

ISLAM AND CLIMATE CHANGE: IMPACTS AND CHALLENGES

OMAR JAH PhD

Abstract

This paper examines Islam and climate change, with a view to extrapolating the impacts and challenges of climate change and the views of Islam on the global phenomenon. The impacts of the twin phenomena of global warming and climate change ravaging the global community in recent times are enormous, extensive and excruciating. Fueled more by anthropogenic factors, climate change has continued to produce adverse effects on human society, cutting across all spheres of life. Some of these effects include increase in land and ocean surface temperatures, unpredictable regimes of rainfall and accelerated incidence of devastating hurricanes, drought and desertification leading to fall in agricultural production, shortage of water supply, extinction of various flora and fauna as well as wildlife, and decreased human life expectancy due to increased heat waves resulting in various health hazards. In

the face of these challenges, Islam one of the world's leading religions, provides its numerous followers with Islamic principles and practical guides on how to relate with their environment. These principles find expression in the teachings of the Quran on Tawhid, khalifah and mizan which stipulate the relationship between humans and their environment. In order to interrogate this important subject, the researcher adopted the use of secondary sources of data as the method of research. It is argued here that failure of the trusteeship role by humans through various activities on the earth led to climate change. The paper concludes by making some recommendations as mitigating measures against further impacts and challenges of climate change.

Keywords: climate change, global warming, greenhouse gases, atmosphere, weather fluctuations

Introduction

For decades, due to factors such as population growth, industrialization, urbanization etc. human beings have demonstrated little or no care about their environment. Thus, the uncontrollable emission of pollutants into the atmosphere, indiscriminate cutting of trees for industries and other household uses, and the destruction of wildlife and other human activities have led to the depletion and erosion of ecosystem or the ozone layer. In recent times, the global community is faced with increased incidence of various kinds of tsunamis, hurricanes, typhoons, earthquakes and flooding, devastating various parts of the world. A lot of damages have been done to the human environment and the resultant effects is the loss of several lives and destruction of property.

In Africa, we have heard of or watched on television human displacements and loss of lives and property arising from floods and other natural and man-induced disasters across many countries in the continent. Unfortunately, many people, especially the uninformed class, are unaware of what has brought about these devastations. Many of them attribute the current vagaries of climate and the painful reality of their economic and social losses to punishment from the gods in response to

the criminal acts of the present generation which they listed to include rainmaking, kidnapping, armed robbery and general lawlessness. Accordingly, there is general resignation to the will of the deity and a call for prayers and sacrifices in propitiation of the gods.¹ It is obvious that such people are yet to understand the phenomena and attendant implications of global warming and climate change. This presupposes that such people are both neither reasonably aware of their individual and collective contributions to the incidence of the phenomena nor are they equipped to properly respond to observable changes and impending hazards and disasters. It is believed that a large percentage of people in the developing countries have little or no knowledge about climate change and the magnitude of its impacts. Scientists have proved that there are daily fluctuations in atmospheric conditions (weather), as there are long term fluctuations in climate which overtime caused or contributed to ecological adaptations, migrations, catastrophes and successes. The global community experience these fluctuations and the human race, like other animate species, feel the impact of these adverse fluctuations.

Recently, there has been a growing concern over the relationship between religion and climate change. Many Scholars have stressed the importance of religion in understanding and addressing climate change. However, little is known about the relationship between Muslim communities and climate, or rather between Islam and

Islamic University of Technology (IUT) Bangladesh

Corresponding Author

OMAR JAH PhD

E-mail: cajetannnaocha@gmail.com

climate change. Globally, Islam is seen as a universal religion embraced by about 1.8 billion adherents, and there is a strong concentration of Muslims in regions particularly affected by global warming. In recent years, there has been a rising consideration of religion in the field of climate change research. Several Islamic scholars, scientists and researchers have developed much interest in research focusing on the relationship between Islam and climate change. The increasing focus on culture, values and worldviews in research on climate change appears to have motivated interest in religion.

It has been argued that there is a fundamental need to understand the role of religion in order to fully grasp the cultural dynamics of climate change.² Some scholars from the field of religious studies have made strong claims about the potentials of religion in addressing human-induced environmental challenges. Religions shape the worldviews and moral attitudes of their adherents and how they approach nature. Religious leaders as well as organizations often enjoy high credibility and have important voice in public debates and can influence political decision-making through their different networks. In addition, some religious institutions have massive financial and organizational resources, such as media networks, that they can mobilize to promote transformation towards more environmentally-sustainable societies.

