Towards a typology of water-related conflicts in the urban environment

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Abstract Rapid urban population growth is occurring, particularly in developing countries, and has led to problems of providing adequate water supply and sanitation. Two dominant policy recommendations have been put forward – raise fees to existing users or increase the role of the private sector in the provision of water and sanitation services. A number of civil disturbances and riots have occurred in response to such proposals. More pragmatic policy initiatives are required to prevent and solve water-related conflicts, as well as new institutional structures to better handle competing and conflicting water demands.

Keywords IWRM; rapid urbanization; urban water unrest; water conflicts

The context of urban water systems
Growing cities have been the engines of socio-economic expansion, vital centres of human creativity and the requisite infrastructure for both survival and development. Cities owe also their early existence and development to available good quality water. But their fast growth, contaminants released by their large populations, and assorted industrial activities have created new problems of both quantity and quality. Urban pressures on water and sanitation are results of increased water demands and of overload on water resources, improper waste disposal, contamination of streams and rivers, unwise extraction of water from diminishing aquifers, and last, but not least, of inefficient service management and of the absence of appropriate institutional support.

Rapid population growth and sprawling urbanization contribute to increasing societal complexity and interdependence; increasing magnitude of effects on the surrounding environment, in terms of intensity, severity and duration; fundamental questions as to the distribution of effects to various segments of population; and to the demand to cope in a flexible and responsive manner to both short and long-term problems of rapid urbanization. At the same time, the rise of metropolitan and megalopolitan agglomerations give rise to renewed concern as to the control of the natural metabolism of infrastructure networks, as to the rising demands for public services and facilities; as to new institutional arrangements of efficient and equitable water supplies; and as to the search for comprehensive management that also incorporates public involvement and participation. For the last, urban progress does not automatically follow advances in technology or systematic planning. It is equally based on the will of a community to understand, accept and manage the forces of change.

The concentration of population in large cities of 1 million or more is increasingly associated with developing countries. There were an estimated 292 such “million-plus” cities in LDCs in 2000. Megacities and megalopolitan conurbations with 10 million or more residents are also becoming more numerous and are to be found predominantly in developing countries. Dhaka, for example, is expected to add about 9 million people between 2000 and 2015 while New York will expand in the same period by about 800,000 residents In most developing countries, cities are growing between two to three times faster than their national population.

The unprecedented magnitude of urban growth has added fuel to long-standing debates
about overpopulation and carrying capacity, by extending the concern as to both the livability in such large urban concentrations, and as to the capability to govern and provide good urban management. The basic characteristics of on-going demographic changes and projected population transformations point out that urban areas of less developed countries will incur almost all of the world’s population growth. Urban areas of more developed countries will experience population aging, centrifugal movement to the periphery and immigration. All such trends will impose, especially in LDCs, more pressure on the space infrastructure and resources of the cities, with heavy demands for already inadequate housing, growth of squatter settlements, and persistent problems with running water and water disposal. Even in cases of economic development, manufacturing plants move to increasingly distant places (e.g. in Mexico City and Sao Paulo) with the potential for further geographical dispersion, encroachment of agricultural land, and the need for elongated and expensive urban water services.

Recent trends of urbanization reflect both long-rooted as well as recent economic and socio-political changes. In presenting urban trends and developments, especially high population growth and the rise of “world cities”, we must consider what both rapidity of change and increasing complexity imply for managing aspects of water supply, wastewater, and stormwater systems. Increased size, density and heterogeneity of population in sprawling megacities, not only escalate investment costs of spatially diffused entities, but, also, reinforce cumulative and interactive effects of interrelated aspects of urbanization, comprehensive land use planning, and differences in composition of population. In essence, the megacities in developing countries create conflicts between water uses and users and exemplify the need to develop new conflict management approaches to complex problems of water scarcity, of quality, as well as forward-looking water planning and management efforts in envisaged sustainable cities.

