its scarcity in densely populated regions, but also because of its sharing across national boundaries.

In this context, geometrically expanded populations and increasing agricultural and industrial activities indicate the possibility of critical, global water shortages in the near future. Even more, large scale population dislocations, socio-economic changes, and national and international events and upheavals have coalesced into an underlying apprehension and have focused attention to the need for more integrated, anticipatory and far-reaching water policies and strategies. In both the popular mind as well as in significant parts of the professional community there seems to be an increasing recognition that even the former relative stability of climate tends to disappear. Indeed, weather oscillations have increased the concern as to present and future impacts of long-term climatic changes on the surrounding environment.

Experts disagree about how much water is available in given regions. However,

awareness is growing that nations must cooperatively manage, engineer, and conserve available water resources. Indeed, as Gleick points out, no region of the world with shared international water is exempt from water-related controversies, though the most serious problems occur in water-scarce regions. Without cooperative management a zero-sum competition will emerge over water. Seasonal and regional water shortages may exacerbate social tensions and precipitate violence. Sharing and cooperation can provide benefits that exceed those achieved by attempts to maximize individual and national self-interest. However, such cooperation requires a new "diplomacy", alternative institutional arrangements, large financial resources, and effective adjudication or conflict management mechanisms.

Numerous scholars have noted that attempts to manage and control water supplies have led to increased human cooperation. Wittfogel (1976), in developing his theories of the rise and fall of hydraulic civilizations, asserts that large-scale hydraulic works were needed for agrarian societies to adapt to dry environments. Hydraulic works brought about new schemes of authority. Hourani (1991) notes how closely linked were the use and development of water resources to the expansion of Islam. He writes that "to bring water to the inhabitants of the cities was an act of sound policy, and irrigation of the land was a practice which spread with the expansion of the Arabs in the Mediterranean."

Today, for example, the major watercourses of the Middle East are increasingly becoming the focus of concern between neighboring countries. Increasing utilization of surface and underground water resources has raised awareness of their finite nature. Only continuous communication between the states concerned can be the central mechanism to peaceful solutions of festering disputes over shared waters. Indeed, the Center for Strategic and International Studies predicted in 1988 that "by the year 2000 water, not oil, will be the dominant resource issue of the Middle East." As population grows and water uses multiply, the supply remains relatively constant, and the sources are often far from the ever-growing centers of demand. Yet, water resources management is not a simple matter of identifying reservoir sites, pipelines, agricultural irrigation schemes, and groundwater pumping. In the Middle East, religion, culture, politics and tradition greatly complicate what at best would be a difficult multinational resource-management problem. Some experts indicate that time is running short, that disaster vis-a-vis Middle eastern sources of water is around the corner. Others maintain that there is no general problem because nations simply can reallocate water from irrigated agriculture to municipal and industrial uses and utilize more efficient water technologies. But abandoning agriculture in order to conserve water has limits set by attitudes and ideology. Beyond the quantity of water, and the use of that water, is also the question of water quality. Deteriorating water quality may in effect be the trend that brings the Middle East to the limits of water availability.

Thus, a series of trends and developments are creating an air of imminent crisis regarding water supplies. Factors underlying this context of urgency include:

- a) the high variance of water supply in many parts of the planet, resulting in dramatic fluctuations, exacerbated by periodic droughts;

- b) rapid population growth, coupled by dramatic shifts from rural to urban areas, the rise of major metropolitan agglomerations and significantly increasing urban water demands;
- c) expanding agricultural uses and intensive irrigation developments;
- d) deterioration of water quality, both the result of agricultural practices (irrigation, pesticides, fertilizers, herbicides) and of urban and industrial uses;
- e) decreasing groundwater availability coupled with contamination of a large number of aquifers;
- f) increasing environmental concerns and ecosystemic considerations, including questions of wetlands, migratory birds, concerns with potential climatic anomalies, the possibility of global warming and the entire gamut of anthropogenic disturbances in the surrounding environment;
- g) transfrontier water dependencies and the international nature of water supplies. As Kolars (1991), for example, has pointed out, over 50 percent of the populations of the Middle East depend upon water from rivers that cross an international boundary.

There is no need to repeat the context of competing and conflicting demands all over the planet. What is particularly noticeable in many examples of transboundary water dependencies is that countries can come close to the brink of war over water schemes (e.g. between Hungary and Slovakia regarding the Gabčíkovo, Nagymaros dams) for which no substantial, detailed impact assessments have been made (Rose 1993).

But what has further complicated the search for thoughtful, coordinated and long-range solutions has been the fact of rapid social changes, of challenges to centralized power, and of the realignment of ideological camps in kaleidoscopic combinations of resource policies, environmental awareness, developmental alternatives and increased pace of technological developments. The sources of these rapid changes can be tracked to fundamental shifts in values, to morphological changes in the structure and functioning of many societies, and to such notable exogenous changes as climatic anomalies and socio-economic interdependencies. Further aggravating the nature and rate of all such transformations are also the confluence of popular and scientific interest in environmental protection; data and information explosion; new understandings as to the structure and functioning of environmental systems; new institutional mechanisms for education and training and for the dissemination of knowledge; increased emphasis on globalization and interdependence; and, profound questions as to development and environment, especially as exemplified in North-South differentiations. The end result of all such considerations can be summarized in three interrelated Cs: complexity (if not complexification) or an entwining process of causes and effects resulting in the near inability to cope with any problems at all; conflict and the presence of increasing numbers of competing stakeholder groups and constituencies; and control or the need to cope with and adjust to complexity,

interdependence, turbulence, uncertainty and large systems' vulnerability.

