

ORIGINAL ARTICLE

Sustainable Development: Islamic Dimension with Special Reference to Conservation of the Environment

¹Abdul Haseeb Ansari, ²Parveen Jamal, ³Umar A. Oseni

¹Professor, Ahmad Ibrahim Faculty of Laws (AIKOL), International Islamic University Malaysia (IIUM), Malaysia.

²Associate Professor, Bioprocess and Molecular Engineering Research Unit (BPMERU), Department of Biotechnology Engineering, Faculty of Engineering, International Islamic University Malaysia (IIUM), Malaysia.

³Visiting Fellow, Islamic Legal Studies Program, Harvard Law School, USA.

Abdul Haseeb Ansari, Parveen Jamal, Umar A. Oseni: Sustainable Development: Islamic Dimension with Special Reference to Conservation of the Environment

ABSTRACT

Sustainable development is a *sine qua non* for conservation of the environment and protection of lives of all living creatures on the earth, including the human mass. This was realized after a considerable loss and sufferance. Allah (s.w.t.) created all components of the environment in a definite proportion with particular tasks assigned to them, and ordained us to maintain that ratio. Disturbing them is considered as a misdeed (*fasad*), and Allah (s.w.t.) does not like it. The idea of sustainable development is already there in Islam, in the concepts of vicegerency (*khalifah*) Islamic brotherhood (*ukhuwwah*), trust (*amanah*), public interest (*maslahah mursalah*), prevention from bad (*sadd al-dhari'ah*). The purpose of writing this paper is to pursue an expository study in order to depict the existence of the sustainable development imperative in Islamic injunctions so that it could be an instrument along with other measures for abatement and control of environment degradation and consequential loss due to that.

Key words: Sustainable development, Environment, Genetic modification, Waste management

Introduction

The need to establish a sustainable world through the sustainable use and conservation of resources has continuously been emphasised by different stakeholders in order to resources be effectively utilised by the present generation without compromising with the needs of future generations. The socio-economic and environmental aspects of sustainable development are areas of paramount concern, which everybody must seek to understand and internalize. More importantly is the environmental aspect of sustainable development, which invariably ameliorates the condition of the environment and everyone's wellbeing in the society. So, the need to conserve the environment in line with established sustainable imperatives must always be a priority. Initial efforts to define what constitutes sustainable development were undertaken by the 1987 Brundtland Commission Report, which took a dramatic step that ushered the whole world in a sustainable direction. The whole Report of the Commission is summarised in the definition of sustainable development. The report defines sustainable development as: "development that meets the needs of the present without compromising the ability of future generations to meet their own needs. The Brundtland report laid down the groundwork for future engagements towards the development of a sustainable world. Barely five years after the Brundtland Report, the Rio Conference in Brazil further reaffirmed this commitment to have sustainable world where: "human beings are at the centre of concerns for sustainable development. They are entitled to healthy and productive life in harmony with the nature." This was the outcome of the comprehensive blueprint for immediate action by all stakeholders globally and locally to promote a sustainable environment for sustainable development.

The elements of sustainable development are economic, environmental and social which collectively serve as a bridge that connects economics, ecology, religions and ethics. Though a holistic approach is required in tackling the age-long challenges of sustainability, one important element that requires more attention, due to its indispensable nature in other elements, is conservation of the environment.

This is further justified by the fact that "... by 2010, the word 'sustainability' now often supplants the antecedent term of 'sustainable development', subtly signalling that sustainability implies something more than traditional notions of development, where the focus, however much concepts of environment and society were included, always seemed to veer toward the achievement of economic prosperity" (Scarlet, 2010). Once effective measures to secure a sustainable environment are put in place, other elements will naturally come in order because they are interdependent, co-extensive and co-existent. Even though the UN plans to hold another significant Conference on Sustainable Development in 2012 in Rio de Janeiro to address a number of challenges facing the implementation of agreed commitments, the issue of enforcement has continued to appear in most of its agenda (Martine, 2010). A comprehensive approach is required to tackle the earth-shattering challenges of sustainable development. The solution lies in putting in place an effective environmental enforcement regime and generating awareness among the people.

Against the above backdrop, this paper examines sustainable development from the Islamic perspective with special reference to the need to conserve the environment for the benefit of all. Series of research have been conducted on the Islamic approach to sustainable development. But there is a need to examine the specifics of sustainable development and conservation of the environment from the Islamic and ethical perspectives (Roughten, 2003). Besides reviewing the affirmative evidences, which are important, on sustainable development in Islam and from the ethical perspective, there is a need to shed some light on modern trends on the conservation of the environment through the promotion of sustainable development. It is pertinent to emphasise that the Islamic approach to sustainable development should be considered in making policy reforms, particularly in addressing the bemoaning challenge of enforcement. In order to address this, series of steps have been taken in the past to drive in the Islamic approach to foster sustainable development. The initial efforts of the participants at the International Environment Forum from an Islamic Perspective in Jeddah in 2000 - This was the original draft of the first Islamic statement on sustainable development and the environment. This conference was held in Jeddah, Saudi Arabia from 23-25 October 2000. The principal objective of the conference was to explain to non-Muslims the age-long tradition of Islam on the conservation of the environment through divinely inspired concepts of sustainability. The conference was jointly organised by the Organisation of Islamic Conference (OIC), the United Nations Environment Programme (UNEP) and the Meteorology and Environment Protection Department of the Kingdom of Saudi Arabia. The views presented by experts and scholars on various aspects of environment and development brought about the Jeddah Environment Declaration from an Islamic Perspective.) - have snowballed into the Islamic Declaration on Sustainable Development (hereinafter called 'Islamic Declaration') which was included in the papers presented at the UN World Summit on Development in Johannesburg in 2002. It is notable that at this summit the Jeddah Declaration was presented which was earlier adopted by the Organisation of Islamic Conference (OIC). It was formally presented at World Summit in Johannesburg as the "General Framework of Islamic Agenda for Sustainable Development". The World Summit was held from 26 August to 4 September 2002.

The Islamic Declaration is built on the underlying principles of conservation of environment in Islam. It covers aspects of economic growth, poverty alleviation, population and urban development, health and environment, natural resources, world trade and globalisation, legal and institutional aspects of environment, involvement of civil society, awareness, achieving peace and security, and funding. With a total number of seven Articles, the Islamic Declaration reemphasised the age-long commitment of Islam to the conservation of environment through sustainable development. What is required is a comprehensive approach which integrates the environmental, social and economic dimensions of sustainable development with clear commitments that must be enforced through joint efforts securing our common future. Islam and its ideals have a lot to offer to provide the necessary way forward towards enforcing commitments of various countries across the world (Muyibi, 2005).