The extent to which religion, particularly Islam, has contributed to climate change mitigation still remains an open question to many. Not much is known about the views of Islam on climate change. Despite the fact that many of the regions where most Muslims live are highly vulnerable to climate change, and that Islam often assumes a great societal relevance in these regions, only few social science studies have addressed the relationship between Islam and climate change. It is against this backdrop that this study aims to provide an insight into the views of Islam on climate change and the potentials of Muslim communities to facilitate climate change mitigation in different regions of the world. The study also seeks to assess the impacts and challenges of climate change and make recommendations to mitigate them.

What is Climate Change?

Scientists, researchers and affected peoples around the world have reported changes beyond the natural variation of temperatures on land and in the ocean, as well as abnormal trends in the timing of seasons, in rainfall patterns, and in many other systems. These abnormal changes result from global warming due to an increased greenhouse effect caused by the vast amounts of greenhouse gases added to the atmosphere by human

activities. The term 'global warming' is often used interchangeably with 'climate change' and it refers to the rise in average global temperatures, which is linked to significant impacts on humans, wildlife and ecosystems around the world.³ The concentration of greenhouse gases has been on the rise steadily since the time of Industrial Revolution as a result of human activity, primarily the burning of fossil fuels and changes in land use, leading to increasing global temperatures. The average global temperature on Earth is directly linked to the concentration of greenhouse gases in the atmosphere. Small rises in temperature have major impacts on weather and climate systems, causing detrimental damages to life and society.⁴

Climate change is a broad term which refers to changes in the earth's climate at local, regional or global scales. It can also refer to the effects of these changes. Climate refers to average weather conditions over a long period of time (months, years or even centuries). According to online dictionary, climate is generally defined as "the composite or generally prevailing weather conditions of a region such as temperature, air pressure, humidity, precipitation, sunshine, cloudiness and winds throughout the year, averaged over a series of years". Climate could also be seen as an average weather of an area or environmental factors of an area. These include quantity of light, temperature, humidity, wind, gases, water etc. which average for about 30 years. The change in environmental conditions of an area over long period of time is called climate change. These changes affect the agriculture, migration of animals, hydrological cycle, thermal gradient between the poles and equator, wind pattern, distribution of rainfall etc. over time. Anthropogenic activities are responsible for depletion of resources and upsetting the climate and the delicate balance between the various components of the environment. These activities include the excessive use of fossil fuels, deforestation and desertification, loss of fertility of soil, rapid industrialization, and increase of automobiles.⁵

The earth's climate can be conceived as an elaborate balancing act of energy, water, and chemistry involving the atmosphere, oceans, ice masses, biosphere and land surface.⁶ In recent times, the term 'climate change' is most often used to describe changes in the earth's climate, driven primarily by human activity since the pre-industrial period (c.1850 onwards), particularly the burning of fossil fuels and the removal of forests, resulting in a relatively rapid increase in carbon dioxide concentration in the earth's atmosphere.⁷ It refers to long term shifts in temperature and weather patterns. These

shifts may be natural, but since the 1800s, human activities have been the main driver of climate change, primarily due to the burning of fossil fuels like coal, oil and gas, which produces heat-trapping gases.⁸ Simply put, global climate change refers to any significant change in world climate over a period of time. Such a significant change may include any or all of the following among others: unpredictable rainfall patterns, rising temperatures and drought, and increased likelihood of hazards such as floods, landslides and severe cycloids which may result in hurricanes and typhoons.⁹ Natural variations in climate, including oscillations in large scale wind patterns, changes in oceanic circulation and periodic fluctuations in the earth's orbit occur on timescales ranging from years to decades to millennia.