Recent history, rapid socio-economic changes and the transitions necessitated by the turbulent decades of the 80s and 90s underscore the increasing emphasis on the variety of environmental challenges, the search for sustainable development, the promotion of integrated planning and management, and the attempt to combine structural and non-structural solutions to persistent water resources problems. If we were to summarize four broad areas of on-going transformations in water resources, we should emphasize: a) conceptual breakthroughs, including shifting paradigms in terms of ecosystems, sustainability, heterarchization, complexity, uncertainty, turbulence and interdependence of surrounding environments; b) methodological advances, especially multi-purpose/multi-objective approaches, Decision Support Systems, Risk Analysis, and the implications of rapidly expanding computational prowess; c) organizational mobilization, in terms of new administrative mechanisms, institutional arrangements, renewed interest on river basin interdependencies, contingency planning, Alternative Dispute Resolutions, etc.; and, d) contextual changes, signifying the entire gamut of on-going and future quantity and quality problems, new areas of concern, shifting priorities, potential intervention mechanisms, etc.

By now it should be apparent that the themes of interdependence, globalization, ecosystemic unity and sustainable development throw new light to traditional understandings of the geopolitical nature of water. River basins can, then, become an expression of "transnational regimes" in environmental politics (from global to bilateral scales). Such regimes can be defined either as a set of norms, rules, or decision-making procedures that produce some convergence in the actors' expectations in water related issues; or, as explicit rules specified in multilateral legal instruments regulating national actions (such as conventions or protocols). The geopolitical nature of water rests on a combination of geography and technology and result not only in variegated historical and cultural paths for various nations, but also in intricate ecological adaptations and capabilities marking manifestations of power and command over resources. The depletion of national water resources, recurring droughts, expanding socio-economic demands have fueled confrontations and have forced international exchanges and cooperation. From the 805 AD deed of Charlemagne to a monastery for the navigation of the Rhine more than 3800 unilateral, bilateral, or multi-lateral declarations or conventions on water have been identified with 286 actual treaties of which 61 refer to 200 international river basins (Sironneau, 1993).

Looking back at the historical experience of such efforts, it has been noted that the obstacles erected in the way of the efficient harnessing of these resources by the political boundaries that cut across them have often proved very difficult to surmount (Godana, 1985). But, recently, there has been not only increased awareness but also noticeable agreement among many States that the interconnection of water resources and the interdependence of developmental interests can be best affected by a commitment to principles of cooperation, effective international law, and a wide range of complimentary mechanisms of conflict management and consensus building.

The geopolitical significance of water is further accentuated by the variety of the conditions outlined above and especially by its scarcity, maldistribution and misuse. The

mismatch between political boundaries and natural river basins, becomes, then, a focal point for the variety of difficulties reported in the literature vis-a-vis joint planning, allocation of costs, advantages of scale, exercise of power and coordination, and the whole range of issues associated with integrated, holistic management. Cooperation and conflict are, then, expressions of the same quest for improving effective planning and management, for promoting new ways for sustainable development, and for accommodating the realities of geography to the social context of shared water resources. Such international responsibilities tend to fall into three general categories. First, the "downstream responsibilities" of the water of one state which flows into another. Second, the "upstream responsibilities" of states whose activities may extend upstream and affect another state. And, finally, "cross-stream responsibilities" of countries whose common border is formed by a river, or even when they share underground reserves (Rose 1993).

2.0 ON HYDRODIPLOMACY

As indicated throughout the previous pages, demands for water are expected to expand as a result of both continued economic development and population growth. At the same time, broad questions of environmental preservation will persist and allocation patterns especially of shared water resources will continue being demanding and controversial. Present water management arrangements are not well equipped to deal with the new planning spaces. The practices which have evolved during the development to the present stage are no longer adequate to meet the demands of a larger framework for socioeconomic development as well as environmental accountability.

The comprehensiveness of water resource planning has been the subject of controversy and debate in the literature. It has been recognized, however, that in order to be able to maximize the benefits from any water resource project a much larger systemic analysis of the surrounding environment is needed, a broadening of the traditionally narrow planning and management approaches, and an increased sensitivity to decision-making problems associated with multi-objective and multi-purpose actions. In this vein a recent publication of the World Bank (1993) has elaborated the need for a comprehensive framework for analyzing policies and options where water scarcities exist, inefficiencies persist and environmental damages are becoming apparent. In such a context analyses at a river basin level become part of a national strategy for water resource management that includes elements for formulating public policies, regulations, incentives, public investment plans and environmental protection (as well as the interlinkages among them).

