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SHARED WATER MANAGEMENT: AN ISLAMIC PERSPECTIVE

By
Odeh Al-Jayyousi
And
Murad Bino

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Abstract

This paper aims to present the necessary and sufficient conditions for sustainable shared water management from an Islamic perspective. Water management principles are presented with respect to water sharing, pollution prevention, and cooperation. The paper argues that, with the advances in water technology, the comparative *advantage* of upstream riparian in a river basin is likely to be marginal. The paper recommends the adoption of a regional vision for shared waters in the region. This vision is to be based on a new social contract based on Islamic principles.

1. Background

Water Resources Management (WRM) has become a complex multidisciplinary activity due to the change of water use patterns, concern for the environment, and the possible impacts of a global climate change. Utilization of water resources may change natural systems and thus is bound to have an ecological impact. This in turn may have far reaching consequences, not only on for the integrity of the ecosystem, but ultimately for the sustainability of economic development.

WRM is defined as the care for the surface water and groundwater, taking into account all interests involved. Recently, sustainability as an objective was introduced in WRM. Which means meeting today's needs, without compromising the ability of future generations to meet their own needs. A Water Resource System (WRS) consists of three components. These include:

1. Natural resources (both natural and man-made) which includes rivers, lakes, groundwater aquifers and infrastructure required to use the water resources.
2. The socio-economic system, which includes the water use patterns and water-related human activities.
3. The administrative and institutional system, which includes the authorities responsible for the management of WRS. It is also concerned with implementation of laws and regulations.

With increasing population and economic growth, the demands on the functions of WRS increase at an alarming rate. Conflicts are likely to arise regarding which sector or riparian will be allocated an "equitable" and "reasonable" water share. Competition between users or riparian states occurs due to a gap between water supply and demand. Hence, WRM is required to allocate scarce resources among various competing uses and/or users. One critical role that WRM plays is that it aims to optimize the performance of WRS and to satisfy the socio-economic and ecological requirements in a sustainable manner.

Water resources are common property resources with an open access character. Since people cannot be excluded from using the resources, these resources are characterized as public goods. Hence, water resources should not be considered a free access common property and should be allocated to the most appropriate users based on the concept of sustainable development and equity.

In the last two decades, the need for new approaches to the assessment, development and management of freshwater resources was realized in various global meetings. As defined by the UNDP (1990), integrated water resources management is based on the perception of water as an integral part of ecosystem, a natural resource and social and economic good. The January 1992 International Conference on Water and the Environment: Development Issues for the 21st Century, held in Dublin, Ireland, called for new approaches to the assessment, development, and management of fresh water resources. Moreover, in June 1992, the United Nations Conference on Environment and Development in Rio Janeiro, Brazil, confirmed the widespread consensus that the management of water resources needs to be reformed. The conference stated that:

"The holistic management of freshwater as a finite and vulnerable resource, and the integration of sectoral water plans and programs within the framework of national economic and social policy, are of paramount importance for actions in the 1990's and beyond."

Necessary conditions for the success of these approaches include: public awareness campaigns, legislative and institutional changes, technology development, and capacity building programs. Underlying all of these must be a greater recognition of the interdependence of all peoples, their norms and values, and of their place in the natural world. The Islamic perspective towards both man and nature provides a conceptual framework for sustainable resource management. This paper aims to shed some light on the relevance between Dublin statements and Islamic principles.

With increasing population and economic growth, the demands on the functions of water resources system (WRS) increase at an alarming rate. Conflicts are likely to arise regarding which sector or riparian will be allocated an "equitable" and "reasonable" water share. Competition between users or riparians occurs due to a gap between water supply and demand. Water resources management (WRM) is then required to allocate scarce resources among various competing uses and/or users. One critical role that WRM plays is that it aims to optimize the performance of the WRS and to satisfy the socio-economic and ecological requirements in a sustainable manner.

Water issues are linked to scarcity, maldistribution, and sharing. The development and management of regional water resources in the Middle East region presents a challenge for water managers and experts.