This paper dilates on the Islamic perspective to sustainable development with special emphasis to conservation of environment. Section II gives comparative perspectives of the essential features of sustainable development with an analysis of the three dimensions – environmental economic and social. Section III examines the dynamics of environment and development from the Islamic perspective. More so, Sections IV and V discuss the Islamic perspectives of genetic modification and waste management respectively. The paper concludes that the Islamic approach to sustainable development adopts a comprehensive approach which covers the three dimensions. The Rio conference in 2012 will certainly have a lot to learn from the Islamic approach to overcome the challenges of enforcement and lack of comprehensiveness [24]. In order facilitate that, the paper discusses some of the pertinent issues from the Islamic perspective.

Essential Features of Sustainable Development:

In understanding the concept of sustainable development from the Islamic perspective, it is pertinent to examine the essential features, which are commonly known as the environmental, economic and social dimensions of sustainable development. A close study of concepts in the Qur'an and *Sunnah* reveals numerous

definitive divine injunctions (*nusus*) that emphasise on conservation of the environment and the role of mankind in achieving it. The three dimensions of sustainable development are comprehensively addressed in the primary sources of Islamic law. They are considered interdependent, as any of them cannot be completely bifurcated from others. A holistic approach to sustainable development, as illustrated in Figure 1 below, begins with the human being who needs natural resources to survive. He must manage those resources in a sustainable manner through the conservation of the environment to ensure a sustainable society that will consider the interest of the future generation. There is a need for the conservation of the environment for a sustainable society; and without a sustainable society, there cannot be a sustainable environment, and a sustainable economy.



Fig. 1: Holistic Approach to ensure a sustainable society in Islam

The essential features of sustainable development in Islam are not different from what has been established in Agenda 21 but the approach to each of the elements is different. Figure 2 gives a snippet view of the essential features of sustainable development (SD) in Islam.

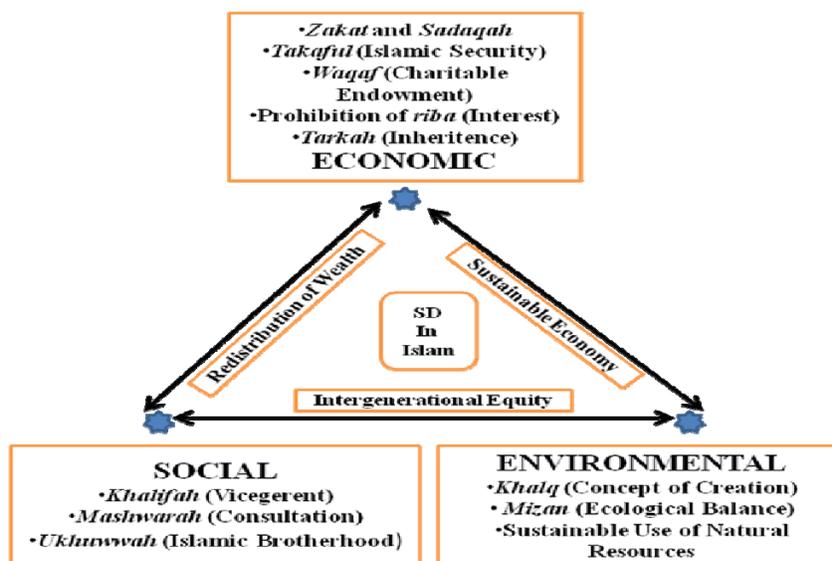


Fig. 2: Essential Features of Sustainable Development in Islam

Environmental Well-being:

This is sometimes called ecological integrity, environmental justice or intergenerational equity. The continuous damage to the environment with impunity led to the coinage of the term sustainable development, which is meant to ensure intergenerational justice through ecological balance that will also take into consideration

the needs of future generations. The concept of sustainability mainly considers different aspects of the global environment, which inherently includes the economic and social aspects (Tamura, 2005).

Wise utilisation of natural resources is a duty on man as the vicegerent of Allah (*khalifah*) on the earth to judiciously manage the available resources in a way that would bring benefit to the present generation, and will not jeopardise interests of future generations. Intergenerational equity in Islam entails an efficient and moderate utilisation of natural resources by maintaining the divine balance and generating least wastes (Abed Al-Rahim, 2010).

Economic Growth:

A sustainable economy requires an effective mechanism for the redistribution of wealth in the society because if poverty prevails, there cannot be a sustainable environment (Kates, 2005). This is where the economic dimension intersects with the environmental aspect of sustainability. Right from the advent of Islam, the unfeigned significance of the economy has been emphasised by Prophet Muhammad (s.a.w.) whose first profession was trade and commerce. In order to ensure sustainable economic growth in the society, Islam has put in place certain mechanisms. These include mandatory payment of *zakat* and voluntary payment of *sadaqat*, creation of *waqf*, prohibition of *riba* and *gharar*, and enforcement of law of inheritance. These positive measures in totality are sufficient for alleviation of poverty and creation of a sustainable society through the economic dimension of development. It is essential because for a sustainable development, a sustainable society is a prerequisite. The establishing a sustainable society by poverty eradication scheme is presented in Figure 3:

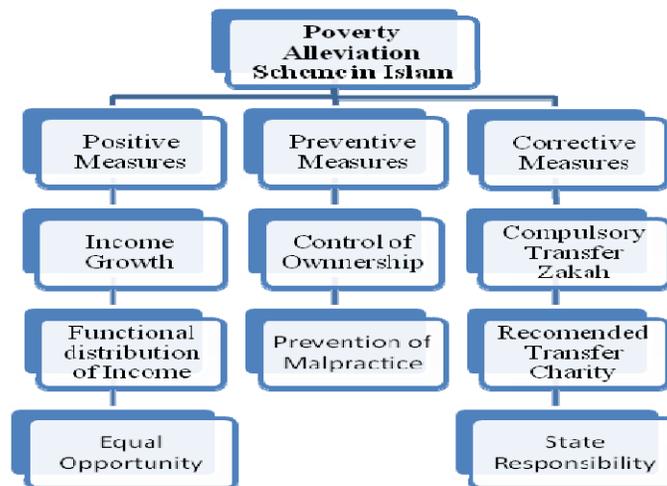


Fig. 3: Poverty Alleviation in Islam. (Sources, Sadeq, M. A., 1997. Poverty Alleviation: An Islamic Perspective, *Humanomics*, Vol. 13, No. 3.)