Predominant scientific views point to human activity as the main driver of climate change. The Intergovernmental Panel on Climate Change (IPCC, 1990) Report notes that human activities are substantially increasing the amount of greenhouse gases in the atmosphere.¹⁰ Some Muslim environmentalists identify the modern economic system as the core source of the problem. For example, Muslim Leaders Survey (MLS) attributes climate change mainly or partially to anthropogenic factors, identifying industrial production, deforestation, burning waste and fossil fuel-based transportation as the main cause of climate change.¹¹ Ehezue notes that since the 1700s, human activities have substantially increased levels of greenhouse gases in the atmosphere. It is expected that increases in the concentrations of greenhouse gases will significantly enhance the atmosphere's capacity to retain infrared radiation, leading to an artificial warming of the earth's surface.¹²

As human activities increase the concentration of other greenhouse gases in the atmosphere (producing warmer temperatures on earth), the evaporation of oceans, lakes and rivers, as well as water evaporation from plants, increases and raises the amount of water vapour in the atmosphere. In addition, carbon dioxide constantly circulates in the environment through a variety of processes known as the carbon cycle. Volcanic eruptions and the decay of plant and animal matter both release carbon dioxide into the atmosphere. Oceans, lakes and rivers absorb carbon dioxide from the atmosphere. Through photosynthesis, plants absorb carbon dioxide and use it to make their own food, in the process incorporating carbon into the new plant tissue and releasing oxygen to the environment as a byproduct. In order to provide energy to heat buildings, power automobiles and fuel electricity generating power plants,

humans burn objects that contain carbon, such as the fossil (petroleum) fuels and oil, coal and natural gas, wood products and some solid wastes. When these products are burned, they release carbon dioxide into the air.

Also, humans cut down huge tracts of trees for lumber or to clear land for farming or building. Much of the timber and wooded plants are also used for cooking as firewood in developing countries. Through this process (deforestation), carbon stored in trees can be released and this significantly reduces the number of trees available to absorb carbon dioxide. Thus, it is obvious that tree felling in forests around the globe is a major factor of climate change. The increasing destruction of forests that form a precious cooling band around the earth's equator is one of the main causes of the current global climate change. In Africa for instance, deforestation has been in existence for years with tree canopies removed in favour of agriculture, plantations, estate development, road construction and other non-forest-friendly projects. Study research revealed that West African rainforest deforestation reduces precipitation over neighbouring trees by about 50 percent due to increased surface temperatures of cropland, which adversely affect the formation of rain clouds. Besides, many natural processes produce methane which, according to scientists, has more than doubled in the atmosphere since 1750. Though atmospheric concentrations of methane are far less than carbon dioxide, it is an extremely effective heat-trapping gas as one molecule of methane is nearly 30 times more efficient at trapping infrared radiation radiated from the earth's surface than a molecule of carbon dioxide. Other greenhouse gases that affect the earth's surface include Nitrous oxide, ozone, fluorinated compounds like chlorofluorocarbon (CFCs) and Hydro chlorofluoro-carbon (HCFCs). The emission of these substances into the atmosphere contributes to global warming and climate change.

Environmental scientists have warned that increase in the aforementioned greenhouse gases and pollutants in the atmosphere makes the earth a warmer place. Thus, they have predicted a global rise in average temperature of 1.4 to 5.8 Celsius degree (2.5 to 10.4 Fahrenheit degrees) in the 21st century. During 1985-1987, the world's leading atmospheric scientists projected that humans might experience "in the first half of the next century a rise in global mean temperature which would be greater than any known temperature in man's history as a result of the increasing concentration of greenhouse gases in the atmosphere."¹³ Average temperatures have in fact been rising and the 1990s were the warmest decade

on record, while 2005 was the warmest year on record.¹⁴ The continued rise of global temperature portends danger to the global community. This danger manifests in the impacts and challenges of climate change on human society.

Impacts and Challenges of Climate Change

The consequences of climate change are varied across regions of the globe and may include, among others, intense droughts, water scarcity, severe fires, rising sea levels, flooding, melting polar ice, catastrophic storms and declining biodiversity. Climate change affects human health, agriculture and food production, housing, safety and work. Its impacts are encompassing and some areas of the global community are more vulnerable to such impacts, such as people living in small island nations and other developing countries. Conditions like sea level rise and saltwater intrusion have advanced to the point where people are at risk of famine.¹⁵