Geography suggests that, by virtue of physical unity and regardless of political divisions, a river basin should be developed and managed as a single indivisible whole. This is because moving water ties land together and interference with its movement has repercussions elsewhere in the basin. While geographic ties prescribe the unitary development of river basins, politics and history distort this process. The nation-state covets its sovereignty. Moreover, the desire to maximize benefits for itself provides the nation state with a powerful incentive to exploit resources unilaterally. This myopic behavior can generate international frictions, conflicts, and war. We are, therefore, faced with a situation in which states, confronted with sub-optimal choices tend to adopt a non-cooperative stance,

although cooperation, on specific issues, would be in their mutual interest.

As Mandel (1991) has pointed out, the sources of dispute over international river basins encompasses such diverse disciplines as ecology, economics, social psychology, religion, cultural anthropology, engineering, hydrology, and geopolitics. The author suggests a three-stage explanatory process starting from a non-cooperative setting (with pre-existing general antagonism); to a stage of environmental imbalance encompassing perceived growing scarcity of usable water and inequalities in distribution; to, finally, power asymmetries among riparian nations and little reciprocal interdependence.

The creation of a water management "regime" may facilitate the emergence of mutually beneficial agreements among the local or regional actors, ensuring that friction does not lead to conflict. An everyday definition of a regime is a "mode or system of rule or government." In contemporary international relations theory, however, regimes consist of procedural and normative guides to state behavior. Areas in which international regimes have grown most recently include outer space, the oceans, telecommunications, trade commodities, etc. Various types of international regimes have existed for centuries in such areas as the law of the sea, monetary affairs, trade, and communications. But the technological, political and economic forces which have brought nations into these more recent "webs of interdependence" have extended deeper than ever before into provinces that once had been the exclusive jurisdiction of national governmental policies.

Indeed, in the last fifty years, national interests to divert and develop international water resources, use the resources as a conduit for waste disposal and assimilation, and to preserve certain environmental amenities beyond the historical uses of international rivers have given rise to new international agreements. These agreements reflect an interest to engage in comprehensive national planning, basin-wide management, and multi-sectoral development and water quality control. Thus, among professionals, the discussion of water resources' management has moved from a focus on efficiency, through multi-purpose planning, to comprehensive management, coupled with the increasing concern for ecosystem maintenance. This movement has fostered an increased need for interdisciplinary management and the search for sustainable development along natural boundaries rather than artificial administrative divisions.

In order to be able to develop integrated management mechanisms for dealing with questions or implementing shared water resources policies, the existing literature emphasizes that there is a need for organizations that:

- a) are sufficiently comprehensive to encompass the problems under attack;
- b) facilitate coordination of all related efforts;
- c) are adaptable to the dynamics of environmental change and to progressive stages in the solution of environmental problems (operational flexibility); and,
- d) are capable of obtaining, evaluating and applying the appropriate science and

technologies to a variety of resource problems.

At the same time, as Susskind (1994) notes, the task of generating international agreement on anything is extremely difficult. The procedures currently used to formulate global agreements were not designed for complex ecosystemic and environmental problems, negotiators need to have unique interdisciplinary and technical skills, linkages among environmental concerns and other policy issues must be adequately established, and, effective monitoring and enforcement arrangements must also be devised and properly implemented. In such a demanding task Susskind ends with the pessimistic note as to the serious obstacles to global cooperation, including the increasing split between the developed nations of the North and the developing nations of the South; the persistence of national sovereignty; and the lack of incentives sufficient to bring nations to the table for serious and sustained negotiations.

In the same vein LeMarquand cites five important policy factors which influence a country's position about international rivers, namely: image, or the perception of national posture in foreign policy; international law, or the legal principles that enable countries to get involved in negotiations; linkage to other bilateral or multilateral issues; reciprocity and the desire for mutual commitment and obligation; and, sovereignty and the perception of loss of control over domestic resources implied by collective or bilateral constraints. The last is again part of a skepticism about the suitability of the state system with the search for a "rational" environmental management and with the desire for coping with endangered-planet problems. This question was particularly raised in the case of Antarctica as to whether an existing international system, dominated by sovereign states and influenced by multinational corporations, international blocs, and non-governmental scientific and political groups, can respond adequately to increasing environmental challenges.

Water resources management is continuously changing. Changes in values, morphological transformations, and external shifts (such as climatic anomalies and interdependence) have created a context of high complexity, globalization, turbulence and uncertainty. There is, therefore, the need for coping with, and adjusting to such rapid changes as well as understanding conceptual, methodological and institutional shifts. Poorly conceived and poorly executed projects, unstable management and facilities, inability to adapt to changing conditions of supply or demand, and failure to take into account environmental and social considerations have all contributed to unsustainable development, a process that has systematically discounted the future. Thus, there is a need for the development of appropriate technologies and management practices which facilitate the survival of water projects in a demanding global context, assure the control of a variety of impacts on water resources, help conserve resources and rehabilitate disturbed habitats, and provide for a sustainable use of soil and water resources.

What are, then, the pragmatic responses and incentives for proposed normative planning (goals and objectives), integrated management (systemic administration) and conflict resolution (the mediation and management of conflicts)? Here, again, existing and expanding literature in the above three areas is discussing and articulating such notions as flexibility, "rolling plans," contingency principles, heterarchization and networking, participatory and

anticipatory orientations, and the overarching need for proactive schemes or risk management.

