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Water Ethics Perspectives in the Arab Region

منظور لأخلاقيات المياه في الوطن العربي

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Abstract: Water ethics has only recently emerged in academic and development arenas as an independent field of professional discussion. Concerns over water conservation and adequate access to basic needs of water and sanitation pose a difficult ethical dilemma that should be addressed based on societal and ethical frameworks. Issues such as water allocation and pricing, privatization of various water services, and efficient water management need to be contested within an ethical framework according to principles of equity and social justice. This paper presents the basic concepts of water ethics, as well as water ethics perspectives and applications within the framework of integrated water resources management (IWRM) in the Arab Region, which suffers from one of the fastest growing water deficits in the world. The deteriorating status of the water resources situation in the Arab Region is no longer tolerable due to the high costs in terms of negative environmental consequences and deteriorating livelihoods of poor populations associated with lack of access to clean water and sanitation. Nevertheless, most of the national efforts for IWRM implementation in the Region have been dominated by neo-liberal economic policies stressing privatization of various water services; cost recovery through different pricing and tariffication schemes; as well as sectoral water (re)allocation. However, many negative impacts due to the shift to neo-liberal market-led economies have surfaced throughout the developing world in the past decade and a half, especially with respect to the increased levels of poverty and worsening environmental degradation. It is, therefore, critical to adopt IWRM approaches in the Region within an ethical framework that takes full consideration of all social implications regarding the poor, and that could be used as a means to achieve water-related international goals of poverty reduction. Finally, the paper also shows that there is no contradiction between Islamic beliefs, which constitute the chief cultural and ethical source of most Arab societies, and worldwide accepted IWRM principles and associated ethical frameworks.

Keywords: *Water ethics, integrated water resources management, Arab Region, water ethics in Islam.*

المستخلص: برز مؤخراً في الأروقة الأكاديمية والتنموية ذات العلاقة بالمياه موضوع «أخلاقيات المياه» كحقل مستقل بذاته يفرض نفسه في المناقشات المتخصصة في المياه والحوارات المتعلقة بحاكمية المياه واستخداماتها. ويرى العديد من الباحثين أن قضايا المحافظة على المياه والحصول على الاحتياجات الأساسية من مياه الشرب وخدمات الصرف الصحي تفرض إشكالية أخلاقية صعبة ينبغي التعامل معها ضمن إطار اجتماعي وأخلاقي. فقضايا مثل توزيع حصص المياه بين مختلف المستهلكين وفرض تعرفة على استخدامات المياه، وخصخصة خدمات المياه المختلفة، والإدارة الكفء للمياه ينبغي مناقشتها ضمن إطار أخلاقي مبني على مبادئ الإنصاف والعدالة الاجتماعية. تهدف هذه الورقة البحثية إلى التعريف بالمفاهيم الأساسية لأخلاقيات المياه، وتقديم منظور لتطبيق أخلاقيات المياه ضمن منهج الإدارة المتكاملة للموارد المائية في الوطن العربي، الذي يعاني من أحد أشد أوجه العجوزات المائية سرعةً في التفاقم على مستوى العالم. إنّ الوضع المتردي لمصادر المياه في العالم العربي قد وصل إلى درجة من الشدة بحيث لا يمكن احتماله بسبب تكاليفه الباهظة المتمثلة بنتائجه البيئية السلبية وتدني مستوى المعيشة والحالة الصحية للمجتمعات الفقيرة لعدم قدرة هذه المجتمعات على الحصول على

مياه آمنة ونظيفة وخدمات الصرف الصحي. وبالرغم من هذا الوضع المتأزم، فإن معظم الجهود الوطنية في تطبيق الإدارة المتكاملة للموارد المائية تهيمن عليها سياسات اقتصادية ليبرالية جديدة يتم فيها التركيز على تخصيص خدمات المياه المختلفة، واستعادة التكاليف من خلال أنظمة تعرفة وتسعير خدمات المياه، بالإضافة إلى إعادة توزيع حصص المياه للقطاعات المستهلكة. إلا أن التوجه نحو تبني السياسات الاقتصادية الليبرالية الجديدة المحركة للسوق قد أدى إلى ظهور العديد من النتائج والتأثيرات السلبية في دول العالم النامي خلال العقد ونصف العقد الماضي، وبالأخص فيما يتعلق بارتفاع مستويات الفقر وزيادة التدهور البيئي. ولذا، فإنه من الأهمية بمكان أن يتم تبني منهجيات الإدارة المتكاملة للموارد المائية في المنطقة العربية ضمن إطار أخلاقي بحيث تؤخذ في الاعتبار جميع التداعيات الاجتماعية الخاصة بشرائح المجتمع الفقيرة وبأن يكون ذلك وسيلة لتحقيق الأهداف الدولية ذات العلاقة بالمياه في تقليص الفقر. وفي النهاية، تشير الورقة إلى عدم وجود تعارض بين مبادئ العقيدة الإسلامية، التي تمثل المصدر الثقافي والأخلاقي الرئيس لمعظم المجتمعات العربية، وبين مبادئ الإدارة المتكاملة للموارد المائية والإطار الأخلاقي المصاحب لها، المقبولة عالمياً.

كلمات مدخلية: *أخلاقيات المياه، الإدارة المتكاملة للموارد المائية، المنطقة العربية، أخلاقيات المياه في الإسلام.*

Introduction

Water ethics, as a specific and distinct philosophical field, is emerging in academic arenas, professional discussions, and dialogues on water governance. Concerns of water conservation, as well as adequate access to basic needs of water and sanitation and the deprivation of poor and marginalized communities throughout the world of such a fundamental human right, mostly due to the lack of empowerment and the inability to pay for the service, pose a difficult ethical dilemma that needs to be solved based on societal and ethical frameworks. These frameworks are also necessary to address issues such as the allocation of limited water resources and its relationship to efficiency, productivity, valuation, as well as principles of equity and social justice. Such ethical perspectives are especially significant for consideration of environmental conservation and sustainability for future generations within the contexts of integrated water resources management.

The philosophical side of this paper focuses on the basic concepts of environmental and water ethics and their relationship to human normative behaviour. The practical and institutional side of the paper, on the other hand, deals largely with environmental and water management laws and policies in the Arab Region. Most countries in the Region now have laws and policies relating to the environment to assess and mitigate the impacts of development and to control the contamination and depletion of their natural resources. These laws and policies should be scrutinized from ethical perspectives to ensure that their social impacts do not contradict with the goals of poverty alleviation in the Region.