A common thread in any discussion of sustainable urban water development emphasizes how new strategies are needed because water (and for that matter natural) resources problems are becoming highly complex and globalized. Some even argue that the traditional spatial environmental envelope has collapsed and water system boundaries – and their impacts and consequences – are now much more diffuse. Thus, there is a need for bringing forward an environmental approach that requires drastic measures of ecological rehabilitation, innovative institutional mechanisms, addressing the central problem of poverty for increasing segments of population, 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 water resources models. In addition, they also imply a framework for negotiations among expanding numbers of parties-at-interest and of relevant stakeholders of diversified and heterogeneous urban populations.

For the urban water manager it becomes obvious that we are facing an almost paradoxical combination of growth and decay. On the one hand, we are facing on an unprecedented global scale centrifugal forces of rapid, haphazard metropolitan growth. On the other, older cities are facing the natural decay of their inner core, the result of both neglect and of the life expectancy of facilities built for a rather limited span of time. Thus, looking at the patterns of future urban growth, a number of developments will be central in any understanding and management of the urban water system, such as: megalopolitanization and increased scatterization; recognition of limits to growth and the necessity to conserve resources; diffusion of urban functions to outlying subcenters and, therefore, a more diversified internal structure of the city of the future; increased complexity and the need for more centralized (but deconcentrated) control; the use of potential technological breakthroughs associated with the “post-industrial city” altering the form, structure and operation of urban
aggregations and offering solutions to urban hydrology problems; and alterations in life styles with emphasis on recycling, reuse and reclamation which ultimately may be conducive to diminishing demands rather than continuously increasing water supplies.

It is the last remark that points to a basic debate today in all discussions of natural resources management, i.e., a probable, some would say imperative, move from “technical fixes” to “non-structural” solutions (or a combination of both) to many of our contemporary problems or challenges. Two observations, then, become particularly relevant at this point. First, that in general, more technology is available than is being effectively used. And, second, that the design of community water systems is not fundamentally limited by available materials and technologies; rather it centers around the knowledge of socio-economic requirements and the policy alternatives related to sustainable development rather than simple, but inequitable, economic growth. Impoverished populations are at the core of the vast citizenry expected in Third World urban agglomerations.

One way of summarizing long lists of concern, conflicts and crises linking sustainable development and integrated urban water management is through a cross-cutting list of a number of interacting issues and crises.

a) A water supply and demand crisis that represents a predominantly engineering dimension. Here one should include management and population growth issues such as the promotion of more desirable levels and patterns of use; augmenting fresh water supplies through e.g. conservation, reuse, desalination, transport of water from other areas; conjunctive water use with withdrawals from aquifers, reservoir storage, etc.

b) A deteriorating water quality crisis that can be translated into an ecological dimension of urban water problems. Here one encounters a variety of health issues, poor water quality, waterborne diseases, lack of adequate safe drinking water supplies and sanitation qualities, groundwater contamination, as well as interference of water resources systems with the proper functioning of natural life cycles.

c) An organizational crisis exemplified in a management dimension, i.e., the appropriate mix of competent personnel, facilities and procedures, as well as legal procedures and administrative guidelines. The literature refers here to capacity building and institutional mobilization.

d) A methodological crisis, not only in terms of availability, validity, reliability or comparability of data but also as part of combining information and judgment, modeling, and the building of useful Decision Support Systems.

e) A perceptual and cultural crisis, related to public awareness involvement and participation. Historical evolution of traditional values, level of socio-economic development, patterns of social structure and stratification, are all critical elements of a civic culture that addresses underlying causes of water scarcity. Here are also the questions as to whom does the water belong to; to what extent is it part of the commons, or private property; the rights of states, of corporations, or commercial interest; and, the challenge of separating water needs from wants.

Approaches to water unrest, contestation, and conflict

Mounting concerns about the environmental impacts of human activities, potential climatic shifts, expanding populations and the rapid growth of megacities are part of the pressing need to develop 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. The massive growth of megacities in developing countries has also created serious problems for extending water and sanitation services to urban population,
typically growing between two to three times faster than the national population. Following conceptual and methodological developments, the new paradigm of Integrated Water Resources Management (what some have been calling the “big bang” model) with its underlying principles, standards and criteria for managing complex urban systems, also includes policy recommendations for new pricing mechanisms that could help cope with the burgeoning water demand in these megacities.