According to the 2007 report of the Intergovernmental Panel on Climate Change (IPCC), an international body set up in 1988 by the World Meteorological Organization (WMO) and the United Nations (U.N.) to evaluate scientific and technical information related to global warming and climate change and provide advice to the international community, the scientific consensus on climate change was that average global surface temperatures had risen by 0.74 (1.33° F) in the past century, with most of the warming occurring over the last fifty years principally due to the observed increase in anthropogenic greenhouse gas concentrations. The World Meteorological Organization had earlier in 2002 observed that the earth's ten warmest years on record occurred after 1990, and that the warmest in the observational record were 1998 and 2005. Also, the National Academy of Science report of 2001 to the American White House had it that the global mean surface air temperature increased in the 20th century between 0.4°C and 0.8°C (0.7° to 15°F), while the oceans warmed by about 0.05° (0.09°F) over the water layers extending down to 3.048 meters.¹⁶

In its fourth Assessment Report in 2007, IPCC also predicted an increase in the global average surface temperature of 1.8° to 4.0°C (3.24° to 7.2°F) by 2100. It was also reported that there was an increase in heat-wave frequency, intensity and duration, and a 2 to 4 percent increase in the number of heavy precipitated events across the Northern Hemisphere during the 20th century. In 2005, there were twenty-seven recorded storms, fifteen of which were hurricanes. Several of these powerful hurricanes, most notably Hurricane Katrina, made

landfall across the United States, Caribbean and Central America, resulting in over 2,500 fatalities and over one hundred billion dollars in damages. Scientists connect increases in tropical storm intensity to warmer surface ocean temperatures, which in the tropics provide the energy that fuels tropical storms. Winds from storms are devastating and serve as catalyst in producing storms surges associated with large number of casualties.

Suffice it to say that the effects of global climate change extend across all sectors of human society: health, economy, politics and even international relations. Increased humidity worsens rural-urban air pollution; malaria and dengue are spread by vector-borne infections and mosquito population increase with moisture, energy sources and water resources are stressed by storms, storms damage agricultural sectors, threaten food supplies, and potentially higher sea levels would displace millions of "climate refugees". Besides, natural ecosystems are threatened as climate change may result in the loss of biodiversity, increase extinction rates for vulnerable species and cause a decline in the viability of important ecosystem. Also, sea level rise and the warming of the ocean will further harm coral reefs, which provide the greatest biodiversity of any ecosystem. The growing seasons in temperate regions will shift poleward and move to higher elevations. Signs of spring will shift as well, as trees and flowers and insects will emerge and birds will lay eggs earlier in the year. Plants and animal species labelled 'critically endangered' will become extinct and the majority of those labelled 'endangered' and 'vulnerable' will come closer to extinction.¹⁷

The impacts of climate change across the regions of the world are extensive. Coastal settlements across much of Africa are experiencing erosion and inundation. In Asia, tens of millions of people in low-lying coastal areas are being displaced by rising sea levels, while mangroves and coral reefs are at risk. The rising ocean is consuming many pacific island countries. In Latin America, home to some of the largest concentrations of biodiversity, climate change is resulting in the eradication of countless vulnerable species. Agricultural productivity in Latin America and Africa is declining leading to food shortages for many impoverished countries. Water supplies are expected to become less in many parts of the world as global warming and climate change gather momentum. For example, drought in some West African countries, Ethiopia and Somalia have led to a series of grave consequences – famine resulting from critical food shortages, a great deal of climate refugees, diseases etc. Acknowledging the danger posed by climate change and

the challenges thereof, Rob Droucen, head of the International Committee of the Red Crosses, Regional Resource Network, notes,

We are confronted with the challenges of climate change and environmental degradation, which may lead to a shortage of clean drinking water, a lack of suitable water for agriculture, air pollution and damage to the properties and infrastructure.¹⁸

Succinctly put, the twin phenomena of global warming and climate change which have been fueled more by anthropogenic (human-induced) than natural factors, have produced and are still producing observable and deleterious effects. Such effects include exponential global increases in land and ocean surface temperatures which in turn have led to melting of ice in the frigid zones, unpredictable regimes of rainfall and accelerated incidence of devastating hurricanes. Our world is also experiencing from the thawing of Arctic ice rising sea levels, promoting disastrous floods. Severe temperature changes are also generating droughts, loss of vegetation and reduced land use activities as well as low agriculture and livestock production and famine. Ecological changes that result from climate change are also inducing the extinction of various flora and fauna species. In all, there is established decrease in human life expectancy due to increased heat waves leading to various health hazards, including stroke and protracted incidence of malaria and vector-borne diseases.