1. Ethics and Normative Behaviour

Ethics is a branch of philosophy that looks into morality. Accordingly, "[ethics] looks at the meaning, therefore, of statements about the rightness or wrongness of actions; at motives; at blame; and fundamentally at the notion of good or bad" (Katz, 1991). Nevertheless, ethics is not only the result of existing human or cultural values. Much of environmental ethics, for example, stem from other types of knowledge, such as ecology, which has driven many of us to think morally about our uses and abuses of the environment, and the impact that societies and modern forms of development has had on natural resources.

Normative behaviour implies the involvement of values, or the foundations of moral principles, adopted or accepted by a particular society. By definition, values are "the moral principles and beliefs or accepted standards of a person or social group, so that they are likely to be culturally relative" (Katz, 1991). This means that values are likely to be culture-specific, and thus they tend to be relative. However, moral principles are usually used to assess actions as morally 'right' or 'wrong' and hence subject them to an absolute standard rather than any culturally acceptable

way of doing things. This idea is extended towards the values that humans may or may not hold regarding the environment, the use of its natural resources, and the impacts of human activity on it. At the root of laws and policies (standard manifestations of human normative behaviour) that intend to protect and preserve the environment from human activity impacts and lay a set of moral principles and beliefs that are accepted by different societies (Simmons, 1993).

2. Water: the Crucial Natural Resource

Throughout history water has always been looked at as a special natural resource which is essential for the existence of life and human civilization. Fierce competition has always existed among various species as they strive to secure their basic water needs and ensure their survival. Historically, one can trace the development of human societies in areas where freshwater is available and accessible. As the size of the human population is increasing and the standard of living improving, water use per capita has been increasing at twice the rate (Hinrichsen, 2003).

Livelihoods of poor populations are directly linked to secure an equitable access to clean water and rational management of water resources. Providing safe water and good sanitation is fundamental to people's health and welfare. However, finding sustainable solutions to produce more food with less water, whilst safe-guarding the environment is equally important. Provision of adequate quantities of clean water, and related sanitation services, both for domestic uses and food production allows poor people to expand their income earning opportunities, protect their health, and reduce their vulnerability to natural disasters.

3. Water Ethics: Global Perspectives

Global ethical perspectives of water resources management are based on the recognition of the complex interdependence between sustainable development and increasing poor people's access to water and sanitation services in order to alleviate poverty, sustain livelihoods of poor populations, and safeguard the environment. The importance of water for poverty reduction and achieving sustainable and equitable development was recognized in the Millennium Development Goals (MDGs). The Millennium Declaration sets the target of halving the number of people who are unable to reach, or afford, safe drinking water by 2015 (MDG No. 7). It also calls for discontinuing unsustainable management of water resources through the development of IWRM strategies at the regional and national levels. The significance of meeting global water challenges was reaffirmed at the World Summit for Sustainable Development (WSSD) in Johannesburg in 2002. The Johannesburg Plan of Implementation of the MDGs spells out concrete actions and targets to increase access to water and sanitation, and to put in place national IWRM plans.

Developing a comprehensive ethical framework that would set the base for equitable practices to mitigate global water-related poverty challenges became a necessity with the above-mentioned international efforts for efficient water management. This necessity was acted upon by United Nations Educational, Scientific and Cultural Organization (UNESCO) through the creation of the World Commission on the Ethics of Scientific Knowledge and Technology (COMEST) in 1997. To achieve its goals COMEST established four sub-commissions, one of which was the Sub-Commission on Freshwater Use which focused on water ethics (Brelet, 2004). In addition, the International Hydrological Programme (IHP) at UNESCO created an intercultural and interdisciplinary working group on ethics of freshwater that published a report entitled "Ethics of the Uses of Freshwater" (Rahaman and Varis, 2003). Moreover, COMEST established, with the IHP/UNESCO, the Research and Ethical Network Embracing Water (RENEW) with a mission to 'promote engagement in the ethical issues involved in the sustainable use and equitable sharing of freshwater resources' (Brelet, 2004).

Principles of Water Ethics

The work and publications of the Sub-Commission and the Network culminated in a framework for water ethics based on the following basic ethical principles: human rights and dignity, equality, solidarity, stewardship, transparency, participation, inclusiveness, empowerment,

and defining water as a common good. This framework views water as an exploitable good, from which all individuals within society have the right to use their basic needs for life. The framework also calls for keeping the integrity of water resources, as well as the respect to the values (or systems of beliefs) adopted by different societies including indigenous and marginalized ones. The following is an analytical description of the above principles that shows the inter-relationship between them all.

1. Human Rights and Dignity

Today more than one billion people throughout the developing world lack access to safe drinking water and three billion lack access to adequate sanitation. This failure, incurred by the international development assistance community, led to substantial human suffering which has been reflected in loss of dignified livelihoods as well as mass movement and forced displacement of poor populations seeking water. Considering water as a basic human right is extremely important since it encourages the international community, as well as national governments, to work hard towards the target of universal access to clean water. Moreover, acknowledging this right creates the necessary ethical pressure to implement it within national and international agreements and conventions (Gleik, 1999).

It should be noted that in international legislation, universal right to water was only expressed in the Convention of the Rights of the Child (Gleik, 1999). Additionally, in 2002 the United Nations Committee on Economic, Cultural, and Social Rights issued a "General Comment" which openly expressed that the concept of water management is not to be limited to its economic dimension only, and that access to water should be considered as a human right. The Comment clearly states that everyone is entitled to sufficient, affordable, accessible, safe and acceptable water for personal and domestic usage (UNESCO, 2003).

2. Equality

The principle of human equality stresses that all individuals within society should be provided with their basic needs on an equitable basis through universal access to clean water and sanitation (Brelet, 2004). Considering the concept of human equality is, therefore, very important at the policy development level when allocating water among competing sectors and interests in society. It is firmly established and accepted that first priority in sectoral water allocation must be given to basic human needs (Rahaman and Varis, 2003). However, income-generation and economic efficiency considerations also influence water allocation due to their important effect on socio-economic development and poverty alleviation efforts. Nevertheless, it is equally important to consider water requirements for sustainable livelihoods of the poor populations, not only economic efficiency, in order to achieve overall societal development (Vasiliev, 1998).