There are currently a variety of multi-institutional approaches ranging from local institutions involving riverine institutions, national and international NGOs and research institutions, private sector participants (especially construction firms), bilateral and multi-lateral donors, riparian government institutions, all the way to transnational river basins (Scudder 1993). All such multiple actors and institutions face problems of vertical and horizontal integration not only in water resources projects, programs and policies; but, also, within and between other resource management entities and local, national, regional, and international organizations. These are principles from international law and their letter and spirit derive from bilateral and multilateral treaties, binding acts of international organizations, rules of customary international law, and, judgments of international courts and tribunals. All such components, provide for some general principles and rules with regard to environmental matters (Sands, 1994). Such principles and rules include sovereignty over natural resources, good neighborliness and international cooperation, the precautionary principle (especially when there is scientific uncertainty), the polluter pays principle, and, the common but differentiated responsibility.

Cross-cutting this complex planning and management plane are also theoretical problems of the legal doctrines governing the utilization by States of shared water resources. The four doctrines and theoretical approaches most usually encountered include:

- a) the doctrine of absolute territorial sovereignty (the so-called Harmon doctrine), where a riparian may do what it will with the water;
- b) the doctrine of absolute territorial integrity, regarding uninterrupted downstream flow;
- c) the doctrine of limited territorial sovereignty or equitable utilization, which accords recognition to a riparian's jurisdiction, but, at the same time, ensures downstream states a reasonable share of water in reasonable condition; and
- d) the doctrine of community co-riparian states, community of interests in the water or, integrated drainage basin development transcending national boundaries.

River basin planning and management has a long-time honored tradition, from the development of the Tennessee Valley Authority, to the Senegal development plans of more recent years. The underlying, common thread in all such efforts has been the development of water resources for a variety of beneficial uses. From such obvious premises, the existing literature has raised the fundamental question as to whether such integrative regional water plans can be fitted within the geographic limits of a whole river basin or watershed. Can such joint planning and management take place in the vast expanses of the Nile, the Amazon, the Parana/LaPlata, or should it be restricted to more regional, specific socio-political conflicts of rather well-defined geographic, cultural, environmental, physiographic, economic

boundaries? This is why some authors prefer to talk more about "problemsheds" rather than watersheds.

The question of scale, boundary, and geographic planning unit is of central concern for efforts of definition of the problem, identification of parties-at-interest, and implementation mechanisms. While many authors recognize the theoretical advantages of comprehensiveness, integration, and unified planning and management, successful practices seem to lag behind. The problems in implementation have been outlined above but it is important to recall that what we have summarily called as the on-going process of complexification creates a great diversity of interests, differences in resources accessibility, complex organizational arrangements, and competing and conflicting water policies. Finally, diachronic considerations complicate matters further by shifting over time of goals and preferences, priorities, political consensus, leadership, sponsors, prices, etc.

What are the implications of such an emphasis (process rather than product)? First, we need to recognize the difficulties associated with formal, legalistic approaches which tend to emphasize predominantly conduct rather than reasonable management (especially where there is no agreed upon river regime). Second, the existing legal approaches (necessary for conduct and enforcement) can be supplemented by such flexible mechanisms as:

- second track diplomacy (environmental diplomacy or hydrodiplomacy).
- Alternative Dispute Resolution through international bodies or in the spirit of Agenda 21.
- technical/professional or independent panels of experts or what have been called epistemic communities.
- public awareness, participation and mobilization.

The operational terms for the above international law and other mechanisms are complimentary and implementation. In existing multilateral agencies there seems to be three vexing problems here. One has to do with the historical and cultural inertia of past differences and practices. The second, with the calculation of all costs involved in shared waters' development. And, the third, with the incorporation of social and environmental concerns into planning. These broad problems emphasize once again the need for negotiation, for third party expertise and for dialogue based on factual information.

There is obviously a vast array of concerns and elements in comprehensive, integrated or holistic approaches. Within the general context in which resource policies and decisions exist, authors such as Mitchell suggest five key leverage points -- legitimization, functions, structures, processes and mechanisms, organizational culture and participant attitudes. Suffice it to say that while there is substantial agreement that it is desirable to use an integrated approach, there is no one instrument, mechanisms, or approach that can expedite integration. Complimentarily and a continuous process of commitment to dialogue run through any discussion of successful shared water management efforts.

The resultant adaptive planning and management process outlined above is reinforced by the need to build an iterative process that can avoid obsolescence upon implementation and carry on continuous sensitivity analysis for changing socio-economic circumstances and shifting or new goals and objectives. The improvement of technical and organizational competencies should be coupled with education and public awareness as to the wise use of water resources for the future of any nation.

All such incentives (and other broader attempts for institutional changes outlined previously) rely on increased efficiency and financial discipline; better organizational effectiveness; and, social equity in terms of larger goals for fair access of water resources to all populations. The agreements which have emerged from efforts of "hydrodiplomacy" reflect, in great part, the desire of the signatories to engage in comprehensive national planning, basin-wide management, multi-purpose development, and water quality control. As such, they constitute (a) tangible evidence of an increasing concern with the need to craft flexible but durable regimes capable of enhancing the protection of the ecosystem, and, more generally, (b) a desire to serve the interests of all parties involved by reducing uncertainty, stabilizing expectations, and promoting the "routinization" of conflict resolution or conflict management.