In the face of these adverse effects and in the context of this study, one should be curious to know how Islam responds to global warming and climate change in order to obviate or at least mitigate their impacts on human society.

Islam and Climate Change

Islam means total submission to the will of Allah (God), the most Gracious, the most Merciful. It is a monotheistic religion that teaches the supremacy of only one God, the creator of the universe. The adherents (Muslims) believe that Islam is the true religion revealed to humanity through Prophet Muhammed and a religion based on complete, holistic way of living that covers every aspect of life. Thus, Islam leaves no stone unturned as it teaches mankind how to behave in every area of life: individual, social, material, moral, ethical, legal, cultural, political, economic and global. Muslims believe in total surrender of their will to the will of the supreme creator, Allah, and the practice of their faith in accordance with the revelations made to Prophet Muhammed as contained in

the holy Quran. The Quran is a book of guidance for all adherents and contains some scientific facts about the relationship between man and his environment, providing enough evidence and proofs of what God has ordained, *"This is the Book (the Quran) whereof there is no doubt, a guidance to those who are all al-muttaqun (pious believers of Islamic monotheism who fear Allah much (abstain from all kinds of sins and evil deeds which He has forbidden) and love Allah much (perform all kinds of good deeds which He has ordained))."*¹⁹ The Quran contains encompassing principles revealed to Prophet Muhammed, to guide all Muslims on all aspects of life as ordained by God.

Religiously observant Muslims share belief in God as revealed through the Prophet and draw on two main scriptural sources: the Quran, understood as God's revelation to the Prophet, and the Sunna, representing a collection of hadiths; accounts about the practices and teachings of the Prophet. Based on these practices and teachings, many Muslim writers have harped on the connection between Islam and the human environment, stressing the interconnectedness between the teachings of the Quran and the ecosystems. For instance, Seyyed Hossain Nasr, drawing on the unity of the universe, stressed the connections between environmental degradation and the spiritual and moral crisis of the modern world, pointing out that "the harmony between man and nature has been destroyed" due to "the destruction of the harmony between man and God."²⁰ Many Muslim environmentalists draw upon the Quran and the Sunna to generate environmental principles from them, thereby creating ecological interpretations of Islam and a set of Islamic environmental ethics. Islamic scholars identify four main environmental principles contained in the Quran which relate to Islamic teachings on the environment, and by extension climate change. These are Tawhid, khalifa, mizan and maslahah, which guide all Muslims on their relationship with their environment.

Tawhid refers to the oneness of God as expressed in the first words in the profession of faith: "There is no God but God (Allah). Everything comes from this one source of life and is connected to it, including nature." This principle clarifies the unity of all creation to which all humans belong, and affirms the interconnectedness of the natural order. It emphasizes the belief in one God who created the Heavens and Earths, and who has entrusted man with the duty of taking care of the environment as man is "selected to be a caretaker or steward (khalifa) on earth"; *"Believe in Allah and His Messenger (Muhammed) and spend of that whereof He has made you trustees. And such of you as believe and spend (in Allah's way) theirs will be a great reward."* Khalifa dwells on

the relationship between Islam and ecology and interprets humans' role as vicegerents of God on earth.

As stewards, God afforded mankind with trusteeship over all creation with promise of great reward. Man was granted dominion over all creation and made a representative of God on earth. Unfortunately, mankind deviated from this assigned role and failed in his responsibility of protecting God's creation by causing mischief on the created order, the environment, leading to climate change. Human activity is putting much strain on the natural functions of the earth that the ability of the planet's ecosystems to sustain future generations can no longer be guaranteed. A.S. Abdellah notes, *"our species, though selected to be a caretaker or steward (khalifah) on the earth, has been the cause of such corruption and devastation on it that we are in danger of ending life as we know it on our planet. This current rate of climate change cannot be sustained and the earth's equilibrium (mizan) may soon be lost."*²¹