The measures were vigorously pursued by the Prophet (s.a.w.) and his rightly-guided Caliphs (*Khulafa*) who, at different times, implemented meaningful economic reforms for the general wellbeing of the Islamic State. The concept of *siyasah shar'iyah* (Shari'ah-oriented policy) was the key yardstick for economic development of the state. The first major step taken by Caliph Abu Bakr (r.a.) after the demise of the Prophet (s.a.w.) was to sustain the economic policies introduced by his predecessor. He waged a war against those who refused to pay *zakat*, which is considered as the third pillar of Islam. It was a difficult decision that required much resilience to ensure a sustainable society. The principal element of redistribution of resources in the state was being threatened and since it is a fundamental policy of the state to ensure economic development, there was a need to sustain the Prophetic policies (Ansari, 1994). To this end, the major policies introduced in Islam to ensure intergeneration equity and social equity through economic development is briefly examined.

Zakat (compulsory alms) and Sadaqat (voluntary alms):

As earlier observed, the major policy to ensure the continuous redistribution of resources in the society is *zakat* which is compulsory on all able citizens, who fulfil the *nisab*, of the state. The voluntary form of it is *sadaqah*, which may be given at any time on the volition of concerned members of the society. In mutual dealings in an Islamic society, one basic concept is justice, which is a common thread that runs through all the

economic, social and political policies of Islam. *Zakat*, as a tool for the redistribution of resources, has the potentiality of ensuring a just and sustainable society.

Waqf (Charitable Endowment):

Apart from *zakat*, one of the most important tools for sustainable development in Islam is *waqf*. The conceptual development of *waqf* in Islamic literature is premised on the *hadith* of ‘Umar where he endowed, during the period of the Prophet (s.a.w.), some property which was an orchard, and was known as *Samagh*. ‘Umar said, “O Messenger of Allah! I have acquired property, which in my view, is excellent. I intend to give it in charity”. The Prophet (s.a.w.) said: “Give it in charity on condition that it would neither be sold, nor gifted, nor inherited; only its fruits would be utilized”. ‘Umar endowed it on the same conditions. The endowment was in the way of Allah and was for the manumission of slaves, and for the benefit of the indigent, the guests, the travellers and the relatives. There was no harm if the person managing it ate from it in the approved manner or fed his friend with it provided it was not hoarded (Khan, n.d.: *Hadith* No. 38). It ensures sustainability of the community through recurrent charitable endowments whose ownership is vested in Allah (s.w.t.) and its beneficial use is meant for human beings. The total consumption of a *waqf* property is prevented since the ownership vests in Allah (s.w.t.) for the purpose of repeatedly exploiting its usufruct for the benefit of human beings. That element of sustainability is in-built within the *waqf* institution (Ali, 2009). The economic value of *waqf* properties must be effectively utilised to unravel their hidden economic potentials for establishing a sustainable society. When there is appropriate management framework for the *waqf* institution in the society, such usufruct communally derived from the *waqf* properties will be enjoyed by the present generation as well as future generations till eternity.

Prohibition of riba (interest):

Unjust enrichment through interest is prohibited in Islam. Entrepreneurship is encouraged in Islam. So, any return on funds provided by the lender must be derived from profit derived from a commercial risk through joint venture. The reason for the prohibition of *riba* is the resultant harmful effect on the economy, social life and the psychological well-being of the society. For a sustainable economy, all forms of unjust enrichment must be proscribed to allow for equal opportunities to all. The worst effect of *riba* is felt on the state level where the economy of the country is directly affected and falls under the control of others due to the debt and compound interest bondage. The recent global financial meltdown is a testimony to the destructive nature of *riba* because the underlying cause of the economic plummet was the excessive rates of interest where many multinationals could not redeem their debts. The effects of such economic crisis affect both the economic growth and social fabric of the society.

Law of Inheritance (mawarith)

Islam has arranged all succession issues affecting human beings. There are fixed ratios for each heir, which allow for sustainability of the family life. The Qur’an gave the entitlements of each heir in specified ratios which cannot unnecessarily be subjected to amendments by the heirs. Sustainability of the family is maintained by giving higher shares to those members of the family who are entrusted with the responsibility of taking care of the family. This is the reason behind the ratio 2:1 for male and female heirs respectively. Such divine policy is specifically targeted at maintaining a sustainable economy and allow for the redistribution of resources from the micro to the macro level of the society. Thus, the law of inheritance in Islam is a formidable mechanism for intergenerational equity in the distribution of wealth (Hasan, 2006).

Social Justice or Equity:

This is sometimes called intergenerational equity. The concept of social justice is a key aspect of Islamic civilisation. Key Islamic concepts that are specifically meant to promote social justice and equity include *takaful* (social security and mutual assistance), *ukhuwwah* (Islamic brotherhood) and *shura* (mutual consultation). These are duties conferred on man to ensure a sustainable society based on the special position of *khilafah* he has been endowed with. Islam regards wasting of natural resources and exploitation of fellow human beings as condemnable social evils. People are encouraged to assist their kith and kin, neighbours, wayfarers and the poor to ensure a sustainable society.

Environment and Development:

The concept of development and environment are inextricable and interdependent. Sustainability is the guiding principle when embarking on massive development, which only takes place in an environment. Though development is necessary for human progress, the impact of such development on the environment must be given due consideration. This is where the sustainability principles in Islam come to play to adequately balance the need for development and the conservation of the environment Ahmad, 2007). A combination of the concepts of *tawhid* (oneness of Allah), *khilafah* (vicegerency) and *amanah* (trust) in the sustainable management of natural resources in the environment while developing the society support the Islamic perspective of conservation of environment (Ainul Jaria Maidin, 2007). Necessary steps to safeguard the environment and combat climate change are essential to delivering sustainable development. To this end, Islam provides general framework for the sustainable utilization of the natural resources, particularly water, trees and animals (Ansari, 2003-2004). It is, therefore, necessary to examine each of these aspects of the environment and development in Islam.