Appropriate prioritization is especially significant in arid and semi-arid regions, such as the Arab Region, with limited water availability. Among major conflicts with ethical ramifications in such regions, is allocating water for irrigation. Given that food is also a basic human need it is only ethical to provide water for agriculture in the interest of supporting human life through the production of food. However, in many cases supporting agriculture takes the form of subsidizing water for irrigation and encouraging farmers to plant high-value cash crops that require large amounts of water and deprive other sectors, including the maintenance of ecological integrity, from their necessary water needs (Rahnema, 2002). Therefore, it is ethically required to look into environmental and socio-economic consequences and consider the use of water pricing incentives for water conservation when allocating water for irrigation. As a matter of fact, allocating water to support the ecosystem is an ethical dilemma in itself. The inter-generational dimension of human equality constitutes a firm ethical basis for recognizing in-stream uses and ecological and environmental conservation in water allocation policies.

3. Solidarity

Solidarity among various water users is an essential prerequisite for universal and equitable provision of basic needs of water for all. Water use and management, especially

in drylands, are always fraught with conflicts arising from water scarcity and non-uniform distribution both spatially and temporally. These conflicts are mainly manifested through intra- and inter-sectoral water allocation problems, as well as issues of upstream-downstream interdependence. Water sharing in cases of scarcity is among the earliest subjects of conflict between water users on the international and national levels, especially when priority in water allocation is given to the agricultural sector over other sectors (Rahaman and Varis, 2003).

4. Stewardship

Stewardship towards water resources and the environment is closely inter-related to principles of human rights, equality, and solidarity. Wise use and conservation of water quantity and quality, as well as respecting the environment and securing its basic requirements for ecosystem maintenance, are fundamental for the application of water ethics principles. A major decision is how much water should be allocated for current human use (for agricultural, industrial, and domestic purposes) and how much should be used to maintain ecosystems and conserve the environment for future generations (Rahaman and Varis, 2003). This problem is further magnified in arid and semi-arid regions. It is therefore necessary to quantify the costs and benefits to society that stem from allocating water for ecosystem maintenance. This process requires accurate information and data on water demands of various sectors and human needs and the value of ecosystems and natural resources for current and future generations (Selbourne, 2000).

5. Defining Water as a Common Good

Water resources occur naturally and provide an open access for all. Thus water is considered as a common good, especially that it is an essential requirement for life. A common good is defined by three characteristics: (1) non-rivalrous: one person cannot deprive others from using it; (2) non-excludable: impossible to restrict others from using it; and (3) non-rejectable: individuals cannot abstain from its consumption even if they decide to (Bannock *et al*, 1987). However, according to Hardin (1968), over-exploitation of common goods occurs due to the phenomenon called the "tragedy of the commons" where users ignore the impacts of using the resource on its current and future availability for other uses and users.

Economists' prescription to solve the "tragedy of the commons" and conserve the resources is to clearly define private water rights and establish water markets. In fact, both Agenda 21 and the Dublin Principles (WMO, 1992) positioned the argument of treating water as an "economic good" highly on the global agenda. This argument has received worldwide acceptance, as it came out at a time when neo-liberal ideas started to have a very strong influence on international development and policy debates, especially regarding water management. However, according to Rogers *et al* (1998), this has created confusion because water is not a typical private economic good since it is essential for human life, and water and sanitation are regarded as services that people have a right to regardless of whether they are able to pay for them or not. Therefore, the only complete and viable solution to the "tragedy of the commons" can be achieved by full recognition of equality, solidarity, and concepts of human rights by decision makers, managers, and users.

6. Participation, Empowerment, Inclusiveness, and Transparency

The importance of participation does not only lie in being among the principles of ethical water management or good water governance. Experience shows that with an open social structure, which enables broader participation by civil society, water governance is more effective because of the civil society's ability to influence government. Therefore, citizens should be able to have a say, directly or through civil society organizations, in relevant decision making and policy formulation processes (UNDP, 2003). Government regulations that facilitate local participation in water management are necessary for a clearer and more effective role of non-governmental organizations and civil society in general (Rogers and Hall, 2003).

Therefore, empowerment of local communities, especially remote and marginalized

ones, through creating an enabling environment for more effective action of the civil society is an important prerequisite to achieving a meaningful participation in water resources management. Moreover, the effectiveness of government policies depend on ensuring participation throughout the policy formulation and decision making processes. This would create more confidence in the developed policies and the institutions through which such policies are formulated.

On the other hand, participation crucially depends on all levels of government following an inclusive approach when developing and implementing water policies. Inclusiveness can be achieved through social mobilization and freedom of association and speech. As such, institutions should communicate with all stakeholders involved in the issues of water resources management. This entails conducting accurate and well-informed stakeholder analyses at all levels of decision-making, whether at the policy level (as mentioned above) or at the local level that requires the inclusion, empowerment, and participation of local people. Finally, water management should be done in an open manner with full transparency. All decision making and policy formulation processes should be transparent so that all involved stakeholders could follow the details of developed policies. For that, various roles in the legislative and executive branches of government need to be clear, and decision-makers, private sector, and civil society organizations should be accountable to the public. Accordingly, the consequences of any violation of policy provisions should be clear among stakeholders (Rogers and Hall, 2003).

Water Ethics and Rational Water Governance

1. Rational Water Governance

Water governance refers to the range of political, administrative, economic, and social systems that are put in place to develop and manage water resources and the delivery of water services (UNDP, 2003). The general principles of rational and effective water governance are basically equity and efficiency in allocation of water resources and access to clean water and sanitation; balance between social, economic, and environmental water utilization and maintenance of ecosystem integrity; holistic and integrated management approaches; as well as full community participation in the management of local water resources. These principles, which obviously coincide with the water ethics principles discussed in the previous section, are addressed through IWRM approaches that are characterized by transparency of decision-making, as well as accountability and responsiveness to society's value system(s). Therefore, rational water governance and its IWRM tools are the main mechanisms through which a society's water ethics framework is implemented.

2. Integrated Water Resources Management

The concept of IWRM has been coined and advocated by the international community since the early 1990s, and it gained wide acceptance as an appropriate management tool for rational water governance. IWRM is an ecosystem-based approach that takes into consideration the inter-relationships between natural resources systems and socio-economic objectives, and attempts to integrate them with national development and poverty alleviation objectives. It should be noted that the IWRM approach can be implemented only within a society-adopted ethical framework. All management tools of IWRM should be based on established ethical principles for water resources management in order to be adopted by society. Otherwise some of these tools, especially economic instruments, might reduce access to clean water and sanitation among poor and marginalized groups of population.