The ESCWA region is a good example of an area facing relatively acute water shortages. About 500 cubic meters of water per year ($m^3/yr.$), or somewhat more than 100 liters per day, are needed by each person for an adequate existence, although the United Nations and others sometimes use 1,000 m^3/yr as more acceptable for modern life. In 1990, the per capita availability of water from existing national sources in Jordan 260, in the Yemens 240, in the U.A.E. 190, and in Saudi Arabia 160 (Gleick, 1991).

Besides scarcity and maldistribution, the third basic aspect of water as a resource is that it crosses national boundaries. More than two hundred rivers in the world are shared by two or more nations. In the Middle East, the Tigris and the Euphrates cross three nations, the Orontes (Asi) also directly involves three, as does the Jordan, while the Nile basin includes nine diverse nation states.

Thus, if we consider the combination of these major features of water as a resource (scarcity, maldistribution, and sharing), one outstanding implication emerges- the great need for cooperation among national riparian states, indeed even among groups within nation states.

The significance of this paper stems from the fact that future options for water management in the region include the development and management of shared water resources. These options must meet specific conditions with regard to building consensus on basic assumptions, procedures, benefits and externalities of future regional projects in the region. The paper will address these aspects along with identifying relevant Islamic laws and principles to establish binding agreements among riparian states.

A review of relevant literature from various fields of knowledge (politics, economics, law) for the management of shared water resources will be presented. For example, in light of political theory, the formation of "institutions" was introduced as a solution for the *tragedy of commons*. Economics helped us identify the problem of *scarcity* and the *tragedy of commons*. Political and institutional theory developed a framework to address these problems. Vincent and Elinor Ostrom (Butrico et al. 1971) developed a political theory for institutional analysis for common pool resources.

Political theory provides various models and paradigms to understand the management of shared water resources and water conflicts. One modeling approach that has sometimes been applied to water crises is game theory. It is described by Frey (1993) that riparians are assumed to be playing a non cooperative game in which they know the strategies and payoffs of all other parties and try to determine a rational, cost-benefit strategy for themselves, assuming the others are committed to their respective choices. Under such conditions, game theory suggests likely outcomes.

Modeling of transnational river situations in terms of optimal environmental analysis also has been suggested (Dormfman, 1972). These models use the fundamental economic notion of optimality to establish criteria that solutions to water conflicts should meet the criteria for equity (and thus for cooperation). *It*

assumes that each riparian can identify its benefits under any proposed basin plan, and that each nation is trying to maximize those net benefits. Any plan that, compared with some other plan, does not reduce any nation's net benefits and increases at least some nation's net benefits is superior. A plan is Pareto admissible if there is no other plan that is, in this sense, superior to it.

Another set of models applied to transnational river basin conflicts relates to negotiation and conflict management. These models, such as Alternative Dispute Resolution (ADR) and Process of International Negotiation (PIN), portray constructive approaches to negotiation, serving as a template for negotiating success rather than as a predictive model of actual conflict processes or outcomes (Potapchuk, 1990). They concentrate on identifying the interests (values and goals) of each party to the conflict and use a collaborative search to find a solution that maximally satisfies each actors interests.

A related approach to resolving conflicts over transnational water resources employs the systematic evaluation of alternatives in the Multi-Attribute Tradeoff System (MATS) of the U.S. Department of the Interior and similar computer packages (Smith, 1990). All of the above approaches, along with other models, will be evaluated with respect to Islamic Water Management (IWM) and shared water treaties.

It is believed that unless water and land resources are managed more effectively in the present decade and beyond. Then, human health and welfare, food security, industrial development and the ecosystems on which they depend, are all at risk. To achieve sustainable water management, new approaches to the assessment, development and management of freshwater resources are needed. Commitment will need to be backed by substantial and immediate investments, local norms, public awareness campaigns, legislative and institutional changes, technology development, and capacity building programs.