Yet, as Lynton Caldwell has also noted, there exists a notable paradox of international environmental cooperation, since national governments are characteristically reluctant to initiate cooperative efforts in this area. In essence, national political leaders are not that much interested in pursuing international environmental cooperation unless their own national (and often personal) interests are involved (Caldwell 1988). Plainly, internal, local issues tend to drive international decisions. The reasons that persuade governments to negotiate international environmental agreements and to make formal commitments to cooperate are not necessarily those that determine whether, how, or when governments will act.

But while these reservations should alert us as to the difficulties involved in managing shared water resources current national water policies and developmental plans, international organizations, joint planning/harmonization efforts, peace talks, monitoring on a continuous basis, conducting scientific studies, cooperation and exchanges are all parts of a supportive scene of "sharing" and of the spirit of integrated, holistic, unified planning and management. This spirit is also emphasized in such notable efforts as the Israel-Jordan Peace Treaty (Article 6 and Annex II), or the establishment of a joint Commission between Portugal and Spain to coordinate distribution of Iberian waters.

3.0 CONSENSUS BUILDING AND CONFLICT MANAGEMENT

Two terms that are often encountered are "settlement of disputes" and "conflict resolution." The first usually connotes a more or less permanent institutional machinery for formal settling of disputes and of ironing out differences. The second can be more conveniently used for more informal ways of managing disagreements and for avoiding or minimizing conflict escalation. The principles of international law, i.e., equitable utilization, prevention of significant harm to other states, obligation to notify and inform, obligation to share data, cooperative management of international rivers, obligation to resolve disputes

peacefully, as well as formal treaties become the instruments for settling disputes and disagreements.

As many authors have repeatedly pointed out, there is a long history of water-related disputes from conflicts over access to adequate water supplies to intentional attacks on water systems during wars (Gleick 1993). As stated previously, such conflicts, tensions and frictions are expected to increase as growing populations, urbanization and economic development will require more water for agricultural, municipal and industrial uses. At the same time, water availability may be coming up against what Falkenmark has labelled as the "water barrier," namely a level of supply below which serious constraints to development will arise (quoted in Gleick, 1993). Such limits will be further stretched by potential climatic anomalies which in turn could intensify regional conflicts between water-rich and water-poor nations.

In discussing water conflicts, we may want to recognize three distinct phases, i.e., conflict creation, conflict management, and conflict resolution. In the first (the genesis of conflicts), the emphasis is on diagnosis, anticipation and prevention, problem architecture, and joint fact-finding. The second phase denotes a stage for the development of confidence and trust through such mechanisms as mediation, arbitration, neutral expert fact-finding, etc. Finally, conflict resolution involves consensus building and depolarizing of conflicting interests through public finding processes or adjudication.

The search for a typology of conflicts and of appropriate responses has led to many speculative thrusts and interesting conceptual schemes. The implication of such attempts is that we should pay more attention to international river basins where the conflict potential is greatest, especially as rivers forming a shared boundary between nations; where human action (e.g., construction of a dam) trigger disruptions; in cases of power asymmetries and non-cooperative settings; and, in cases of noticeable environmental imbalances (as e.g., desertification, drought, water shortages, etc.). It is at this point that writers usually distinguish between "crisis politics" and "routine politics," or between "acute conflicts" (foreign policy, confrontation) and "low politics" (aspects of economic welfare) (See among others Frey, 1993).

International relations have become so complex that alternative dispute resolution means have become important in managing or resolving inter-societal conflicts. The search for alternatives to legal institutions to arbitrate disputes has been prompted not only by saturation of legal mandates, but also by increasing litigation and confrontation. Mediation, as a compromised discussion between disputants aided by a neutral third party whose judgment is respected, has become a viable alternative to adversarial processes. The gamut of adjudication, arbitration, mediation, conciliation and even "principled negotiation", expresses various alternative processes of dispute resolution. But criticisms have also risen as to whether such processes can compensate for inequitable power relations or can provide incentives for compliance or acknowledgement of the third party decision when there is no recourse to legal sanctions.

Supporting these mechanisms is also the role of public participation as an important

means to reach project ends in development activities and in promoting environmental goals. Thus, in order to promote an effective and equitable implementation of an iterative process of management there is a need to accentuate the use of public involvement and participation as an important means for increasing awareness of and engagement with water resources planning as a way of minimizing conflict. Public involvement can vary all the way from simple informing to highly structured means of participatory processes in which the public takes an active part throughout all phases of planning and policy-making. Obviously, there are different degrees of control over the entire process, but the underlying assumption rests on the commitment to seek public input at progressive planning stages. By definition, participative planning is an iterative process beginning with problem identification all the way to evaluation of alternatives and with feedback loops linking publics, planners and decision-makers.