Water and Sustainable Development:

In the management of natural resources in Islam, water occupies a significant place as it plays manifest roles including giving lives and sustaining them, including human lives. Appropriate water management strategies have been introduced by Islam, since its advent, over a millennium ago. The Qur'an refers to water and related resources in several verses. The word *ma'* (water) appears sixty-three times, while the word "river" and its derivatives occur in about fifty-two times in the Qur'an (Abdul Baki, 1987). The centrality of water to life in the ecosystem is reflected in the often-quoted verse in the Qur'an: "*And We created from water every living thing*". (Qur'an, 21:30) This explains the significance of water in the ecosystem, which is the unifying medium among all creations in the ecosystem (Amrey, 2001). Therefore, the human-environment interaction must be geared towards sustaining water and natural resources contained in water such as marine life. The role of humans as *khalifah* (vicegerent) and the trust (*amanah*) placed on the shoulders of mankind necessitate the conservation of water resources through equitable and sustainable manner that must take into consideration the right of others, including the unborn generations, to enjoy the benefits of such valuable resources (Al-Jayyousi, 2001). Allah (s.w.t.) has created two types of water, one sweet and palatable and the other salty, to serve two different purposes. If we pollute inland water, we will demolish the divine barrier, which will be against the divine wisdom.

In Islam, the supply of water is considered fixed in accordance with the divine measure and it is encouraged that it should not be wasted in all circumstances even when one is performing religious duties. The verse which reads: "*And we send down water from the sky in fixed measure*" (Qur'an, 40:18) emphasises the importance of effective management of water resources since it is fixed and may not be increased according to demands. Therefore, human beings are enjoined to enjoy this divine gift but with a caveat: "*O Children of Adam! . . . Eat and drink: But waste not by excess, for Allah loveth not the wasters.*" (Qur'an, 7:31) In strict compliance with these sustainable directives, it was reported that Prophet Muhammad (s.a.w.) used to perform ablution with one *mudd* of water [0.6 litre] and used to take bath with one *sa'* up to five *mudds* [2.5 – 3.5 liters]. (Bukhari, No. 200) This Prophetic tradition (*hadith*) explains the practical demonstration of the sustainable use of water resources, which the Prophet (s.a.w.) personally taught his Companions. Even when though one is at the bank of a river, the Prophet (s.a.w.) cautioned: "Do not waste water even if performing ablution on the bank of a fast-flowing (large) river." (Tirmidhi, No. 427) The logic behind these effective measures towards the conservation of water is the fact that if wastage is not allowed in religious duties such as performing the ritual ablution, the rule becomes stricter in other matters such as development. Therefore, the sustainability of water and its resources must be the focal point of policymakers in countries across the world. To sum up, water is for life, natural water is the common heritage of mankind, man is duty bound to use it only to the extent of necessity, and its pollution is strictly prohibited as in that case it will fail to play its assigned role. Man will have to give account (*hisab*) for unreasonable use of water.

Trees and Sustainable Development:

The earth has a very good balance of fauna and flora. The importance of biodiversity, particularly in the context of sustainable development has been repeatedly emphasised in Islam. From the perspective of trees and sustainable development, green development has to be encouraged for environmental justice. The act of planting trees and preventing deforestation is highly encouraged in Islam. Even during battles, Muslims are mandatorily required to avoid the cutting of trees because of their hidden potentials, whether from the dimension of their economic impact on the society or the aspect of ecological balance in the biotic community (Ansari, 2000-2001). In emphasising the divine wisdom behind the plant environment, Allah (s.w.t) says: "It is He Who sends down rain from the sky: From it ye drink, and out of it (grows) the vegetation on which ye feed your cattle. With

it He produces for you corn, olives, date-palms, grapes, and every kind of fruit: Verily in this is a sign for those who reflect.” (Qur’an 16:10-11) These beneficial trees from which the fauna and humans benefit are mercy of Allah (s.w.t.). They also adore Him (s.w.t.). So, their use must reflect the element of sustainability for which they were created. The role of trees in maintaining ecological balance includes the fresh oxygen they exhale which is useful for mankind and animals. Trees absorb and store carbon dioxide, i.e. they prevent global warming. They control the water cycle. From the economic perspective, they are sources of food, fruits, vegetables, medicines, rubber, wood, etc. For this reason, Prophet Muhammad (s.a.w.) said: “Muslims will always earn the reward of charity for planting a tree, sowing a crop and then birds, humans, and animals eat from it.” (Bukhari, No. 513) Conservation of trees through the positive steps towards reforestation is strappingly encouraged in Islam. The Prophet (s.a.w.) is also reported to have said: “Whenever Muslims plant a tree, they will earn the reward of charity because of the food that comes from it; and likewise what is stolen from it, what the wild beasts eat out of it, what the birds eat out of it, and what people take from it is charity for them”. (Muslim, 2904) It is considered a charitable deed to plant trees, which are beneficial to the whole gamut of biodiversity.

Sustainable development in the conservation of the vegetation is an act of worship as well as a charitable deed in Islam. In his quest to conserve the environment through the promotion of green development, the Prophet (s.a.w.) once said: "If one of you has a palm seedling and can sow it before he rises up on the Day of Judgment, then, he should do so." (Related by Al-Bukhari. Also see Ahmad bin Hanbal, Vol. 5, p. 191) Therefore, in balancing the developmental needs of the modern society and the need to conserve the environment, recourse has to be had to the above Prophetic precedents which make it mandatory to carry out environmental impact assessment before any form of construction. And it is required that for the sake of sustainability, preference must be given to the conservation of the environment through reforestation and conservation of vegetation. To sum up, trees are for the benefit of man, but their over exploitation is prohibited. Thus, Islam requires deforestation and reforestation to go hand-in-hand.

Animals and Sustainable Development:

Animals are undeniably part of the biodiversity, which must be conserved, for maintaining the ecological balance, which is essential for sustainability of the environment, by all reasonable means. Islam has recognized them communities which adore Allah (s.w.t.). They are servient to man but man has to have harmonious relations with the. Their over exploitation and cruelty to them are prohibited. In the words of the Prophet (s.a.w.), “all creatures are like a family of Allah: and he loves the most those who are the most beneficent to His family.” (This *hadith* was narrated by Anas and related by Al-Bukhari.) This is a confirmation of an earlier declaration made by Allah (s.w.t.) where He says: “There is not an animal on earth, nor a bird that flies on its wings, but they are communities like you...” (Qur’an, 6:38) Though there are more references in the Qur’an and *Sunnah* on animals as part of biodiversity, these two references emphasise the important of taken into consideration animal rights in any form of development. Needless to add that development is meant for the advancement of human beings within the society, and if the concept of development is considered from a wider perspective enunciated in Islam, every aspect of it must be geared towards balancing the needs of development and the conservation of wildlife (Yahya, 2003).