Sharing waters among riparian states offers both opportunities and constraints in water management. The subject matter, shared water management, is multi-disciplinary. Moreover, due to globalization, information technology, and progress in water technology, the concepts and practice of water management may experience some drastic changes or paradigm shifts. In brief, from a global perspective, “**we all live downstream**” is a defensible argument. Management of shared waters deals with the following fundamental questions:

1. Who gets what and why? This is an **equity** question.
2. Who (and how much) should a riparian pay for water pollution? This is a question related to **environmental justice and economics**.
3. How can we enhance information sharing among riparian states? This is a question of **water security**.

This paper intends to address the above three issues; i.e. , equity, justice, and security from an Islamic point of view.

2. Islamic Perspective

Islamic thought looks upon the challenges of the twenty first century as a crisis of values. It realizes the need to re-examine foundations on which the entire structure of society is built. The crisis in economic and political relations is the natural outcomes of values and institutions that characterize modern civilization. It is believed that through a thorough understanding of the social values of Islam, value-oriented communities can develop a creative and innovative approach to the challenges confronting humanity today. The message is timeless and the principles Islam embodies are of universal application.

Islam covers all aspects of human life. It regulates the relationships between God, Man, and Nature. It is based on the recognition of the unity of the Creator and of man's submission to His will. Everything originates from the One God, and everyone is responsible to Him. Man is viewed as a trustee (*khalifah*) and a witness (*shahed*). His role and responsibility is to ensure that all resources, including water, are utilized in a reasonable, equitable, and sustainable manner.

Islam advocates the notion that nature is created by God (*Allah*) for the benefit of Man. The relationship between Man and Nature is based on harmony, since all creatures obey the laws (*sunan*) of God. Man is urged to explore and utilize the natural resources in a sustainable manner. It is through submission to the Will of God that peace is brought about. Harmonization of man's will with the Will of God leads to responsible and balanced life. Every human activity is given a transcendent dimension; it becomes sacred, meaningful, and goal-centered.

Some basic Islamic principles are fixed, and others may change in response to changing conditions. This implies that the general framework and guiding principles are defined, but the specific details and applications may vary to respond to the changing needs of life. In Islam, the main source of ruling is jurisprudence (*shari'a*), which is based on Quran (*revelation*) and Prophet Mohammad's (pbuh) sayings and acts (*sunnah*). These sources of passing judgments are by no means exhaustive. A fundamental source for devising rulings is called innovation (*ijtihad*). It means the strive to develop new laws, rules, and judgments due to changing conditions.

The Quran is the revelation of God, the central fact of the Islamic religious experience. Quran represents the Divine Will which man has to follow. This is evident in many verses in Quran, for example:

"Here is a plain statement to men, a guidance and instruction to those who fear God" (Ali-Imran 3: 138).

Thus, the primary material source of the revealed law and knowledge is *Quran*, the sourcebook of Islamic values. While the *Quran* does contain prescriptions about matters that would rank as legal in the strict sense of the term, these injunctions comprise eighty verses. The bulk of *Quranic* matter consists mainly of broad, general moral directives as to what the aims and aspirations of Muslims should be.

Sunnah of the Prophet (pbuh) consists quite simply of in the normative model behavior of the Prophet (pbuh). The importance of the *Sunnah* of the Prophet (pbuh) is rooted in the *Quranic* command to obey and follow the Prophet (pbuh). *Sunnah* is divided into three categories: (1) Prophet's statements (pbuh) and sayings; (2) his deeds; and (3) his tacit approval of deeds which he had experienced or he has knowledge of. The *hadiths* were evaluated and documented through a well-structured methodology which produced the new Muslim science of *hadith* criticism (*mustalah al-hadith*).