Excessive pollution from fossil fuels and other greenhouse gases threaten to destroy the gifts bestowed on mankind by God – gifts such as a functioning climate, healthy air, regular seasons and living oceans. Human activity and its attendant climate changes that are occurring with adverse impacts on the climate system is a gross violation of the trusteeship. Though man is declared as God's steward on earth and given dominion over all created things, the Holy Quran was quick to warn and restrain mankind from overstepping his bounds, *"Assuredly the creation of the Heavens and the Earth is greater (matter) than the creation of men: Yet most men understand not."* Thus, the Quran repeatedly warns mankind against causing mischief (isfad) on the environment, *"Make not mischief on the Earth"* (Surat al – Baqarah 2:11). To many Muslim environmentalists, obeying Allah's injunction by not over-exploiting and wasting natural resources is truly serving God, and disobedience is what has brought calamity in form of climate change.

Islam is keen in protecting the environment with all its components by creating a complete conception of life and its system, and what it requires of development according to fixed rules that do not change with the change of time and place. This is what gives Islamic environmental principles the status of validity that achieves happiness and prosperity for its members in this world and the hereafter. Islamic principles of the environment are not a fantasy nor a myth from the myths of the Greeks and Romans, but rather it is part of instinct which God has put in humans; a sincere approach to the creator, the one who created everything. The Almighty said: {So be steadfast in faith in all uprightness O Prophets - the natural Way of Allah which He has instilled in all people. Let there be no change in this

creation of Allah.

In terms of environmental pollution and pollutants, in addition to the general principle of forbidding mischief on the Earth as earlier stated, the Prophet specifically made mention of dangers of polluting waters. In the Muslim Collection, in two traditions reported by both Qutaybah b. Said from Abu Hurayrah and by Mu'adh b. Jabal, the Prophet warned the people of the dangers of three cursed things: "defecation or urination in the water sources or on the road or under a tree". He prohibited urination and defecation anywhere near or in water source and pointed out the repugnance of using places where people rest, collect water or clean themselves as a toilet area. He also warns of the dangers of drinking from, or bathing in contaminated water. This prohibition may be extended to any water pollutant, such as industrial waste, and household rubbish that may adversely affect human health or endanger the environment. However, what was more revolutionary in this aspect is the idea of rejection of noise pollution.

In the aspect of environmental conservatism in Islam, the religion is highly against deforestation and prohibits unnecessary cutting of trees as is evident in the following Hadith narrated by Abdullah ibn Habashi that Prophet Muhammad (SAW) said: "He who cuts a lote-tree [without justification], Allah will send him to Hellfire." (Abu Dawud). According to the teachings of Islam, the essential elements of nature – earth, water, fire, forests, and light – belong to all living things and not only to the human race. Islam has emphasized the importance of preserving the environment and protecting natural resources.

A number of contemporary Muslim thinkers have contributed in the discourse; reference is particularly made here to Seyyed Hossein Nasr. In his short book, *Man and Nature: The Spiritual Crisis of Modern man*, Seyyed Hossein Nasr takes a look at the relationship between man and nature and the spiritual crisis that inflicts modern man in his "war against nature". In examining ecological crisis, war, and industrial failure, Nasr argues that modern science has lost touch with the sacred in its applications. Rather than being rooted in the unified outlook of traditional man along with his religious traditions, modern man sees the world through the eyes of a crass materialism, scientism, and positivism. It is this lack of worldview which Nasr believes is the spiritual crisis behind the troubled relationship between man and nature. Nasr is quoted to have said:

I would say that a kind of Islamic environmental consciousness goes back to the late 70s and early 80s. He notes that there is now an "authentic Islamic

environment” in many major Muslim countries. Turkey, Iran, Indonesia and Malaysia are leaders in this respect with Egypt, Pakistan, Morocco and Nigeria also seeing significant activism.

This quotation is indicative of a generally late Muslim responsiveness to the Islamic theoretical framework. The environmental and climatic utterances quoted earlier were made 1400 years ago and it was expected that it would have led to an earlier Muslim collective climatic awareness with advanced strategies and policies on environmental conservatism; it was supposed to lead to an earlier Muslims campaign of “Clean Planet” as proposed by Barack Obama, the 44th president of the United States of America. One may pose a question as to why that did not happen, and the answer is simple: it is due to a number of reasons, mainly colonialism. Muslim states could not collectively do otherwise, because Muslim countries have always been rendered objects rather than subjects and players in the world game.