Even though human beings are allowed to slaughter permissible animals for the purpose of consumption, Islam regulates the process of slaughtering. One must use a sharp knife to avoid much pain on the part of the animal. This is why stunning an animal with a blow is not allowed before slaughtering it. Qur’an 5: 3 reads: “Forbidden to you (for food) are: Al-Maytah (the dead animals - cattle - beast not slaughtered), blood, the flesh of swine, and that on which Allah’s Name has not been mentioned while slaughtering (that which has been slaughtered as a sacrifice for others than Allah, or has been slaughtered for idols) and that which has been killed by strangling, or by a violent blow.”

Similarly, electric shock causes so much suffering to the animal before it eventually dies; so, such is also forbidden. The Prophet (s.a.w.) forbade tormenting any kind of animal to death. According to the narration of Shaddad ibn ‘Aws, the Prophet (s.a.w.) said: “Allah has decreed kindness (or proficiency) in all things. So when you kill, kill well, and when you slaughter, slaughter well. Let one of you sharpen his blade and spare suffering to the animal he slaughters.” (Related by Muslim. Also see in *Fatawa al-Najmah al-Daa’mah*, Vol. 22, pp. 456-457) An edible animal cannot be slaughtered or killed for any other reason other than as a sacrifice to Allah (s.w.t.) which includes eating the animal itself. Any form of slaughtering or killing without eating the same is tantamount to wastage of natural resources and such debauched act is forbidden in Islam. In a similar vein, the advancement of development should not lead to uncontrolled destruction of wildlife because that would amount to a catastrophic loss of natural resources. Since man and animals share the natural resources, the interest of the animals must be considered while undertaking wild developmental projects that would impact on the existing natural resources. To sum up, on the basis of divine wisdom we can say that animals are groups like us, they adore Allah (s.w.t.), we should maintain harmonious relations with the, we should not be cruel to the. As they

are part of the environment and serve the human purpose, sustainable development imperatives demand that their ratio should be maintained by practicing *in situ* and *ex situ* means of regeneration

Air and Sustainable Development:

Air is not less important than water for survival of all living creations on the earth. It is, therefore, warranted that the ratio of gases in the atmosphere should be maintained and the ozone shield, which protects lives on the earth from ultraviolet rays coming from the sun, should also be protected from erosion. It is needless to say that the Islamic concepts of vicegerent (*khalifah*) and trust (*amanah*) make us duty bound to maintain that ratio which is naturally there. We forgot our duty; it is because of this that the flora and fauna are adversely suffering because of many unwanted natural phenomena, notably, unusual weather conditions cause by global warming. Efforts are being made at national and international levels to reverse it; but due to vested interests of some of developed countries, the desired results seem to be far. It is obvious that for a sustainable development sustainable air is a prerequisite; otherwise, world might face with millions of environmental refugees. In short, for generating and preserving lives, ratio of gases in the air must be maintained. For this reason, Allah (s.w.t.) says wind brings the message of glad tidings. If air is polluted, there will be no glad tidings as instead of giving lives, rains will take lives.

Genetic Modification:

Genetic modification of plants and animals is a must in order to meet the future challenges of providing food to the growing population in developing and least developed countries. However, it has been a matter of controversy when we assess LMOs, GMOs and GM food from the point of view of safety to the environment and human, animal and plant life and health, also when we judge it from the religious and ethical perspectives. While series of research are still ongoing on the effect of genetically modified plants and food on humans and the environment, there is a need to examine this issue from the religious and ethical perspectives. Before considering the Islamic perspective, it is important to examine the definition and nature of genetic engineering. Genetic engineering, which is sometimes called genetic modification “refers to the techniques whereby recombinant DNA, hybrid DNA made by artificially joining pieces of DNA from different sources, is produced and utilised” (Ansari, 2003-2004). When such human manipulation does not occur under natural conditions, such product whether plant or animal, is said to be genetically modified (GM). It is said that, “[t]he significant breakthrough is invention of new species of corn, soya bean and cotton that are readily being used in food products. These have quality to grow faster and produce more and better quality even in adverse weather conditions. Some of them have quality to generate pesticides by themselves.” Generally, plants are genetically modified for two purposes. First, GM is to reduce the cost of producing these plants by making them resistant to disease. Second, is to improve the quality of the product, by improving its appearance and nutritional components that relates to manufacturing and storage. Apart from gene modification of the same species, scientific advancement has made it possible to “introduce genes taken from bacteria, viruses, insects, animals or even humans into plants” (Pence, 2002). In the context of genetic modification *vis a vis* conservation of the environment, and protection of human, animal and plant life and health, the following points are necessary to be discussed.

Sustainable Development: A Clash between Public Interest and Individual Interest (interest of scientists engaged in Genetic modification and producing states):

Islam encourages mankind to utilize permissible (*halal*) and pure (*tayyeb*) edible resources. The Kuwait Conference organized by the OIC emphatically supported the use of gene manipulation techniques for improving the genes of pertinent plant and animal species in the interest of the environment and human, animal and plant lives and health. In view of this, it is important to consider whether such living modified organisms (LMOs) and food containing genetically modified organisms (GMOs) (genetically modified organisms can be living as well as non-living) are safe for man and the environment. With poverty staring at the faces of a large population of the world, scientists have rightly argued that the need to invent new methods of providing more food to everyone becomes more pressing. But such endeavour must be safe to the environment and human health. They should not be compromised for fame or a short - term monetary gain. This goes the same for scientists engaged in producing and governments exporting them. It is for this reason that safety experimentations, in the lab in the field are highly warranted. There are mechanisms within Islamic jurisprudence to consider the beneficial aspects of new invention such as the GM revolution. Public interest (*maslahah mursalah*) and necessity (*dharurah*) permit measures that will bring about benefits to the populace and prevent any form of harm that is associated with such measures. (See *infra*)

The WTO has both the environment and trade mandates but the former has been a subject of intense debate as a result of some recent decisions in favour of trade. (EC Bio Case) There seems to be a clash between the

objectives of free trade and the protection of environment and public health (Peel, 2007). The environmental concerns and the need to promote trade have been a subject of controversy among the environmentalists and free international trade promoters. It is important to briefly consider sustainable development under the SPS Agreement and the Cartagena Protocol and the need to strike a fair balance between the environment and trade. It is difficult but not impossible. There might be two solutions; one, to consider multilateral trade agreements, especially the Convention on International Trade in Endangered Species (CITES), the Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and their Disposal (Basel Convention), the Montreal Protocol and the Cartagena Protocol, as an exception to the GATT; two, to suitably amend the General Agreement on Trade and Trade (GATT). So far production, consumption and export of GMOs is concerned, the provisions pertaining to precautionary principle of the Cartagena Protocol have to applied by the WTO in resolving international disputed on exports of GMOs. But the cases decided by the Panels and the Appellate Body of the WTO have shown strict adherence to the provisions of the SPS agreement rather than to apply the Cartagena Protocol's precautionary principle. This is unfortunate, as it is against the interest of general public (*malalah mursalah*).