The philosophy of developing new laws and rules in Islam is based on assimilation by *innovation* and *selective imitation* from the accumulated knowledge of all mankind. The task of the Muslims in every generation must be to exercise innovative solutions to reaffirm and rediscover Islamic rules and apply them through legislative consensus. The basic methods of understanding, interpreting, and devising new rules (after *Quran* and *hadith*) are through the following tools. These include:

1. Analogy or relevance (*qiyas*): Islamic scholars are entitled to pass judgments for new events or issues by making analogies from historical incidences through personal reasoning and interpretation.
2. Unanimous agreement of the jurists (*ijma*): *Ijma* refers either to the consensus of the whole community or the consensus of the religious authorities regarding interpretation of a *Quranic* text or tradition, or a development of legal principle. The general consensus of Muslim jurists (*faqih*) has always been that the *Sharia* is concerned with human welfare and based upon justice and equity.
3. Juristic preference (*istihsan*): In cases where no ruling exists, judgments may be based on the common preference of jurists (*Hanafi* school).
4. Public interest or human welfare (*maslaha*): If none of the above means of passing judgment exist, then the collective benefit of society or public interest is considered as a means to devise new rulings (*Maliki* school).
5. Continuance or permanence (*istishab*): It is the principle of equity most often associated with the school of *Shafi'i* and *Hanbali*. The term refers to the presumption in the law that conditions known to exist in the past continue to exist or remain valid until proven otherwise.

According to the classical legal theory in Islam, four sources of jurisprudence were employed: The *Quran*, *Sunnah*, *qiyas*, and *ijma*. Laws were derived from the revealed texts of the *Quran* and the *Sunnah*, or from the product of the jurists' analogical reasoning based upon the texts. The authority for their interpretations came from what was considered the infallible *ijma* of the scholars. There was recognition within the schools themselves of subsidiary principles of equity previously described (*istihsan*, *istislah*, and *istishab*).

However, due to many factors, the continued dynamism of legal development after the tenth century were stifled. A series of events were to gradually stop this creative process: "the closing of the door of *ijtihad*," growing political decay, assimilated customs contrary to *Quranic* spirit, and finally the Mongol invasions of the thirteenth century. All played a part in halting creative legal activity.

The scheme of life, which Islam envisages, consists of a set of rights and obligations. Everyone who accepts the religion is enjoined to live up to them. Broadly speaking, the law of Islam imposes four types of rights and obligations on every man: (i) the rights of God; (ii) his/her own rights upon his/her own self; (iii) the rights of other people over him; (iv) the rights of those resources which God has empowered him to use for his/her benefit.

God has honored man with authority over His countless creatures. Everything has been harnessed for him. He has been endowed with the power to subdue them and make them serve his objectives. This superior position gives man authority over resources, including water. However, this authority is guided by a sense of responsibility and accountability towards both creatures and nature. Man should not waste resources on fruitless ventures nor should he unnecessarily hurt them or harm them. When man utilizes resources for his service. He should cause them the least possible harm, and should employ the best and the least injurious methods of using them.

Islam does not approve the useless cutting of trees and bushes. Man can use their fruits but he has not the right to destroy them. Nor does Islam allow waste among even lifeless things; so much it disapproves of wasteful use of water, even there is no scarcity of water. Its vowed purpose is to avoid waste in every conceivable form and to make the best use of all resources.

Man has been endowed with countless powers and faculties. He possesses intellect and wisdom to achieve the balance in this Universe. His very life and success depend on the proper use of these powers. God has also provided man with all those means and resources to make his natural faculties function and to achieve the fulfillment of his needs. The environment and surroundings contain resources that are harnessed for Man. Human beings should cooperate and exchange knowledge (*Hikmah*) to establish a better and prosperous life. The proper use of Man's powers implies the attainment of benefits to public. Every other use of resources which results in waste or destruction is wrong and unreasonable.

If Man's actions harm others or make nuisance to them, this means a misuse of God-given powers. The Shari'ah stipulates the law of God and provides guidance for the regulation of life in the best interest of Man. Its objective is to show the best way to man and provide him with the means to fulfill his needs in the most beneficial ways. To achieve this goal, there should be mutual assistance and cooperation among human beings. Sources of human knowledge are too limited to provide him with the unalloyed truth. That is why God has spared Man the risks of trial; and error and revealed to him the Law which is the right and complete code of life for the entire man race (Mawdudi, 1987). However, Islam regards knowledge and science as the common heritage of mankind. Muslims have absolute liberty to learn them and their practical uses from whatever sources they can.