The integrated nature of the IWRM approach ensures equitable access to water for all population sectors while taking full consideration of economic efficiency and environmental integrity. In other words, the individual human right of access to basic needs of water is ensured while the interests of the society as a whole in economic development and preserved environment are fully considered. Therefore, the concept of solidarity among various water users, with varied geographical and inter/intra-sectoral interests, is inherently embedded in the approach. Moreover, examples

where IWRM has been a useful tool in solving international and trans-boundary water conflicts suffice to show the importance of solidarity between different parties in solving such conflicts (UNDP, 2003).

Water Ethics Perspectives in the Arab Region

The Arab Region is experiencing one of the fastest growing water deficits in the world. The majority of the Region's countries have been consuming more water than their renewable supply for quite some time. However, this is no longer an option due to its high costs and negative environmental consequences that have been leading to a vicious cycle linking deteriorating status of water resources, in terms of quantity and quality, to deteriorating livelihoods. General lack of familiarity with participatory and integrated management approaches; fragmented institutional structures and conflicting mandates; outdated water pricing policies; imbalanced sectoral water allocation; persistence on solving increasing demand problems through expensive supply augmentation; and delegation of responsibility without the necessary devolution of power and financial resources in decentralization plans are among the major problems facing water management throughout the Region.

Water scarcity and uneven geographical and seasonal distribution, mismanagement and ineffective water governance, deficiencies in access to clean water and sanitation services in remote areas, as well as pollution and degradation of aquatic ecosystems have in most cases had severely limiting effects on development options for poor communities and other marginalized groups in the Region. Moreover, inadequate investment in societal, institutional, and human capacity development has worsened the situation. It is therefore critical to expedite the adoption of integrated water resources management approaches, within a societal ethical framework for water management, in order to enhance effective water governance and achieve poverty alleviation goals in the Arab Region.

1. Ethical Framework for IWRM Implementation in the Arab Region

With the issues of water scarcity and mismanagement coming up, countries in the Arab Region are faced with the pressing need to initiate cooperation among each other through regional programmes and develop their own national plans for the adoption of IWRM approaches. As a matter of fact, some countries in the Region have already started to establish the necessary institutions and develop national plans for IWRM implementation. It should be noted, however, that most of the national efforts in the Region for IWRM implementation have been dominated by neo-liberal economic policies that are globally gaining ground since the early 1990s as the main vehicles for growth and poverty reduction.

These country efforts, which significantly benefit from bilateral assistance programs with various donors and active international agencies in the Region, mainly rely on neo-liberal free market tools and mechanisms. Interventions in the water resources sector mostly constitute of decentralization schemes for local water resources and watershed management; privatization of water supply and other related services; development of water pricing schemes that ensure service cost recovery; sectoral water (re)allocation; expansion of access to water and sanitation; as well as water quality management. The main rationale behind the heavy reliance on such tools is that using free market principles and treating water as an economic good enhances water use efficiency; helps balancing the budgets of water supply authorities; leads to better conservation of water resources; and eventually helps improve the access of poor and marginalized communities to water and sanitation.

However, many negative impacts of market-led economies have surfaced throughout developing countries in the past decade and a half. The most significant of these impacts, faced in certain cases, have been increasing poverty levels among most severely disadvantaged sectors of society, as well as environmental pollution and degradation when rules of free market economy are left alone in control (Woodhouse, 2001). Promoting the change to across-the-board free-market water pricing systems, for example, has

always proved to be politically difficult due to the insensitivity of such systems to the weak ability of poor populations to pay for their access to basic water needs. This is specifically true in places where water has been historically heavily subsidized, as the case has been for a long time in the Arab Region. Therefore, the introduction of IWRM approaches should be done in such a way that earlier-acknowledged governmental responsibility to provide adequate water services for poorer sectors of Arab societies is not abandoned. On the contrary, adoption of the IWRM approach should be used as a means to achieve water-related international goals of poverty reduction.

2. IWRM Tools Used in the Arab Region

Below is an analytical description of the main pillars that have been recently used in the Arab Region for IWRM implementation, along with some general guidelines for implementing such tools within an ethical framework for water management adopted by societies in the Region.

Decentralization

Theoretically, decentralization should improve efficiency, accountability, and equity in natural resources allocation because it can more closely connect the benefits of local public services to the costs entailed. This is based on the belief that local governments are more knowledgeable regarding their communities' needs than the national governments. Moreover, decentralization has been seen as an effective tool in promoting good governance and democracy because it is easier to hold local governments accountable (to the local constituencies and national governments alike), and it can be successful in making the "state closer to the people" by increasing the participation of local communities (World Bank, 1997; 2000). In water resources management, decentralization allows for a wider margin of cost recovery of water and sanitation provision, efficient allocation of water to various economic sectors, as well as providing the necessary institutional enabling environment that is needed for proper accountability and control over services.

Nevertheless, decentralization has to be implemented appropriately and as open and transparent as possible in order to be considered ethical, because it has its obvious shortcomings and disadvantages. These include the possibility of the occurrence of elite capture that promotes clientelism instead of democratic participation. Local authorities might be heterogeneous entities pursuing a range of interests that could be in conflict with one another. More often in developing countries, including the Arab Region, the leadership of local authorities falls into the hands of the wealthy and powerful. The interests of the poor would not be of immediate concern to these authorities in such situations (Engberg-Pederson and Webster, 2002).

Moreover, there may be some problems facing water conservation in certain situations especially where the benefits may be national but the costs borne only on the local level. Central governments should provide, in such cases, innovative incentive structures containing a broader vision for local benefits of water conservation. This would equip local governments and the people at large with necessary incentives to conserve water, apply ethical principles of water management to local water projects, and enforce regulations that would protect their water resources from pollution (Lutz and Caldecoff, 1996; Larson, 2002). Therefore, decentralization is needed in water governance, but it should be balanced with an active central government role in order to achieve sustainable water management that would adhere to water ethics principles (Rogers and Hall, 2003).

In the Arab Region, different decentralization schemes for irrigation and domestic water supply have been adopted in various countries. Each experience has led to different impacts, but in general decentralization has raised to a certain extent the sense of responsibility among farmers and resulted in achieving higher water use efficiencies (Attia, 2003; ESCWA, 1999). However, while some countries in the Arab Region, such as Tunisia and Egypt, have already successfully implemented decentralization schemes, some other countries are still in the beginning stages of creating such an environment. In Lebanon, for example, the Ministry of Energy and Water has just started to plan a decentralization scheme for water resources management on the national level.

Other countries in the Arab Region, on the other hand, followed a more centralized approach, such as Algeria where the government created the Algérienne Des Eaux (ADE) agency for central planning and execution of all water management operations and the implementation of national water policies. Finally, it should be noted that it is still too early to evaluate the overall impacts of decentralizing water management in the Arab Region because the whole idea is relatively very recent in the Region. Even in the countries that have had a good start with the process, it is still premature to claim that they already enjoy a good enabling environment based on a societal ethical framework for water management.