In the recent case named *Organic Seed Growers and Trade Association, et al. v. Monsanto, et al.* (Case No. 11 CIV 2163) the U.S. District Court of the Southern District of New York was faced with a clear-cut case on the proliferation of transgenic seed in the United States of America. The case was filed by the representatives of twenty-two agriculture membership organizations, twelve seed businesses, and twenty-six farms and farmers. The plaintiffs who span the entire U.S. are largely organic farmers. The plaintiff sought that the court should declare that in the event of any contamination by the defendant's (Monsanto) transgenic seed, they would be sued patent infringement. Monsanto's most predominant transgenic trait is glyphosate tolerance, which is considered a threat to the human life. In addition, the increased use of glyphosate caused by Monsanto's transgenic seed has in turn caused weeds to become resistant to the herbicide. Above all, Monsanto admitted that its product contaminates natural crops. In a judgment dated March 29, 2011, the court held that Monsanto's transgenic seed patents are all invalid and hence unenforceable. The court relied on the decision of Justice Story of 1817 in *Lowell v. Lewis* (15 F. Case. 1018 (C.C.D. Mass. 1817) where he held that for an invention to be patentable, it must not be "injurious to the well-being, good policy, or sound morals of society", and "a new invention to poison people or to promote debauchery, or to facilitate private assassination ... is not a patentable invention". (page 1019) In this kind of case, Islam will not only declare the patents invalid but it will go a step further to compulsorily wind up the company to avoid further manufacturing of harmful transgenic seeds.

Sadd Al-Dhari'ah: A Justification for Applying the Precautionary Principle In Islam:

A precautionary concept, which is regarded as one of the secondary sources of Islamic law is *sadd al-dhari'ah* (blocking the lawful means to an unlawful or harmful end). This is a precautionary principle, which has its basis in the Qur'an, intended to forestall deeds or policies, if pursued, might lead to impermissible conduct or may have harmful effect on the people, environment and the entire biodiversity. The legality of *Sadd al-Dhari'ah* is established in the Qur'an and *Sunnah*. Qur'an 2: 104 reads: "O believers! Address not the Prophet by the word *ra'ina*, but address him respectfully and listen to him". The word *ra'ina* in the verse is deliberately left without a translation because it is a homonym. The two meanings of the word are different; the first may mean "please look at us" but with a slight twist, the same word means "our shepherd". The Jews used to insult the Prophet (s.a.w.) with the same word. So, in order to block the means to such word, which has the potentiality of being used in the abusive sense, Allah ordered the believers to use a different term. In a similar vein, there are a number of Prophetic dispositions that were specifically meant to block the lawful means to a harmful or unfavourable end. An example of such is the ruling of the Prophet (s.a.w.) where he forbade the creditor from receiving gift from the debtor, lest such gift may be considered as an alternative to usury.

There are some According to Ibn al-Qayyim, *sadd al-dhari'ah* is an important concept which is considered as one-fourth of the *Shari'ah* (Ibn Al-Qayam, 1955). Nyazee gave the example of the ban on the cultivation of poppy in many countries as a result of its exploitation in the production of opium and heroin (Nyazi, 2006). The same rule applies to any policy that is harmful to the people and the environment. The concept of *sadd al-dhari'ah* "is founded in the idea of preventing an evil before it actually materialises" [16]. This in effect, justifies the preventive measures contained in the Cartagena Protocol and the SPS Agreement. Although provisions contained in them are different, they aim at protection of the environment and human health.

This precautionary principle, recognised in Islam, is a measure towards blocking the means to a harmful result. *Sadd al-dhari'ah* is a precautionary principle that is extendible to issues pertaining to genetic modification. Even though the aim of producing GMOs is to provide food in abundance, which is considered a beneficial solution to the perennial problem of shortage of food in some developing countries, the harmful effects of such technological advancement to the people and the environment may be good reasons to invoke this principle in the affirmative sense. As earlier explained, recent developments in the United States explain the

harmful effects of some measures of genetic engineering to the environment. Sustainable development in genetic modification involves all measures towards the protection of the environment. From the Islamic perspective, trade cannot in any way take precedence over the conservation of the environment. This is because for commercial activities to thrive in a society, a sustainable environment must be put in place.

Furthermore, in order to prevent pollution –water, air, and land– reasonable precautionary measures must be put in place to prevent damage to the people and the environment. *Sadd al-dhari'ah* is a useful “tool to prevent all causes of environmental degradation, because of abuse and over exploitation, whether direct (pollution and hunting, particularly hunting endangered species) or indirect (deforestation and increasing the levels of carbon dioxide and other greenhouse gases)” (Izzi Dien, 2000). Islamic law primarily seeks to maximize every benefit for mankind and prevent any possible harm that will bring about total destruction of the entire mankind. Among the four types of *sadd al-dhari'ah*, environmental sustainability falls under the means, which frequently leads to evil but in which there is no certainty or a dominant probability that that would always be the case (Kamali, 1991). Other types of *sadd al-dhari'ah* are: Means which definitely lead to evil; means which is most likely to lead to evil and is rarely, if ever, expected to lead to benefit; and means which are rarely expected to lead to evil and are most likely to lead to a benefit.

Waste Management:

Waste management involves appropriate mechanisms to reduce the amount of waste generated, manage the unavoidable waste to avoid unpremeditated pollution, and establish an effective recycling system. The whole concept of waste management in Islam is founded in a number of concepts in Islam. The integrated environmental solutions from the Islamic perspective include reduction of waste generation, civic sense, establishing a centralised system of garbage collection and waste treatment, prohibition of burning of waste, recycling, and any other measure that is directed at mitigating excessive use of resources.