Public participation and negotiation become tools in maximizing agreement when there are disagreements not only as to the nature of the problem but also as to desirability of certain outcomes (goals). More important, "citizen participation," and "public involvement" have become not only the noble cries of an environmentally conscious society, but also the presumed imaginative tools for creative planning and for the achievement of a broad consensus for desired action. The last two decades have brought about not only a revolution in thinking, but also a renewed commitment to participatory decision making and a host of legal mandates for improving the quality of the surrounding environment or for arresting adverse consequences of proposed actions. The degrees of public involvement and commitment range from public information releases to joint planning and decision making through a distinction between public awareness, public involvement and public participation. In other words, a supportive public climate of conflict management, increased consensus, and in international cases a reinforcement of the spirit of "transnational commons." Public awareness implies one-way information and alerting to community issues. Public involvement implies two-way communication and a means of engaging community members in the exchange of information (dialogue). Finally, public participation is the most intense form of interaction between authorities, experts and citizens and implies more than anything else truly joint planning and democratic delegation of power and shared leadership.

But there is an apparent dilemma in all such recent developments of participatory decision making and conflict management. As it has been noted within the last decade or so, societies have tended to advocate the simultaneous growth of participatory democracy and of expertise in decision making. It becomes difficult to maximize both of these value preferences and strains appear between the idealized conceptions of citizen participation and the harsh demands of public policy making and implementation, especially when they entail transfrontier considerations. Again, as many authors on the topic have also observed, participation is a double edged sword: planners and decision makers must be open to working with citizens, and citizens must be active and competent in planning. The basic proposition remains, however, namely that the broader the base of citizen participation, the more the potential influence resource managers and citizens can bring to bear on public policies and plans and the easier it can be to create a transnational climate of trust in transfrontier water dependencies.

4.0 WHAT ADR IMPLIES

Levi in his seminal work Contemporary International Law has succinctly observed that international disputes are nowhere defined in conventions or treaties. But when an international dispute is found to exist states are obliged to settle it by peaceful means in such a manner that international peace and security and justice are not threatened (Levi, 1994). Some states have their own institutions for the settlement of regional disputes (as e.g. the European Union), while other international agencies have specialized procedures. There are a multitude of international organizations and agencies within which disputes can be settled peacefully. Other Accords (such as the Helsinki Accord of 1975) refer directly to disputes among participating states, while the U.N. Convention on the Law of the Sea (1982) foresees the creation of an international tribunal.

There are quite a number of methods available to disputing parties, but no standard legal structure for proceeding. Important here is the entire gamut of voluntary methods of no legally binding nature, but representing the wish to settle disputes without decisions by third parties (e.g. negotiation, mediation, enquiry, and conciliation). In other cases, third parties can through arbitration or adjudication help diffuse and settle conflicts. All such efforts and similar voluntary mechanisms for helping settle conflicts form the backdrop for the practice of Alternative Dispute Resolution.

Considerable evidence for the practice of ADR from many parts of the earth creates a basis for some realistic optimism (Gray 1993). Theoretically, collaboration for addressing a wide range of environmental disputes involves three phases, i.e., problem setting (problem definition or problem architecture), direction setting (predominantly negotiations over substantive problems), and implementation (systematic management of inter-organizational relations and monitoring of agreements). All alternative processes proposed (direct negotiations, good offices, mediation, conciliation, etc.) could allow the parties to reach a faster, more timely, and hopefully, more appropriate resolution of disputes.

In this context, one can observe in on-going management practices the convergence of formal international legal practices, alternative dispute resolution methods, and innovative water institutions. The search for comprehensive approaches is calling for more integrated water resources management across boundaries, jurisdictions and uses. Furthermore, cross-boundary, comprehensive, integrated river basin approaches become more feasible when international institutions can serve as magnifiers of public pressure and as sounding boards in competitive politics (as was the case in the Baltic and North Sea ministerial meeting and successive ozone talks after 1987 -- Haas et al. 1993); as springboards for the creation of what the same author has labelled "epistemic communities," i.e., experts in environmental issues sharing principled values regarding the enhancement of collective welfare; as enhancers of a contextual framework for credible commitments among states; and as vehicles for building national capacity through inter-organizational networks and transferring of water relevant information. Such catalytic functions can help promote a more global approach and strengthen any relevant effort for integrated water resources management.

Although analytical techniques alone are not sufficient for building better water

allocation agreements or managing conflicts, they will have to be brought into any integrated water management considerations. The following include some of the more important lessons learned from the water resources field and experiences in negotiating international environmental regimes:

1. Integrated management across water uses and jurisdictional boundaries is the key to sustainability.
2. Water development and management must move from a project-by-project focus to programmatic planning and systems management. The use of the river basin as a unit of regional planning is reemerging as a focal point.
3. A variety of institutional models for managing and developing water resources are available. These range from authorities and bilateral agreements to multilateral compacts to river basin and regional authorities.
4. Data are rarely neutral. Data collection itself is driven by values and is ultimately negotiable.
5. Technical expertise is necessary, but not sufficient, for achieving integrated water management -- so too with political agreements. The critical water management skills and institutional arrangements increasingly are those designed to facilitate management in the gray area between the political and technical design and operation.
6. Changing demographics in both arid and humid areas are requiring new agreements or institutions to reapportion old allocations and facilitate negotiations on new apportionments through relevant compacts.
7. Assisted negotiation approaches such as mediation by a third, neutral party are proving useful to meet such needs.
8. The key conditions for successful water sharing remain those of equity of any agreement and of successful control by affected parties of their own water resources.