In light of the above, a summary of the main Islamic guiding principles and axioms with reference to resource management, Islamic Water Management (IWM), and the utilization of knowledge are outlined as follows:

1. **Assimilation of knowledge (*Hikma*):** Islam adopts the notion that knowledge and wisdom is of universal nature. Members of the Muslim community are encouraged to utilize and benefit from the accumulated experiences of other nations. This broad guideline can also be applied to water

management. The Prophet (pbuh) declared: *"Wisdom is sought by a believer, where ever he finds it, he makes use of it"* (Al-Termithi, section of knowledge "Ilm").

2. **Quality of performance:** Islam urges believers to perfect their deeds and to be kind and merciful to other creatures (including animals and natural resources). It was stated by the Prophet (pbuh) that: *"God has mandated to practice the best and quality deeds (ihsan) on everything..."*. (Cited by Muslim, No.17, Readers of Sciences and Wisdom, p.141, Al-Baghdadi).
3. **Conservation:** It was stated in both Quran and Hadith that waste in all forms is not acceptable. The Prophet (pbuh) ordered not to waste water even when washing (abulotion) for prayers. The Quran says: "...But waste not by excess: for Allah loveth not the wasters" (Al-Ana'm, 6:141).
4. **Water is a public good:** Islam views water as a common-pool resource or a public good (like lakes and rivers) that is owned by community. The Prophet (pbuh) declared that free access to water is the right to the Muslim community (Caponera, 1992). The Prophet (pbuh) stated: "Muslims are partners in three resources: water, pasture, and fire". (Ibn Majah after Ibn Abbas, from Zuhaily, 1989).

Social responsibility: Caring and sharing the community's concerns are emphasized in Islam. Members of the society, are urged to be concerned about public affairs and issues. They should conduct consultations in all matters. These cover a wide array of civic life and resource management aspects. The Prophet (pbuh) stated:

"He, who does not care about Muslims' affairs, is not part of them". (Al-Bayhaqi, Kitab Al-Shua'ab, after Annes).

A summary of the legal framework for water, from the Islamic perspective, was presented by Allan and Mallat (1995). The core principles of Islamic water law can be outlined as follows:

- i) Water is a gift of God, and belongs in principle to the community. This creates a primary right of *shafa* (drink) for an individual and for cattle and household animals.
- ii) Value added to water by labor in the form of retaining it in a recipient and/or through distribution or conservation works may create a qualified right for ownership.
- iii) Water sharing principles vary according to local uses, but the general trend is the acknowledgement of a right of prior appropriation combined with the required distribution of the surplus.
- iv) Liability attaches to withholding or misuse of water, including for polluting or degrading clean water.

The IWM concepts and principles mentioned above will be compared with the Dublin Statement. Citations from Quran, Hadith, and other accepted sources will be stated to show how IWM agrees or departs from Dublin Statement.

Various verses in Quran illustrated the value of water, how was it formed, and its vulnerability. The following are some selected examples:

"We made from water every living thing. Will they not then believe" (Al-Anbia', 21:30)

"And Allah had created every animal from water" (Al-Nur, 24:45)

"Say: If your stream be some morning lost (in the underground earth), who then can supply you with clear flowing water?" (Al-Mulk, 67:30)

The concept of community participation and consensus building is well established in IWM. Quran urges that decision making must be based on consultation, group decision making and consensus (*shura*). In the holy Quran, in the context of describing believers, it is stated:

"...those who harden to their lord, establish regular prayer; and who conduct their affairs by mutual consultation" (Al-Shura, 42:38)

The Prophet (pbuh) practiced consultations and accepted advice in many cases. The selection of site in Bader near sources of water was suggested by on companion, Habbab Ibn Al-Munther.