The dual challenge of rising populations and of increasing water scarcity, leads to speculation as to the necessary or sufficient connection between water demands and conflict. This relationship is not obviously deterministic as it depends on a whole range of contexts related to willingness to cooperate and on the variety of responses to a cultural range of concerns, confrontations contestations and outright conflicts. The cries as to forthcoming “crises,” “catastrophes” and “water wars,” or “peace through water cooperation,” are expressions of simplistic reactions to significantly different contexts. The implications of water challenges, stress or scarcity, depend on a host of factors with indirect rather than direct linkages. History may provide some explanations. Cultural distrust of authority, level of development, disparities between rich and poor, geopolitics, transboundary interdependencies, climatic shifts, external hydrological events, etc., are all part of a rich combination of a non-linear sequence and of a highly complex “model” of critical variables and their interrelationships.

It is at this point that a promising start may be in the search for a typology that would express both similarities and differences in understanding urban water unrest. The sources of such a search include:

a) population growth and hyperurbanization (“growth”)
b) poverty and North/South disparities (“equity”)
c) “globalization” and water privatization (“commodification”)
d) water scarcity and stress (natural and anthropogenic)
e) intersectoral conflicting water demands (“competition”)
f) transboundary interdependencies (“spatial” integration).

Such cross-cutting dimensions can be combined with a variety of initiatives to create or access water infrastructures. The processes and emerging alternatives include economic attempts for an increasing role of the private sector; new actors in terms of NGOs or Community Based Organizations (CBO), ad hoc cooperatives, neighborhood associations, or local actors attempting to tackle, in particular, poverty. Other considerations here (e.g. the proposed “Water Resources Sector Strategy” of the World Bank), make a distinction between broad and poverty-targeted development strategies as they relate to either resource management or service delivery. Another cross-impact approach (see e.g. AID’s approach to population and water) results from a matrix that combines type of resource (social resources/water resources) and quantitative aspect of water resources (relative abundance/relative scarcity).

The task to be undertaken in the initiative of UNESCO is a clarification of water strategies and approaches, the backdrop of resistance to alternative water development schemes, and the centrality of poverty as an underlying cause in the context of an urgent need to provide needed adequate and good quality water to increasing segments of the population (perhaps one should recall here, the phrase of the general director of Suez-Ondeo, “L’eau pour tous, vite” – in La Vraie Bataille de l’Eau). It is in these last remarks that one finds two dominant policy recommendations that have been put forward, i.e. either raise fees to existing users; or, enhance performance of urban water utilities, perhaps by privatizing them, creating water markets, or contracting selected water services to the private sector.

Political resistance to such proposals (coupled with general failures in developmental
efforts) has led to open confrontations, rioting, and outright conflict. Citizens’ reaction in such places as Jakarta, Indonesia; Cali, Columbia; Johannesburg, South Africa; and Cochabamba, Bolivia focused attention on rising water scarcity in cities and to needed systems for serving the citizenry efficiently and equitably. It is our intention to document more fully the range of all these unrests and full riots, as in the case of Cochamba in January and February 2000 which led to the death of one person and the injury of at least 46 others with the police using live ammunition and tear gas against the demonstrators (for a lively account see the extensive write-up by William Finnegan in The New Yorker of April 8th, 2001 entitled “Leasing the Rain; the world is running out of fresh water and the fight to control it has begun”). Stories of confrontation appeared in the summer of 2002 when a severe drought in southern Europe forced governments to send police forces to stop raids on water systems (Sicily and Sardinia), or what the Greek press called “the beginning of the civil water war” in Thessaly between irrigators and other water interests. Ferocious protests took place also against privatization of electricity companies in Arequipa, Peru, with mobs campaigning through the city, building barricades and forcing the government to impose a state of emergency and a curfew after one death and 200 injuries. Civil unrest has also been reported in July 2000 in China’s Shandong Province in response to planned reallocations of water.