In a recent article discussing Middle East negotiations Aaron Wolf (1993) has also proposed a series of specific guidelines and cautions for efforts in facilitating shared water negotiations. These include:

- identification of the actors, salience of interests and power;
- insistence on common criteria for analysis;
- inventing options for mutual gains and equitable division of existing resources;

- determination of feedback mechanisms for perpetuating agreement.

The common thread in any discussion of transboundary water conflicts emphasizes how new strategies are needed because water (and for that matter natural) resources problems are becoming both highly complex and globalized. Some even argue that the traditional spatial environmental envelope has collapsed and project boundaries - and their impacts and consequences - are now much more diffuse. Thus, there is a need for bringing back an environmental approach that requires drastic measures of ecological rehabilitation, innovative institutional mechanisms, and a balance between autonomy and cooperation. Such global approaches entail also improvement of environmental monitoring and information by expanding the factual basis of comprehensive river basin models. In addition, they also imply a framework for negotiations which stresses the importance of comprehensive institutional formats and clarity in national and international decision making processes.

Given such considerations and strong socio-political divisions (even centrifugal forces and fragmentations in many nations) there are three responses that we should consider. First improve efforts towards the utilization of "hydrodiplomacy" in terms of understanding alternative dispute resolution and conflict management efforts to transboundary water resources. Second, recognize again the river basin approach as a cooperative mechanism and authority, and as being much more sensitive to ecosystemic interdependencies. And, third, place particular emphasis on integrated water resources management (including the building of more robust water resources institutions).

As the international scene turns to questions of sustainable development, the restoration and rehabilitation of degraded environments, and to the creation of new cooperative arrangements centering around shared water resources, it becomes apparent that institution building, comprehensive management and alternative dispute resolution efforts will be central quests in the years to come. Diminishing or degraded water resources and their potential impacts on international security, provide unique opportunities for cooperative institutions and for cooperative transnational behavior.

The international conference in Dublin on Water and the Environment (1992) and the UN Conference on Environment and Development (UNCED) in Rio de Janeiro during the same year are but only two recent manifestations of the centrality of water, environment and development. The transition to the 21st century will require also an institutional order of cooperation, of comprehensive management principles, and of sharing of experiences gained in the practice of ecosystemic principles in water resources projects. Paths to effectiveness for some authors imply the boosting of governmental concern; the enhancement of a contractual and bargaining environment, and, finally, the building of national capacity (Levi et al. 1991). Others (e.g. Carbonneau, 1989) discuss larger educational and epistemological goals in ADR and the existing legal system including the building of decentralized alliances, provision of prenegotiation assistance to individual countries, new approaches to treaty drafting, expansion of the role for nongovernmental interests, balancing science and politics, or encouraging issue linkage. The question that should worry us, though, is to what extent sovereign states, multinational corporations, NGOs, or existing international bodies can respond in sharing long acquired power and in implementing action that promotes ecological

interdependence and globality of increasing environmental challenges. At the same time, rapid population increases and expansion of activities are creating unprecedented situations requiring new economic paradigms of planning and action. The main problem will be how to achieve integrated planning and management within institutional frameworks which have evolved under different conditions and for needs which are incongruous with the present and certainly will differ from projected futures.

SELECTED BIBLIOGRAPHY

Amy, Douglas J. 1987. The Politics of Environmental Mediation. New York: Columbia University Press.

Benedick, Richard Elliot. 1991. Ozone Diplomacy: New Directions in Safeguarding the Planet. Cambridge, Mass: Harvard University Press.

Bingham, Gail. 1986. Resolving Environmental Disputes: A Decade of Experience. Washington, DC: The Conservation Foundation.

Birnie, Patricia W., and A.E. Boyle. 1992. International Law and the Environment. Oxford: Clarendon Press.

Caldwell, Lynton K. 1988. "Beyond Environmental Diplomacy: The changing institutional structure of international cooperation" in John E. Carroll (ed.) International Environmental Diplomacy. Cambridge: Cambridge University Press.

Carbonneau, Thomas E. 1989. Alternative Dispute Resolution. Urbana: University of Illinois Press.

Carroll, John E. 1983. Environmental Diplomacy: An examination and a prospective of Canadian-U.S. transboundary environmental relations. Ann Arbor: The Univ. of Michigan Press.

Chauhan, D.R. 1981. Settlement of International Water Law Disputes in International River Basins. Berlin: Erich Schmitt Verlag.

Choucri, Nazl (ed.). 1993. Global Accord: Environmental Challenges and International Responses. Cambridge: The MIT Press.

Creighton, J. Priscoli, J.D., Dunning, C.M. 1983. "Public Involvement Techniques: A Reader of Ten Years Experiences at the Institute of Water Resources." IWR Research Report. U.S. Corps of Engineers, Institute for Water Resources, Ft. Belvoir, VA.