The participatory approach involves raising awareness of the importance of water among policy-makers and the general public. It means that decisions are taken at the lowest appropriate level, with full public consultation and involvement of users in the planning and implementation of water projects.

Islam declares that responsibility for taking care of all resources is not linked with gender. In IWM, both men and women are considered as "care-takers" of resources. Each has a social responsibility to conserve water and prevent water pollution. Civil society is characterized by the involvement of public in all affairs. This can be applied through the establishment of Water Users Associations (WUA) or other non-governmental organizations (NGO's). They can play a role in adjusting, modifying and/or enacting laws and regulations, which are consistent with sustainable water management. Islam urges all members of society to take an active and positive attitude towards public concerns. This involvement should be performed through effective communication and consultation.

The fundamentals of Islamic water law purport to ensure that water is available to all members of Muslim community. This is why in many modern Muslim countries water legislation considers water resources are belonging to the whole community, i.e., the state or the public domain (Caponera, 1992).

Prophet (pbuh) declared that water should be, together with pasture and fire, the common entitlement of all Muslims. Based on this notion, public waters (lakes, rivers) are not salable. Free access to water is the right of the community.

The legal status of water was defined in Mejelle Code. In article 1234 of the code, water is defined as a non-saleable commodity to which everyone has a right. Groundwaters as well belong to the community (Article 1235). Water rights and water priority allocation have been regulated in detail. These include: (i) the right of thirst (domestic and livestock), (ii) the right of irrigation.

A distinction must be made with regards to private waters. These include waters contained in wells, tanks, and other reservoirs. If an additional cost is spent to convey, treat and store water, then it is considered a private ownership (Zuhaily, 1989). This implies that water users have to pay the cost of operation, treatment, and maintenance. Special consideration must be paid to low income users who do not have the ability to pay. For some users, water should be subsidized.

Moreover, as documented by Schacht (1964), the origin of the provisions of Islamic law concerning rights in water must be looked for not in Arabia, where there are no perennial streams, but in Iraq, a country of artificial irrigation from time immemorial. Big rivers, such as the Euphrates and the Tigris, are not private property; small watercourses and canals are the joint property of the owners of the adjoining land.

The right to use water can be separated from the land to which it belongs, not by sale but by legacy. Although the water in such a canal is privately owned, every one has the right to drink from it, but he must not trespass on the land of another without the permission of the owner, except in a case of necessity. Full private property in water exists only if it is in custody, i.e., in a container.

3. The Question Of Equity and Water Security

The international law principles, as a means to manage shared water resources will be presented, analyzed, and compared with respect to IWM principles. Traditionally four theories governing the use of international rivers exist in the literature (Utton and Teclaff, 1978, p. 154):

1. **Harmon Doctrine**, which advocates absolute sovereignty to upper riparian states.
2. **Absolute Territorial Integrity**, which guarantees to the lower riparian the use of the river in an unaltered state.
3. **Drainage Basin Development** or the **Community Theory**, which stresses mutual development of a river's waters by all riparian states.

4. **The Restricted Territorial Sovereignty or Equitable Utilization Theory**, which permits use of a river's waters to the extent of doing no harm to other riparian countries.

Due to the specific characteristics of each international rivers in terms of the hydrologic, institutional and legal aspects, it is not realistic to draw up rules and regulations of universal applicability unless they are kept broad and flexible. However, the Islamic water laws in terms of ownership of water, speculation, and precedence (allocation) rules will be discussed and compared with international law principles.

Historically, the elaboration on such a set of principles had undergone through an evolutionary process. The International law Association (ILA) has formulated the Helsinki Rules in 1966. Since 1971, the International Law Commission (ILC) of the United Nations (U.N) has been working on comprehensive principles (which are currently in the form of 33 draft articles) on the law of the non-navigational uses of international watercourses.