Reduction in waste generation:

The first step towards sustainable use of natural resources is to reduce the amount of waste being generated. A cardinal concept of waste management in Islam is the avoidance of *israf* (waste of resources) (Muyibi, 2005). A special obligation of the stewardship with which Allah (s.w.t.) has entrusted man is to prevent waste of natural resources (Comel, 2007). The amount of disposable wastes should be drastically reduced through effective management of the natural resources. In a divine directive on sustainability, Allah (s.w.t.) says: “O Children of Adam! Wear your beautiful apparel at every time and place of prayer: eat and drink: But waste not by excess, for Allah loveth not the wasters.” (Qur'an, 7:31) Waste generation is directly related to extravagance, which is common in this age of consumerism. Allah (s.w.t.) does not like people who suffer from squander mania. He (s.w.t.) says these people are friends of devils (*shayatine*). (Qur'an, 17, 26-27) Calculated efforts towards the reduction of waste starts from the individual level where everybody is required to be his brother's keeper. So, instead of producing unnecessary waste, such resources may be shared with one's neighbour based on the concept of Islamic brotherhood (*ukhuwwah*). United Nations Food and Agricultural Organisation (FAO) has revealed that 1.3 billion tonnes of food are lost or wasted every year. The study found that food wastes are relatively more in developed countries. They waste 222 million tonnes of food every year. Due to less affluence, in developing countries, wastage of food is relatively less. However, in affluent developing countries like Malaysia, Thailand, The Philippines and South Africa, Wastage of food has become a matter of great concern. In Malaysia alone, 1,000 tonnes of unconsumed food is thrown every day. (*New Sunday Times*, 5 June 2011) This is the result of consumerism. In Islam, buying more than what is really required by the household is an act of *asraf*; and throwing food, which can be consumed by others, is against *maslahah mursalah*. If peoples and governments take necessary steps that extra food can be distributed among those who do not get enough food. Abdullah ibn Amr narrated that a companion who was well-versed in *hadith* had a sheep slaughtered. He repeatedly asked his servant: “Have you sent some meat as a present to our neighbour?” When he said that several times, he added: “I have heard Allah's Messenger (s.a.w.) saying: ‘Gabriel has repeatedly recommended me to be good to my neighbour until I have thought that he would include him among my heirs.’” (Abu Dawud, No. 2446) In a similar *hadith* which encourages people to share their resources with their neighbours to avoid waste or spendthrift, the Prophet's cousin, Abdullah ibn Abbas narrated that he heard the Prophet (s.a.w.) saying: “A believer is not the one who eats his fill when his neighbour is hungry”. (Related by Al-Bukhari, Al-Hakim and Al-Baihaqi) A step towards good neighbourliness is a step towards the effective management of resources, which will enormously reduce waste.

Civic sense in waste management:

The idea of civic sense in waste management is also based on the concept of Islamic brotherhood (*ukhuwwah*). People must have civic sense in themselves by protecting one another from diseases and other harmful things in the society. This involves effective management of one's waste to avoid causing harm to one's immediate neighbour. Proper disposal of waste will automatically avoid incidences of communicable health problems especially as they affect one's neighbours. Lack of civic sense brings about health issues within one's immediate society. This is why the Prophet (s.a.w.) forbade people from relieving themselves on a path people use, in a place they go for shade and in water sources. [Abu Hurairah narrated that the Messenger of Allah, may Allah bless him and grant him peace, said, "Beware of the two cursed things." They said, "What are the cursed things?" He said, "Someone relieving himself on a path people use or in a place they go for shade." Related by Muslim, No. 1771] Urinating in stagnant water or the bank of a flowing river is also prohibited in Islam.

Centralised system of garbage collection and waste treatment:

As earlier observed, Islam promotes every measure that brings about benefit to mankind. Therefore, a centralised system of garbage collection and waste treatment will bring about benefits to the people. Once such a system is put in place, Islam encourages people to follow strictly the rules of such system because it is in the public interest (*maslahah mursalah*) which must be respected in all circumstances.

Prohibition of waste burning:

Burning of waste should be avoided and all necessary measures to enforce such a rule must be brought into being to avoid unnecessary pollution. Considerations of public interest require the prohibition of waste burning to avoid the release of obnoxious and harmful gases to the environment such as carbon monoxide (CO₂), methane (CH₄) and nitrous oxide (N₂O). Air pollution might cause global warming and haze. Such air pollution is not only harmful to humans, but to the animals and plants. In addition, pollutants should not be released to the water because such dangerous waste will be harmful to the health of those who depend on such rivers for their daily living. Islam prohibits the release of dangerous chemicals and effluence to the rivers and other water channels as the Qur'an provides: "Do not do mischief on earth after it has been set in order" (Qur'an, 7:85) The mischief mentioned in the verse includes environmental degradation through any form of pollution which is considered harmful to both human and animal life. Water has to serve a purpose and any form of degradation tampers with the ecological balance set by the divine order.

Recycling of recyclable waste:

The concept of a moderate *Ummah* (*ummatan wasatan*), emphasised in the Qur'an, which requires us to be moderate in buying and consuming things, is founded on the just and efficient management of resources, which necessarily involves the sustainable use of things through recycling. Islam promotes recycling as part of the *Shari'ah*-oriented policies (*siyasah shar'iyah*) to protect the environment and encourage sustainable use of the resources man has been endowed with. The concept of balanced nation also considers the balance of nature, which is part of the greatness of Allah (s.w.t.). Islam does not only promote recycling but reuse is also encouraged where necessary. All efforts to convert from waste to value-added products are in line with the Islamic teaching of waste management.

Incinerating wastes:

It has always been emphasized that minimizing wastes generation, treating them, using them as raw material for manufacturing other products, disposing and incinerating them are imperatives of sustainable development. They serve environmental purpose and help maintaining its processes and protecting human health. Thus, they come under the Islamic principle of public interest (*maslahah mursalah*). In order to achieve this Islamic goal, we should dump waste at a remote place so that they do not pollute watercourses, ponds, lakes, or underground water channels. We should also augment our research converting wastes into value-added products. So far incineration is concerned plasma incineration is the best available option. This does not bring fear of emission of dioxin and furan, which is emitted from non-sophisticated incinerators.