In all, Allah created a perfectly balanced world on the basis of sustainability and circularity. This balance must be maintained by man acting moderately, thoughtfully and justly. Waste, pollution and destruction are the very qualities that Allah abhors. God created the Earth with great perfection and a harmonious equilibrium (mizan). Every detail of creation was made to stand in perfect order and in good relationship with one another, thus explaining the interconnectedness of the ecosystems. The example of the cosmic harmony is illustrated in al-Rahman of the Holy Quran 55:7, *“The Most Gracious! It is He who has taught the Quran. He has created man: He has taught him an intelligent speech. The Sun and the moon follow course... and the herbs and the trees both alike bow in adoration; and He has raised up the heaven and has set a balance that you may not transgress in the balance but weigh things equitably and skimp not in the balance”*.²² This verse reflects the obedient nature of the macro cosmic behavior, including weather and climate. By extension, human beings are enjoined to imitate this inanimate creation in terms of heeding the Divine order in dealings amongst ourselves and between us and our environment.

Unfortunately, human beings have transgressed the earth by causing mischief in terms of polluting the air through emission of greenhouse gases, contaminating the waters, cutting of trees and interfering with the wildlife purposely for luxurious living. Through these actions, the harmonious equilibrium set up by God has been upset and the impacts have disorganized the interconnected creation. Both the Quran and the Hadith emphasize the sacredness of nature and enjoin all Muslims to treat all creation of God as sacred, including

natural resources. The Prophet's teaching on environment is indicative of his environmental awareness and love for green nature: *“If it happens to one of you that the judgment Day is about to strike and in his hand a seed (of a tree) let him sow it.”* All the Prophet's teachings on environment and nature were geared towards benefitting mankind and for public interest (maslahah). This Islamic principle pursues a sustainable achievement of good, welfare, advantages and benefits for all creatures and prioritizes the public welfare over individual, private interests. God created the universe and made man His representative. The earth was created as a blissful abode to serve the interest of all created things. But greed, avarice and self-aggrandizement have compelled man to abuse God's original plan through failure to consider the interests of the future generations. Self-pursuit for immediate gratification is what led mankind into abusing nature, leading to global warming and climate change. Our environment has been over-exploited to the extent that our unwise and shortsighted use of the natural resources gifted to mankind by Allah, has resulted in the destruction of the very conditions that would have made our lives on earth comfortable.

Thus, worried by the adverse impacts of the twin phenomena – global warming and climate change – and drawing on the aforementioned Islamic principles, combining them with scientific insights on global warming and climate change, Islamic Leaders in a gathering in Istanbul, Turkey in 2015 made a categorical Declaration on climate change, calling on all Muslims all over the world to play an active role in combating climate change and urged nations' governments to conclude an effective universal climate agreement to mitigate the effects of climate change. The Muslim leaders further called on the people of all nations and their leaders to phase out greenhouse gas emissions as soon as possible in order to stabilize greenhouse gas concentration in the atmosphere, and to commit themselves to 100% renewable energy and / or a zero-emission strategy as early as possible. They specifically called on richer nations and oil producing states to lead the way in phasing out their greenhouse gas emissions as soon as possible.²³ This will ensure and create a clean environment not only for the present generation but also for future generations. Christiana Figueres, head of International Red Crosses, reiterated the importance of the Declaration when she said, *“A clean energy, sustainable future for everyone ultimately rests on a fundamental shift in the understanding of how we value the environment and each other. Islam's teachings which emphasize the duty of humans as stewards of the Earth and the teacher's role as an appointed guide to correct behavior, provide guidance to take right action*

on climate change.”²⁴

The Istanbul declaration no doubt, integrates scientific and religious knowledge –Tawhid, mizan and khalifa – to make calls to political leaders at the United Nations Climate Change Conference, Faith leaders, businesses, organizations and believers to phase out greenhouse gas emissions as soon as possible. The main theme of the Declaration lies in its religious perspective in addressing environmental issues. There is no doubt this Declaration may create substantial awareness and pressure on countries in the Middle East with high level emission of greenhouse gases and create an impact on Muslim mitigation efforts if only the Imams in mosques are committed to their duty of reminding the ever-increasing number of adherents of their moral responsibilities as taught in the Quran and by the revered Prophet Muhammed.