Consequences and implications
At the end, a complex urban water problematique must address more fundamental questions of poverty eradication, economic development, ecosystemic integrity and of equitable access to natural resources. In such a context the challenge of rising water scarcity and the concern with urban water quality and the attendant conflicts require an ability of parties-at-interest to cooperate and compromise; to reach agreements on how water will be allocated; and as to how the drift towards a “commodification” of water could avoid potential conflicts derived through an emphasis on forces of “privatization,” “market” or purely economic maximization criteria, especially in nations with sharply different value systems and of increasing gaps between poor and rich. In most of the emerging megacities a large proportion of the urban population consists of poor people, sometimes referred to as the “informal” population. But the “poor community” is not homogeneous, as they represent different ethnic, religious, and cultural groups that relate also differently to resources, society, or social networks, or to the ability or willingness to act towards change.

Central here is also the debate about the ability of the urban poor to pay for water as study after study has pointed out that the poor pay to street vendors for a litre of water as much as 5 to 20 times what their affluent neighbors pay for municipal supplies. But the problem remains the same: there is an immediate need for massive investments for both basic and advanced water infrastructures. The debate that follows tends to either emphasize a pragmatism that revolves around the assurance that the private sector can deliver public sector resources; others (while recognizing the forces of globalization and privatization) underscore the need for protection of a vital social and ecological resource and the requirement for openness, transparency, and strong regulation of a shift in the provision of water by private companies. Essentially, privatization offers no panacea for the problem of rising water scarcities in cities. And behind all such debates is the notion that water and sanitation are not just basic needs but fundamental human rights.

What all the above indicate, is that we must consider new conceptual, methodological, and organizational responses in managing complexity and uncertainty in fast changing and transforming cities. The patterns of urban growth are different from past experiences in terms of the combination of explosive population growth and spatial expansion; the lag between economic development and investment capacity; matching center and periphery;
new institutional mechanisms; increasing importance of environmental concerns; and a host of exogenous factors such as interdependence, globalization, or climatic anomalies. In this context, studies across many countries have produced long lists of comprehensive approaches; coordination mechanisms; stakeholders involvement; local and regional responsibility and accountability; sustainability principles and environmental ethics; decision support systems and risk management; long-range, macro-engineering emphasis; and innovative approaches in trade-off considerations. The vocabulary of policy formulation, management, and implementation, entails fundamental changes in outlook, visionary and goal-oriented commitment as well as acceptance of the central premise that social, technical, economic and environmental problems are intertwined and must be resolved together. In the dynamic context of today’s megacities there must be not only a better perception and understanding of water related challenges; but, also, more pragmatic policy initiatives for devising means of preventing and solving water related conflicts as well as new institutional structures to better handle aggregate competing and conflicting water demands.

The proposed effort will concentrate on the challenge of conflict genesis and conflict resolution as part of new and on-going efforts for developing pragmatic and culturally sensitive initiatives in integrated urban water planning and management. This would entail also a consideration of the combination of multiple objectives, increased geographical scope and conflicting and multiple choices. They are all part of a challenging problematic that must address simultaneously poverty eradication, economic development, equity and ecosystemic integrity. This combination must also recognize the difference of patterns of urbanization between developing countries and earlier industrialized ones; different ideological contexts; problems of data; and, the continuous debate between structural and non-structural approaches. New development efforts demand also increased stakeholders’ participation in decision making, strong demands for transparency and accountability, and holistic approaches. The building of political consensus, the search for conflict management, the promotion of local initiatives are also part of a “water democracy” in the search for encouraging a civic culture of sustainable and equitable communities and societies. This participatory and anticipatory approach requires a strategy that combines “envisoning” (sharing the dream, sharing the goals); “empowerment” (in terms of joint decision making); and “enactment” (or implementation and pragmatic urban water management).

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