The main concepts and principles included in the ILC articles may be summarized as follows:

- i) The articles aimed to achieve a balance between the “equitable and reasonable” utilization of an international river (Art. 5) on the one hand, and the desirability to of avoiding “significant harm” to the other riparians that are already using the river (Art. 7), or might want to use it in the future, on the other hand. However, the ILC made it clear that it regards “equitable and reasonable” as the guiding criterion.
- ii) Relevant factors are to considered in determining whether any use of the river is “equitable and reasonable”. However, no attempt was made to order these factors in terms of priority due to the relative importance of these factors from one country to another.
- iii) The articles oblige riparian states to co-operate in the optimal utilization and protection of the rivers which they share (Art. 8).

Managing shared water resources should take into consideration many factors which include current laws, institutional settings, and present and future water resources and uses.

In international law, there is no accepted definition of equity. However, the Helsinki Rules on the Uses of the Water of International Rivers identified several factors thought to have bearing upon equity. These factors should be taken into account when determining a reasonable share of basin waters for each basin state. These factors include climate, water availability, and water demand. Under the Helsinki Rules, there is no one factor upon which an allocation regime should be based; indeed, the Helsinki approach specifies that weighted consideration must be given to all relevant factors:

As stated by Hayton and Utton (1989), the weight to be given to each factor is to be determined by its importance in comparison with that of other relevant factors. In determining what is a **reasonable and equitable** share, all relevant factors are to be determined together and a conclusion reached on the basis of the whole.

It can be argued that due to the advances in water technology, the comparative advantage of upstream riparian in a river basin is likely to be marginal. This is attributed the fact that water supply augmentation by non conventional resources will shift the relative power among states.

This implies that factors identified by the Helsinki Rules must be operationalized; i.e., to be able to represent these rules in a quantifiable manner. Moreover, an effort should be made to translate these legal provisions into practical allocation regimes; i.e., to be able to derive criteria or standards for the allocation of shared water resources between riparian states. Mechanisms to operationalize the various factors in shared water management will be addressed in terms of IWM principles.

There is an emerging tendency to shift the focus from national to human security in the reflection of the of the growing realization that the actual personal security of the individual and the local community is as importance as the security of the state.

In providing food, sanitation, and possibilities for development, water is an essential component to the realization of social security. Good international practices can be crucial for the security of whole region, to avoid the process of exploitation, injustice through the maintenance of interdependent systems of sustainable water management. Stability and cooperation regarding water can help attract investment and growth in a region. Lack of water security has the opposite effect, thus adding to the problems of poverty and instability.

If states start running out of water before coming to arrangements of how to share and to protect the international water courses this could lead to completion rather than responsible cooperation. Building up sustainable practices, encouraging the perception of water as a shared and unify resource, and promotion mutually beneficial solutions to water problems before they come out of control (Green Cross International, 2000).

Hence, the adoption and enforcement of Islamic water laws, norms and values is likely to enhance the likelihood of making such water agreements binding.

The water security has relevance in the Islamic teachings. This illustrated in more than one reference in the Quran. For example, Islam teaches that there is correlation between faith and attaining and maintaining security. "Refer to Al Anam, 6: 82"

Moreover, the Islamic teachings convey the notion that blessings of the bounties of nature are granted to those who are good believers.

4. The Question Of Environmental Justice

The word environment in Arabic means "*bi-a*" and has its roots from the word "*ba-a*" meaning container or home. In this sense environment in Arabic means the container of life. As in Christianity and Judaism, in Islam humankind has the first right to the resources that God has provided his creation. It is well accepted by Islamic scholars (Mallat 1995, 129) that the priority of water-use rights is: first, *haq al shafa* or (*shirb*) the law of thirst or the right to quench thirst for humans; second, *haq al shafa* right for cattle and household animals; and, third the right of irrigation. However, the environment has clear and unmistakable rights in Islam.