Privatization

Policy makers in the Arab Region have chosen privatization as a strategic decision that involves major reforms in line with overall structural adjustment programmes aiming to reduce budget deficits and meet the increasing demand for water and sanitation services. Privatization contracts are being implemented in Gaza, Jordan, Lebanon, Qatar, and Yemen; while privatization agreements are being seriously considered in Bahrain, Egypt, Kuwait and Saudi Arabia. However, the Region still suffers from many problems related to water management privatization. Knowledge and information regarding the chosen privatization scheme(s) and their expected results have not been made available for societies throughout the Region in order to avoid any marginalization or distrust among the public.

Moreover, while in some countries of the Region there is strong political will and acceptable public adaptation to implementing water privatization other countries are facing severe resistance to this process. Opponents to privatization are accusing the governments of using non-transparent processes to sell off public assets cheaply and put responsibility for a vital scarce resource in private sector hands (ESCWA, 2003). Countries opting for privatization of water service delivery in the Arab Region should stress transparency and effectiveness and recognize social and ethical considerations while setting up the needed institutional structures and developing the necessary legal and regulatory frameworks that would ensure transparency and justice of privatization schemes.

In general, private sector participation has been widely promoted in water resources management as part of neo-liberal reforms that have been driven by multilateral and international financial institutions and adopted by most bilateral development agencies. Despite local community and civil society resistance to various attempts at privatizing water resources, privatization is viewed by many in the international development arena as the best means for enhancing operational efficiency in water services and increasing financial resources that would help expanding access to water and sanitation. The rationale behind this position is that experience with using public utilities for water service provision has shown that such institutions suffer from the inherent public sector inefficiency and corruption and that in general they are too slow in adapting to increasing demands.

However, increasing private sector involvement in water resources management remains controversial. While many believe that engaging the private sector would accrue enormous benefits to society, others believe that the process of providing water and sanitation services is strictly a matter of public governance (Bennett, 1998). For example, private water companies would not be eager to invest in water utilities unless they are profitable. Consequently, affluent urban neighbourhoods would get the lion's share of investments, which are usually already better served compared to peripheral rural areas, due to their greater ability to pay for their services. Moreover, increased productivity through privatizing water resources management usually involves major "labour shedding" which, in turn, entails social problems (Budds and McGranahan, 2003; Rees, 1998). Consequently, major ethical questions should be asked regarding the deteriorating livelihoods of the concerned labour force families, as well as those of urban and rural low income communities left out of service, versus society's gains in efficiency and productivity.

Therefore, what can be said about private

sector participation in water management is that it is not a magic solution. Questions should also be asked, when decisions are taken about privatization of water services, regarding considering water as a common good or as an economic good with all the social and ethical ramifications of such decisions. In some cases, when people in poor neighbourhoods are not able to pay for water and sanitation services, difficult decisions have to be made. Such cases can be addressed only through public regulation based on ethical principles that consider water as a basic human right for all. From an ethical perspective, water can be optimally managed when it is considered as a common good which possesses an "economic value" that must be collected from users in order to ensure conservation and prevent wastage. Even with privatized management, to achieve the required level of access to water and sanitation a combination of regulation, targeted subsidies, and obligatory service fees is needed to bring about the desired goals and benefits (Budds and McGranahan, 2003; Guiterrez, 2001).

Water Pricing

As mentioned earlier, well known is the overall economists' preference for defining private water rights and creation of water markets through viable water pricing mechanisms in order to solve the problems of over use (Johansson *et al*, 2002). Building on the assumption that humans are rational consumers, if service costs are covered by the State and hence no water pricing mechanisms exist, there will not be any incentive to conserve water and use it rationally (Abu-Zeid, 2001; Dinar and Subramanian, 1997). On the other hand, it is believed that long term sustainability of water supply services is achieved only by fully recovering all the incurred costs of infrastructure, operation, maintenance, administration, and development of the needed facilities (Budds and McGranahan, 2003). Consequently, proponents of cost-recovery water pricing mechanisms claim that efficiency gains from such mechanisms benefit all service users, including the poor sectors of society who would gain by becoming connected to a reliable and sustainable system.

Yet, the notion of an optimal water-price does not command consensus among economists and policymakers, as there is still disagreement regarding the derivation of the "right" water price. Because water is vital for life, and it is considered as a basic human right for all, its value should not be defined in economic terms only but should also reflect the social, environmental, cultural, and religious morals placed on it. The commodification of water in general is fraught with social and ethical problems since water pricing mechanisms based on full cost recovery and total removal of subsidies mostly lead to unfair distribution of service costs. Ethical concerns of "human equality" and "solidarity" across economically disparate groups in a society could necessitate the implementation of differing pricing mechanisms for the sake of sustaining livelihoods and expanding access of the poor to water services (Dinar and Subrumanian, 1997). Affluent sectors would in effect subsidize the water supply for poor sectors of the society. However, it is important not to totally sacrifice water demand management considerations, for the sake of equitable access, in order to induce water conservation among all users (Linam, 2002).

According to ESCWA (2003), water-pricing schemes currently used in some Arab countries are not leading to water conservation and improved water use efficiency. Setting water prices at lower than production costs is still common in most of these countries. This is especially flagrant in the irrigation sector, where water is still highly subsidized in several Arab countries in spite of the widespread water over-consumption in this sector throughout the Region (Abdurazzak and Kobeissi, 2002). It should be mentioned, however, that some Arab countries are already implementing efficient water pricing schemes, which take ethical issues of societal solidarity and equitable access to water into consideration. In Jordan, for example, a water pricing scheme has been implemented using the concept of the "lifeline rate schedule." The scheme is designed to recover the service costs while keeping "lifeline" basic needs affordable for the poor (Taha and Bataineh, 2002). Also, in Tunisia a progressive block rate and selective pricing of drinking water has proved to be efficient in cost recovery, as well as a means for enhancing equitable water use. Nevertheless, this system has not been without limitations in

terms of over use of water. Bringing pressure to bear on major consumers only, left small and average consumers, who are spared to a great extent by paying a heavily subsidised price, with very little incentives to conserve water.