It is noteworthy that in response to the Istanbul Declaration, and in recognition of the challenges of climate change, various governments and organizations have taken measures to mitigate the adverse impacts of climate change. Governments of Muslim majority countries have signed international agreements and some have started to implement green economy strategies to address climate challenges. For instance, after a long history of climate change skepticism and obstructionism at the United Nations Climate negotiations, Saudi Arabia has begun to diversify its oil dependent economy and has sought to promote low carbon transportation technologies. On its part, the United Arab Emirates is pioneering an urban development project aimed at developing a carbon neutral city in Masdar, Abu Dhabi. Also, many Muslim organizations and leaders have undertaken public activities, launched public statements and advocated for climate policy among governments. One of such public statements is “Islamic Principles for the Conservation of the Natural Environment” compiled by Muslim scholars from Jeddah University, Saudi Arabia. The document stresses environmental policy initiatives centered on Islamic principles which aims at the protection, conservation and development of the environment and natural resources, considered a mandatory religious duty to all Muslims. Besides, many organizations have undertaken reforestation initiatives, recycling, energy efficiency measures, low carbon eco-mosques construction, all aimed at mitigating the effects of climate change. Above all, there is in place the Muslim Seven Year Action Plan on Climate change launched in 2010 to mobilize the Islamic world towards efforts to mitigate climate change with support from various organizations, aimed at promoting green mosques, green hajj as well as environmental training.

These Muslim initiatives have sought to diffuse greater concern about climate change and environmental degradation, and encourage lifestyle changes among the Muslim ummah by drawing on educational programmes, workshops, information guides and newsletters for enlightenment and awareness creation. The Green Hajj Guide, for instance, is aimed at creating environmental concern among pilgrims. Generally speaking, as can be seen, Islam like many other religions of the world has concerned itself with the challenges of climate change and the Quran has been a good guide to Muslims in terms of their relationship with their environment.

Conclusion

The twin phenomena of global warming and climate change which have been fueled more by anthropogenic than natural factors, have produced and are still producing observable and deleterious effects. Such effects include global increases in land and ocean surface temperatures which in turn lead to melting of ice in the frigid zones, unpredictable regimes of rainfall and accelerated incidence of devastating hurricanes. Severe temperature changes are also generating droughts, loss of vegetation and reduced land use activities as well as low agriculture and livestock production and famine. Ecological changes that result from climate change are also inducing the extinction of various flora and fauna species. There is established decrease in human life expectancy due to increased heat waves leading to various health hazards including stroke and protracted incidence of malaria and vector-borne diseases. In the face of these global challenges occasioned by climate change, Islam has provided its adherents (Muslims) with principles and practical guidelines aimed at mitigating the impacts of climate change. Islam provides a standard code of conduct and relationship between man and God's created environment. Man is God's steward on earth and trusted with the responsibility of protecting God's creation. Unfortunately, man has failed in his assigned role as God's vicegerent through his activities on earth which has led to global climate change. In view of this failure and the attendant climate change with its continued adverse impacts on human society, this paper hereby makes the following recommendations as mitigating efforts:

- All Muslims wherever they may be should see themselves as God's steward on earth and accordingly perform their assigned role as encapsulated in the Quran. They should commit themselves to tackling habits, mindsets and root

causes of climate change, environmental degradation and loss of biodiversity in their particular areas of influence, thus following the example of the Prophet.

- Corporate organizations, particularly multinational oil companies, should commit themselves to 100% renewable energy and/or zero emission strategy as early as possible and shift investments towards renewable energy. To this end, gas flaring in oil-producing states should be prohibited.
- Peoples of all nations and their leaders should commit themselves to the task of phasing out greenhouse gas emissions as soon as possible in order to stabilize greenhouse gas concentration in the atmosphere.
- The richer nations should lead the way in phasing out greenhouse emissions as early as possible and provide financial and technical support to the poor nations to achieve the phasing out of greenhouse gases as early as possible.
- All religious groups, as well as corporate institutions and organizations should commit themselves to the campaign on climate change and help to create awareness among their members of the challenges of climate change.
- Media houses, particularly radio and television houses should join the campaign on climate change and broadcast programmes on the challenges of climate change with a view to educating the listening audience.

Endnotes

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