God informs human beings of the rights of animals by comparing them (animals) to humans:

"There is not an animal (that lives) on the earth, nor a being that flies on its wings, but (forms part of) communities like you." Al-Anam, 6: 38

Animals cannot be allowed to die of thirst, and the water that remains after humans have quenched their thirst must be given to them. The Prophet (pbuh) said, "*there is a reward for serving any animate (living being),*" and "*He who digs a well in the desert ... cannot prevent the animals from slaking their thirst at this well.*" (Al-Bukhari. 8. 38). The immense value of giving water to any creature is reflected by the following *hadith*: "*A prostitute was forgiven by Allah, because, passing by a panting dog near a well and seeing that the dog was about to die of thirst, she took off her shoe, and tying it with her head-cover she drew out some water for it. So, Allah forgave her because of that.*" (Al-Bukhari. . 538).

The *Quran* notes that the gift of water is for flora as well: "*vegetation of all kinds*" Al- Anam, 6 : 99 , and "*various colours*" *Fatir*, 35 : 77, are nourished by rainwater that God sends down. These verses support the statement that water is made available by God so that all life should receive support according to its needs, including humans, animals and plants. Non-human species have rights to sufficient water that is of "good" quality because the water has to be suitable for "nourishing vegetation" and for drinking by animals.

Islam has numerous references and injunctions that regulate human-environment interactions. Specifically, it was shown that Islam requires its adherents to conserve water, consider the water needs of non-human species, and not to irreparably degrade water and other natural resources.

The concept of preventing harm and injury to others in a community is forbidden. The *Hadith* says that: “*Don’t commit any harm or injury to yourself and not to cause harm or injury to others*”. (Al Baghdadi, 1982).

The implication of this concept has significant implication on environmental management systems. Islam adopts the notion that emphasis should be shifted from “the polluter pays principle” to the “pollution prevention pays off”. It also urges for the adherence to economic incentives rather than sanctions in environmental management and pollution prevention and control.

5. Conclusions and Recommendations

Islam presents a reference and code of conduct for man towards resource management. Man is viewed as a trustee (*khalifah*). His role and responsibility is to ensure that all resources, including water, are utilized in a reasonable, equitable, and sustainable manner. Islam adopts the notion that knowledge and wisdom (*hikmah*) is of universal nature. Members of the Muslim community are encouraged to utilize and benefit from the accumulated experiences of other nations.

It is recommended to adopt a regional vision for shared waters in the region. This vision should be based on a new social contract based on Islamic principles. The analogy of this regional cooperation among states is best explained by the case of the Higzi Rail Road that existed at the turn of the last century. The vision sees that if we can transport goods by a high speed train among states, this will establish multiple of win-win scenarios and interdependencies. If we can imagine that this infra structure is a regional water carrier supplied by different types of water- conventional and non conventional, then the regional water deficient will be managed at a regional level. This vision might look simplistic and idealistic or ambitious, but establishing a regional infrastructure is a prerequisite for a water security in the region.

The participatory approach involves raising awareness of the importance of water among policy-makers and the general public. It means that decisions are taken at the lowest appropriate level, with full public consultation and involvement of users in the planning and implementation of water projects.

Policy changes and planned actions are needed to reverse the present trends of over-consumption, pollution, and unsustainable water management. Interdisciplinary research is recommended to explore possible avenues of IWM. Research on Islamization of water-related knowledge is an effort that should be pursued and supported.

Role of women in water education should be enhanced through both formal and informal mechanisms. Research on the reform of the domain of women’s role in the society is needed. Involvement of women in Water Users Associations (WUA) and other NGO’s must be supported.

To operationalize IWM principles, a consultative council for sustainable water management and law reform is recommended. This council should be represented by scholars in both science and religion to ensure interdisciplinary learning and help promote innovation (*ijtihad*). One major task of this council is to formulate both national and international Islamic water policy. An evaluation of the performance of this council and dissemination of new rulings (*fatwa*) should be accessible to public.

Policy makers can tap into Muslims’ religiosity and desire for salvation to design Islamically-inspired water and environment management strategies.

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