Sectoral Water Allocation

Water resources problems in most Arab countries can be attributed not only to natural limitation in water availability, but also to rising demands and unsustainable practices of overuse in various sectors, diminishing resources owing to increased population, lack of sustainable water policies, as well as the lack of the adequate financial resources for water resources development. According to ACSAD (1999), agricultural water sector requirements account for most of the water used in Arab Region. In fact, the agricultural sector is by far the largest user accounting for around 85% of total use in the Region compared to around 60% worldwide water use for agriculture (Berkoff, 1994). Moreover, not only countries blessed with large river flows in the Region, such as Egypt, Iraq, and Syria allocate most of their water supply for the agricultural sector, but also countries like Jordan, Kuwait, and Yemen which suffer from severe shortages still over allocate water for agriculture. The problem is even worsened by the phenomenally low irrigation efficiency prevalent in the Region where average water requirement per hectare is estimated at 11,500 m^3. On the other hand, agricultural sector contribution to the gross domestic products (GDP) of various countries in the Region is relatively small. Moreover, the goal of self-sufficiency in food production and food security, which is the stated reason behind sticking to the flagrant imbalance in sectoral water allocation throughout the Arab Region, is proving economically and physically unrealistic day by day.

Therefore, appropriate prioritization of water allocation to various user sectors can be considered among the major ethical challenges in water management throughout the Arab Region. Unless serious efforts are made to increase water use efficiency in irrigation, reuse of treated wastewater, and cultivation of crops that do not require large amounts of water, it is expected that the agricultural sector would continue to consume water amounts beyond the available capacity. This water overuse would threaten other economic sectors (due to diminishing availability) and eventually subject the health and welfare of people in the Region to serious risks (ESCWA, 2003). Accordingly, decreasing water use in agriculture, and reallocation of some conserved resources to other sectors (especially domestic), is necessary to ensure the availability of basic water needs for maintenance of public health and economic development in most of the Region's countries.

For some countries in the Arab Region, however, the agricultural sector presents the main economic backbone for food production, and the main driver for sustaining livelihoods through employment. This is extremely important in countries like Egypt, Iraq, and Syria where subsistence farming is among the largest economic sectors. In such countries, utmost consideration should be taken with respect to sustaining livelihoods of subsistence farming communities when sectoral water reallocation is considered. Encouraging subsistence farming which is not an intensive water consumer, rather than large-scale industrialized farming systems, would significantly reduce the threat to both water availability and pollution without threatening the livelihoods of farmers and the economy of rural areas in the Arab Region. In fact, increasing irrigation efficiency, while sustaining the livelihoods of families that are dependent on subsistence farming systems, is among the major challenges facing the IWRM implementation throughout the Arab Region (Herromoes, 2001; Rahaman and Varis, 2003).

Access to Water and Sanitation

The main issues of concern under water and sanitation are access to safe drinking water and sanitation services, as well as water quality management. Development of water and sanitation infrastructure and facilities, and provision of equitable and universal access to such services, is considered as a basic human need (and right) and a cornerstone for economic and social development. In the Arab Region, access to safe drinking water is approaching 100 percentage of the urban population (Berkoff, 1994; UNICEF,

1998). However, only 60 percentage coverage has been reached in rural areas of the Region, which is well below the developing countries' average that was raised from 71 percentage in 1990 to 78 percentage in 2000.

This gap between the urban and rural areas' services is reflected, as well, in some health indicators such as the infant mortality rate (IMR) in the Region. Despite the decreasing IMR levels in the Region as a whole, as a result of growing water and sanitation services (Berkoff, 1994), according to the Arab Human Development Report (UNDP, 2002) great disparities in the IMR figures still exist between rural and urban areas. The ratio of rural to urban under-five mortality in the Region ranges from 1.21 to as high as two-fold. Even countries with high levels of water/sanitation services that succeeded in lowering the general under-five mortality rate still suffer from this difference, which poses a serious challenge in terms of equality of services for urban versus rural areas.

Measuring the quality of water/sanitation service provision includes both the quantity and quality of water, with the latter being especially important for domestic supply. An alarming indicator for poor water quality management in the Arab Region is the big difference between the access to safe drinking water and access to sanitation services in several countries of the Region. There is a pressing need for a policy shift in the Region toward continued expansion of water supply and sanitation coverage in rural areas linked to upgraded service level that ensures acceptable water quality coupled with enhancing water quality management at the household level (UNESCO, 2003). Evidently, more investment is needed throughout the Arab Region's rural areas in order to meet the international goals of water and sanitation coverage, such as the MDGs.

A major ethical challenge, therefore, throughout the Arab Region is to ensure that enough investments are made in water and sanitation infrastructure in poor and rural areas. It should be noticed that, because private water companies are usually uninterested in providing water services for poor and marginalized regions like remote rural areas due to their main interest in cost recovery issues, water sector interventions in such areas are usually mostly implemented by government agencies or nongovernmental organizations (NGOs) (Budds and McGranahan, 2003). Starting with the felt needs and existing capacity of poor communities, these interventions should allow expansion and upgrading toward internationally accepted standards of water and sanitation services (UNICEF, 1998). Whether government led or privatized, services should be operated and maintained with full participation by all stakeholders. Equality, especially gender equality, is a central issue in all aspects of increasing the access of poor people to good-quality water and sanitation services (Soussan, 2004).

Water Ethics in Islam

Water is given great importance in Islam, and it is considered as a blessing from God that sustains life. In addition, ensuring social justice for Muslims is among the cornerstones of the Religion. Most of the Prophet's "hadith" is about the preservation of justice and equality including equality in water use and access to water resources for all sectors of society. Consequently, true Muslim believers cannot grab water in excess to their needs since they are obliged to allow free access to any amounts of water beyond these needs (Faruqui, 2001; Naff and Dellapenna, 2002).

Islamic thought is the chief cultural and ethical source of predominantly Muslim Arab societies. Consequently, any ethical framework for water management in the Arab Region has to be in agreement with Islamic beliefs and condoned by relevant Islamic rules. Therefore, looking into Islamic ethical bases for integrated water resources management is a necessary prerequisite step for developing such a framework. Actually, extensive Islamic rulings cover a wide range of issues in environmental and water management from environmental stewardship and water conservation to sectoral allocation, water pricing, and privatization in the water sector. Below is an analytical description of these rulings, which are all based on Islamic values that call for social justice and participation of all sectors of society in the management of its common natural resources.

1. Environmental Stewardship and Water Conservation

According to Islam, humans are the most favoured of God's creatures. However, they are responsible for ensuring that nature, God's gift to humanity, is well conserved and taken care of so that it would be equitably available for all on planet Earth. Therefore, the environment must be protected by humans with clear command against upsetting the natural order through pollution or over exploitation. Accordingly, in the Quran, God commands the believers to "make not mischief on earth," i.e. they should not degrade or pollute natural resources. Water conservation in quantity and quality is specifically encouraged within Islamic laws. The Quran tells the believers that they may use God's gifts, such as water, for their basic needs for survival, provided that they do use it in moderation not in excess (Faruqui, 2001).