Delli Priscoli, Jerome. 1992. "Collaboration, Participation and Alternative Dispute Resolution (ADR)". Technical Paper Prepared for the World Bank.

Elliott, Michael. 1991. "Water Wars," Geographical Magazine 64(5):28-30.

Falkenmark, Malin, Gunnar Lindh, Lenart De Mare, and Carl Widstrand. 1980. Water and Society: Conflicts in Development. Part 2. Water Conflicts and Research Priorities. Oxford: Pergamon Press.

Frey, Frederick. 1993. "The Political Context of Conflict and Cooperation Over International River Basin" Water International, 18(1):54-68.

Gleick, Peter H. (ed.). 1993. Water in Crisis: A guide to the World's Fresh Water Resources. New York: Oxford University Press.

Gleick, Peter H. 1993. "Water and Conflict: Fresh Water Resources and International Security." International Security 18(1):79-112.

Godana, Bonaya Adhi. 1985. Africa's Shared Water Resources: Legal and Institutional Aspects of the Nile, Niger and Senegal River Systems. London: Frances Pinter Publishers.

Gray, Barbara. 1993. "Negotiating Collaborative Solutions to Disputes Over Water Resources." Paper prepared for the Interamerican Dialogue on Water Management, Miami, October 28-30.

Haas, Peter M. 1990. "Obtaining International Environmental Protection Through Epistemic Consensus." Millennium: Journal of International Studies 19(3):347-363.

Haas, Peter M., et al. (ed.). 1993. Institutions for the Earth: Resources of Effective International Environmental Protection. Cambridge, Mass: The MIT Press.

Hourani, Albert. 1991. A History of the Arab People. Cambridge, Mass.: Belknap/Harvard University Press.

Hurrell, Andrew, and B. Kingsbury (eds.). 1992. The International Politics of the Environment. Oxford: Clarendon Press.

Kolars, John F., and W.A. Mitchell. 1991. The Euphrates River and the Southeast Anatolia Development Project. Carbondale: Southern Illinois University Press.

Lang, Reg. 1986. "Achieving Integration in Resource Planning." In Reg Lang (ed.) Integrated Approaches to Resource Planning and Management. Calgary: The University of Calgary Press.

LeMarquand, David G. 1977. International Rivers: The Politics of Cooperation. Waterloo: University of British Columbia.

Levi, Werner. 1991. Contemporary International Law: A Concise Introduction. Boulder: Westview Press.

Mandel, Robert. 1991. "Sources of International River Basin," Paper presented at the Annual Meeting of the International Studies Assn., Vancouver, BC, March.

McDonald, Adrian, and David Kay. 1988. Water Resources: Issues and strategies. London: Longman Scientific & Technical.

Mitchell, Bruce (ed.). 1990. Integrated Water Management: International experiences and perspectives. London: Belhaven Press.

- Naff, Thomas. 1993. "Water: 'That Peculiar Substance'." Research & Exploration 9:6-17.
- Newson, Malcolm. 1992. Land, Water and Development: River basin systems and their sustainable management. London: Routledge.
- Patchen, Martin. 1988. Resolving Disputes Between Nations: Coercion or Conciliation? Durham: Duke University Press.
- Porter, Gareth, and J.W. Brown. 1991. Global Environmental Politics. Boulder: Westview Press.
- Rogers, Peter. 1991. "International River Basins: Pervasive Unidirectional Externalities." Paper presented at the Conference on "The Economics of Transnational Commons," Universita de Siena, Italy, April 25-27.
- Rose, Laurence. 1993. "Shared Water Resources and Sovereignty in Europe and the Mediterranean." IBRU Boundary and Security Bulletin, 1(3):62-67.
- Saha, Suranjit, and C.J. Barrow (eds.). 1981. River Basin Planning: Theory and Practice. New York: John Wiley and Sons.
- Sands, Philippe (ed.). 1994. Greening International Law. NY: The New Press.
- Schramm, Gunter. 1980. "Integrated River Basin Planning in a Holistic Universe." Natural Resources Journal, 20(4):787-806.
- Sirronneau, Jacques. 1993. "L'Eau Resource Strategique; Menaces et Enjeux de l'hydropolitique." Geopolitique, No. 43(Fall):45-69.
- Susskind, Lawrence E. 1994. Environmental Diplomacy: Negotiating more effective global agreements. NY: Oxford University Press.
- Trolldalen, J.M. 1992. International Environmental Conflict Resolution. Washington, DC: NIDR.
- Westing, Arthur H. (ed.). 1986. Global Resources and International Conflict: Environmental Factors in Strategic Policy and Action. Oxford: Oxford University Press.
- Wittfogel, Karl A. 1957. Oriental Despotism: A Comparative study of total power. New Haven: Yale University Press.
- Wolf, Aaron. 1993. "The Jordan Watershed: Past Attempts at Cooperation and Lessons for the Future." Water International 18:5-17.
- Zarour, Hisham, and Jad Isaac. 1993. "Nature's Apportionment and the Open Market: A promising solution to the Arab-Israeli Water Conflict." Water International, 18(4):40-53.