Conclusion:

Because of human extravagance and negligence the environment is adversely affected, in turn, causing harm to the environment, its processes and all flora and fauna, including the human mass. In spite of all efforts,

joint and several, the condition is worsening. Perhaps, the main impediment for this is the vested interests of many developed and industrialized countries, especially Organization of Economic Cooperation and Development (OECD) countries. In order to revert this situation, the concept of sustainable development has been brought into practice. The sustainable development imperatives contained in international instruments and national laws, have not shown encouraging results. The idea of sustainable development is already there in Islam. If we add, Islamic injunctions pertaining to conservation of the environment to the existing efforts made by nation states, they will certainly yield positive results and the development might be sustainable. It is for this reason that it is suggested that these Islamic imperatives must be surfaced through expository writings like this article, and be brought into practice in the Muslim world.

References

- Abdul Baqi, M.F. Al-Mu'jam al-Mufahras li Alfaz al-Qur'an al-Karim, 1987. [The dictionary of the phrases of the Glorious Quran]. Cairo: Dar al-Hadith.
- Abed Al-Rahim, M.Y. 2010. "Environmental Sustainability and Islam ." *The 15th General Conference on the Environment in Islam 27-29 September 2010*. Amman, Jordan: The Royal Aal al-Bayt Institute for Islamic Thought.
- Ahmad, 1997. Akhtaruddin. *Islam and the Environmental Crisis*. London: Ta-Ha Publishers Ltd.
- Ainul Jaria Maidin. 2007. "Religious and Ethical Values in Promoting Environmental Protection in the Land Use Planning System: Lessons for Asian Countries." In *Issues in Islamic Law*, by Abdul Haseeb Ansari, 188-218. New Delhi, India: Serials Publications.
- Alexander, D.R., 2003. "Editorial: Uses and abuses of genetic engineering." *Postgraduate Medical Journal*, 79: 249-251.
- Ali, Imtiaz B., 2009. *Waqf: A Sustainable Development Institution for Muslim Communities*. Trinidad and Tobago: Takaful T&T Friendly Society.
- Al-Jayyousi, Odeh. 2001. "Islamic water management and the Dublin Statement." In *Water management in Islam*, edited by Naser I. Faruqi, Asit K. Biswas and Murad J. Bino, 33-38. Japan and Canada: United Nations University Press & International Development Research Centre.
- Amery, Hussein A., 2001. "Islam and the environment." In *Water Management in Islam*, edited by Naser I. Faruqi, Asit K. Biswas and Murad J. Bino, 39-48. Japan and Canada: International Development Research Centre/United Nations University Press.
- Ansari, Abdul Haseeb. 2003.-2004. "Right to a Healthful Environment: An Established human Right in Islam." *Religion and Law Review XII-XIII*: 111-129.
- Ansari, Abdul Haseeb, and Perveen Jamal, 2001-2002. "Towards an Islamic Jurisprudence of Environment: An Expository Study." *Religion and Law Review X-XI*: 79-103.
- Ansari, M.I., 1994. "Islamic Perspectives on Sustainable Development." *American Journal of Islamic Social Science*, 11(3): 394-402.
- Cornell, Vincent J., Virginia Gray Henry-Blakemore, and Omid Safi, 2007. *Voices of Islam*. United States of America: Praeger Publishers.
- Hasan, Zubair. 2006. "Sustainable Development from an Islamic Perspective: Meaning, Implications, and Policy Concerns." *J.KAU: Islamic Economics*, 19(1): 3-18.
- Ibn al-Qayyim, 1955. *I'lam al-Muwaqqi'n*. 3. Cairo: Maktabah al-Sa'ada.
- Izzi Dien, Mawil., 2000. *The Environmental Dimensions of Islam*. Cambridge, England: The Lutterworths Press.
- Kamali, Muhammad Hashim, 1991. *Principles of Islamic Jurisprudence*. Cambridge: Islamic Text Society.
- Kates, Robert W., Thomas M. Parris, and Anthony A. Leiserowitz, 2005. "What is Sustainable Development? Goals, Indicators, Values, and Practice." *Environment: Science and Policy for Sustainable Development*, 47(3): 8-21.
- Khan, Muhammad Muhsin, *Sahih Al-Bukhari (Arabic-English)*. Vol. IV. Medina: Al-Maktabat al- Salafiat, n.d.
- Martine, Andrea. 2010. "Sustainable Development in the Urban Environment -Urban Development: A Viable Option after Rio 2012?" *Sustainable Development Law & Policy*, pp: 17.
- Muyibi, Suleyman A., Parveen Jamal, and Hamzah Mohd. Salleh, 2005. "Islamic Perspectives on Environmental and Waste Management Issues." *Journal of Islamic Law Review*, 1: 31-56.
- Nyazee, Imran Ahsan Khan. 2006. *Islamic Jurisprudence (Usul al-Fiqh)*. New Delhi: Adam Publishers and Distributors.
- Peel, Jacqueline. 2007. "A GMO by Any Other Name . . . Might Be an SPS Risk!: Implications of Expanding the Scope of the WTO Sanitary and Phytosanitary Measures Agreement." *The European Journal of International Law*, 17(5): 1009-1031.
- Pence, Gregory E., 2002. ed. *The Ethics of Food: A Reader for the Twenty-First Century*. Maddington: Rowman and Littlefield.

- Roughton, Geoffrey E. 2007. "Environmental Law and Governance in Islam." *Columbia Journal of Environmental Law*, 32: 99-139.
- Scarlet, Lynn, 2010. "Introduction: Cities and Sustainability -Ecology, Economy, and Community." *Sustainable Development Law & Policy*, 11: 2-3.
- Tamura, Masaki, 2005. "Environmental Aspects of Concrete Structures in Sustainable Society." *10DBMC International Conférence On Durability of Building Materials and Components*. France.
- "The Environment from an Islamic Perspective, 2001." *Environment Policy and Law*, 31(3): 162.
- United Nations Conference on the Human Environment, Rio de Janeiro, Braz., June 3-14, 1992. "Rio Declaration on Environment and Development." *U.N. Doc. A/CONF.151/26/Rev.1 (Vol. I), Annex I (Aug. 12, 1992)*. <http://www.unep.org/Documents.Multilingual/Default.asp?documentid=78&articleid=1163>.
- United Nations World Commission on Environment & Development. "Report of the World Commission on Environment and Development: Our Common Future; Annex I: Summary of Proposed Legal Principles for Environmental Protection and Sustainable Development Adopted by the WCED Experts Group on Environmental Law." *U.N. Doc. A/42/427 (Aug. 4, 1987)*. 1987. <http://www.un-documents.net/ocf-al.htm>.
- Yahya, H.S.A., 2003. Importance of Wildlife Conservation from Islamic Perspective. Georgia: Authors Press.