Among mostly used water conservation tools is the reuse of treated wastewater for irrigation. Treating and reusing wastewater, especially domestic sewage, has many advantages in water management, since they allow the conservation of freshwater for the highest-value uses. Moreover, the reuse of nutrient rich wastewater helps control the environmental impacts of dumping raw sewage in streams and water bodies and enhances agricultural productivity. However, with the utmost importance given to personal cleanliness and public hygiene in Islamic tradition, most Arab societies have been sceptical in their initial response to the idea of wastewater reuse for irrigation. But several "fatwas" have been issued after consulting with scientists and engineers, such as the "fatwa" of the Council of Leading Islamic Scholars in Saudi Arabia for example, stating that treated wastewater can theoretically be used for all purposes as long as it does not pose any health risk to society (Abderrahman, 2000). As a result, treated wastewater reuse for irrigation in GCC countries including Saudi Arabia have been practiced since 1978.

2. Water pricing

In Muslim nations, water pricing is a complicated and disputable since, as mentioned above, the Islamic perception is that water is a common public good which should neither be bought nor sold (Faruqui, 2001). However, according to Kadouri *et al* (2001), most contemporary Islamic scholars have concluded that, in spite of its original nature as a common good, individuals have the right to use, sell, and recover value-added costs of developed infrastructure for water supply services. Accordingly, water resources in Islam are categorized as follows:

- *Public property*, which is water in its original state as a natural resource with free access for all.
- *Restricted private property*, such as lakes and rivers, where owners may have certain rights, but also have obligations (e.g. should not hold back surplus water).
- *Private property*, which is developed through investment in infrastructure works.

Based on the discussion above, in principle it is not against Islamic ethical beliefs to charge a price for water supply. However, it is important to note that within Islam, such prices should be a "fair price" that would lead to greater equity in water use which should be the first consideration in any economic instrument used for water management. Thus water tariffs based on price elasticity of demand are allowed in Islam as they are equitable in principle. On the other hand, cost recovery is also allowed in Islam due to its positive effect on enhancing water conservation and water services for poor communities (Faruqui, 2001). Moreover, since Islam encourages environmental protection, the price can include the cost of wastewater collection and treatment.

3. Privatization

The goal of full cost recovery of water service delivery is best reached through the participation of private partner(s) with the public sector. Islam supports privatization of water supply and sanitation provision in principle as long as it leads to a fair and free market, which results in equitable cost sharing. After all, Prophet Muhammad was a businessman prior to his Prophecy, and he set an example for ethical business dealings. Muslim scholars agree that privatization is allowed within Islam as long as users are served equitably and charged a fair water price.

4. Sectoral allocation

According to Islam, and during the days of the Islamic state, water use was prioritized in order to make the most of available water quantities for the whole population. As such, irrigation was given third priority, behind domestic use and "quenching of thirst" which was assigned the first priority. Consequently, contemporary Islamic scholars consider reallocation of water among sectors and giving priority to basic water needs for life as a necessity that is not in conflict with Islamic belief. Moreover, reallocating water from the agricultural to the domestic sector enhances social justice and equality in water use which are very important in the Muslim faith. These are very important considerations in some countries of the Arab Region in which sectoral reallocation of water has become a dire need.

5. Participation

Contrary to the centralized governance and decision-making systems that exist in most Arab countries, community participation in all public matters such as the management of water resources is mandatory in Islam. In the Quran, believers are defined as those who would, among other things, manage "their affairs by mutual consultation." As such, according to Islam, this consultation is required of all those who are entitled to a voice including women. Therefore, all members of society should be proactive in developing and implementing proper participatory water management schemes. Furthermore, the role of each and every individual in society is important when it comes to spreading awareness for water use and conservation. It should be mentioned here that Muslim clerics have an important role to play with respect to preaching and educating people according to the aforementioned principles of ethical water use (Faruqui, 2001).

Conclusion

As mentioned in earlier sections, efforts for IWRM implementation in the Arab Region have been heavily dominated by neo-liberal policies that are gaining grounds around the globe. Neo-liberal management tools such as decentralization of water resources management, privatization of water services, water pricing reforms aiming at full cost recovery, and sectoral water re-allocation leading to higher efficiency, are all being planned and/or implemented for the water sector in the Arab Region with the presumption that treating water as an economic good and using all these tools for managing water resources improves the overall efficiency in the sector and eventually leads to water conservation and expansion of access to water and sanitation in the Region. However, typical negative impacts of free market-based neo-liberal policies for water resources management, like initial reduction in access to water for poor populations due to their inability to pay for the services, and the consequent increase in poverty level, as well as environmental pollution and degradation, have been well known wherever these policies have been put to work.

Therefore, developing an ethical framework, based on universal human right to water and other global principles of water ethics, to guide the whole implementation process of the above mentioned management tools has become a necessary step for successful transformation toward IWRM adoption in the Arab Region. It is obvious from the previous section that this can be done within predominantly Muslim Arab societies since there is no contradiction between Islamic belief and worldwide accepted ethical standards of integrated water resources management principles which balance equity, efficiency, and sustainability across society. As a matter of fact, one can summarize the Islamic perspective of proper and ethical water management by a single principle, i.e. enhancing equity among water users and justice for all. Therefore, IWRM measures can be implemented in the Arab Region while fully recognizing and adhering to ethical principles of equity, solidarity, and stewardship and respecting the societies' heritage and cultural background.

References

Abderrahman, W (2000) Water Demand Management and Islamic Water Management Principles: A Case Study. *Water Resource Development,* **16** (4): 465-473.

Abdurazzak, M and **Kobeissi, L** (2002), UNDP- ESCWA Initiative on National Framework for Water Resources Management in Lebanon. *In: Proceedings of the 2nd Water Demand Management Forum, Beirut.* IDRC, Canada.

Abu-Zeid, M (2001) Water Pricing in Irrigated Agriculture. *Water Resources Development,* **17** (4): 527-538.

ACSAD (1999) *Evaluation of Present Water Resources Situation in the Arab Region.* Arab Centre for the Study of Arid Zones and Dry Lands, Damascus.

Attia, B (2003) Overview on Decentralization and Participatory Irrigation Management. *In: The Third Water Demand Management Forum, Cairo. IDRC,* Canada.

Bannock, G, Baxter, RE and **Davis, E** (1987) *The Penguin Dictionary of Economics.* Penguin, New York.

Bennett, A (1998) Sustainable public/private partnerships for public service delivery, *Natural Resources Forum,* **22** (3): 193-199.

Berkoff, J (1994) *A Strategy for Managing Water in the Middle East and North Africa.* World Bank, Washington.

Brelet, C (2004) *Some Examples of Best Ethical Practice in Water Use.* UNESCO, Paris.

Budds, J and **McGranahan, G** (2003) Are the debates on water privatization missing the point? Experiences from Africa, Asia and Latin America. *Environment & Urbanization,* **15** (2): 87-113.

Dinar, A and **Subramanian, A** (1997) *Water Pricing Experience.* World Bank Technical Paper No. 386. World Bank, Washington D.C.

Engberg-Pederson, L and **Webster, N** (2002) Introduction to Political Space. *In:* **Webster, N** and **Engberg-Pederson, L (eds.)** *In The Name of the Poor: Contesting Political Space for Poverty Reduction.* Zed Books, London, pp. 1 – 29.

ESCWA (1999) Current Water Policies and Practices in Selected ESCWA Member Countries. ESCWA, United Nations, New York.

ESCWA (2003) Assessment of the Role of the Private Sector in the Development and Management of Water Supply in Selected ESCWA Member Countries. ESCWA, United Nations, New York.

Faruqui, N (2001) Islam and Water Management: Overview and Principles. *In*: **Faruqui, N, Biswas, A** and **Bino, M (eds.)** *Water Management in Islam.* IDRC, Canada, United Nations University Press, pp. 1-32.

Gliek, P (1999) The Human Right to Water. *Water Policy,* **1** (5): 487:503.

Guiterrez, E (2001) Framework document: a survey of the theoretical issues on private sector participation in water and sanitation. Water Aid and Tearfund.

Hardin, G (1968) The Tragedy of the Commons. *Science*, **162** (3859): 1243-1248.

Herromoës, P (2002) Water Ethics – a substitute for over-regulation of a scarce resource. *Water Science & Technology,* **45** (8): 113-124.

Hinrichsen, D (2003) A Human Thirst. *World Watch Magazine,* **16** (1): 12-18.

Johansson, RC, Tsur, Y, Roe, TL, Doukkali, R and **Dinar, A** (2002) Pricing Irrigation Water: A Review of Theory and Practice. *Water Policy*, **4**: 173-199.

Kadouri, MT, Djebbar, Y and **Nehdi, M** (2001) Water Rights and Water Trade: An Islamic Perspective. *In*: **Faruqui, N, Biswas, A** and **Bino, M (eds.)** *Water Management in Islam.* IDRC, Canada, United Nations University Press. pp. 85-93.

Katz, E (1991) Ethics and Philosophy of the Environment: A Brief Review of the Major Literature. E*nvironmental History Review*, **15**: 79-86.

Larson, A (2002) Natural Resources and Decentralisation in Nicaragua: Are Local Governments Up to the Job? *World Development*, **30** (1): 17-31.

Linam, AM (2002) Water Valuation: The Case of Tunis, valuation of drinking water. *In: Proceedings of The Second Water Demand Management Forum,* Beirut. IDRC, Canada.

Lutz, E and **Caldecoff, J** (1996) Decentralisation and Biodiversity Conservation, a World Bank Symposium. The World Bank, Washington.

Naff, T and **Dellapenna, J** (2002) Can there be confluence? A comparative consideration of Western and Islamic fresh water law. *Water Policy*, **4**: 465-489.

Rahaman, MM and **Varis, O** (2003) The Ethics of Water: Some realities and future Challenges.

In: CD Proceedings of 2nd Dubrovnik Conference on sustainable development of energy, water and environment systems, Dubrovnik, Croatia.

Rahnema, M (2002) A Different Look at the "Population Problem". *Population and Environment*, **24** (1): 97-104.

Rees, J (1998) Regulation and private participation in the Water and Sanitation Sector. *Natural Resources Forum*, **22** (2): 95-106.

Rogers, P and **Hall, A** (2003) Effective Water Governance. Technical Advisory Committee Background Paper No.7, Global Water Partnership (GWP), Stockholm.

Rogers, P, Bhatia, R and **Huber, A** (1998) Water as a Social and Economic Good: How to Put the Principle into Practice. Technical Advisory Committee Background Paper No.2, Global Water Partnership, Stockholm.

Selbourne, Lord J (2000) The Ethics of Freshwater Use: A survey. Available at: www.unesco.org/ethics/en/Documents/Publications/wateren.pdf

Simmons, IG (1993) *Interpreting Nature: Cultural Constructions of the Environment.* Routledge, London.

Soussan, J (2004) *Water and Poverty: Fighting Poverty Through Water Management.* Asian Development Bank.

Taha, S and **Bataineh, F** (2002) Water Valuation: The Case of Jordan, valuation of water for domestic use. *In: Proceedings of the 2nd Water Demand Management Forum,* Beirut. IDRC, Canada.

UNDP (2002) Arab Human Development Report 2002: Creating Opportunities for Future Generations. UNDP, Arab Fund for Economic and Social Development, New York.

UNDP (2003) Water Governance and Poverty Reduction. Draft Practice Note for the Bureau for Development Policy, Energy and Environment Group. UNDP, New York.

UNESCO (2003) World Water Assessment Program: Water for People, Water for Life UN World Water Development Report. at: www.unesco.org/water/wwap

UNICEF (1998) *Implementing the 20/20 Initiative: Achieving universal access to basic social services.* UNICEF, New York.

Vasiliev, O (1998) Upstream/downstream Conflicts about Water Resources and Land Use in River Basins: the Need for an Integrated Management Approach. *In: Proceedings of the 8th Stockholm Water Symposium: WATER – the key to socio-economic devel-opment and quality of life,* Stockholm.

WMO (1992) International Conference on Water and the Environment: Development Issues for the 21st Century: The Dublin Statement and Report of the Conference. World Meteorological Organization, Geneva.

Woodhouse, P (2001) Development Policies and Environmental Agendas. *In*: **Kothari, U** and **Minogue, M (eds.)** *Development Theory and Practice: Critical Perspectives, Palgrave, Basingstoke.* pp. 136-156.

World Bank (1997) *World Development Report 1997.* Oxford University Press, New York.

World Bank (2000) *World Development Report 2000: Entering the 21st* Century. Oxford University Press, New York.

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