

The Islamic Environmental Health Guidebook

**Entrusted Environment
University of Miami**

2nd Edition

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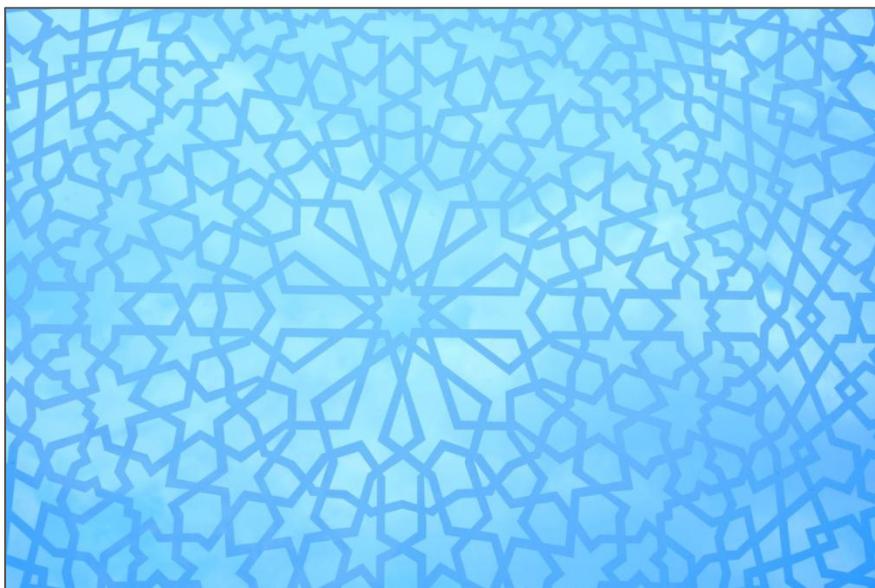
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**Arsht
Ethics Initiatives**

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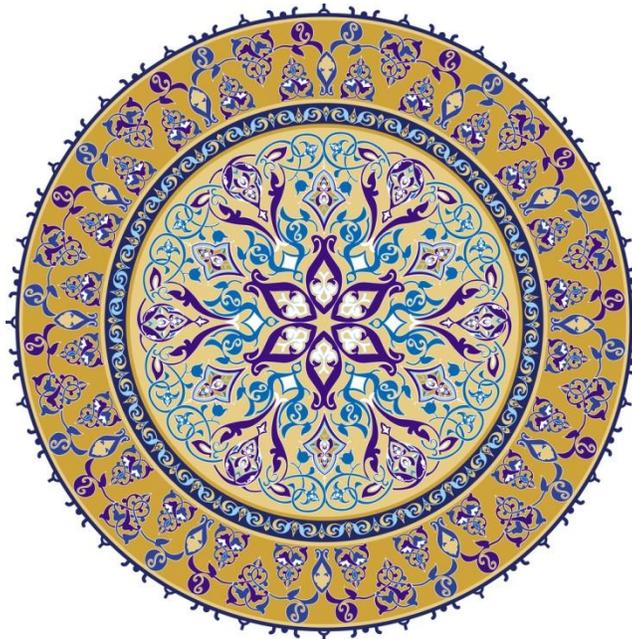
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Purpose Statement

“The Remembrance of God is greater than what follows”

This Guidebook outlines some of the significant aspects of Islamic Environmental Health Ethics to be used by individuals, organizations (governmental and non-governmental agencies), as well as all concerned parties seeking to improve the environmental health situation of the Muslim world. Through Islamic principles, this Guidebook lays foundational concepts, as well as gives practical examples aimed at creating a healthy relationship between Muslims and their environment. These concepts are intended to be used by all (Muslims and non-Muslims) seeking to impact positive change in the environmental health ethics of Muslim individuals and communities using an approach which Muslims already identify with and adopt as a way of life. Although the Guidebook is intended to be used by both Muslims and non-Muslims to motivate an environmental health ethic for Muslims, in order to efficiently communicate the relevant principles and ideas, most of the guidebook sections are written in a manner that presupposes the reader’s understanding of Islam.



Introduction

Environmental health is the impact of the environment on human health, often resulting from the (negative) impact of humans on the health of the environment. Through the study of the environmental health challenges of today, it becomes apparent that many of the critical issues relate to the ethical choices that humans make. These choices can be on the institutional level (such as deciding how a country's nuclear waste will be disposed of or whether current potable water regulation ensures adequate human health), or on the individual level (as when citizens may choose whether they will dispose of their car engine oil in a hole in their backyard or take it to a proper collection site). The examples



are numerous, but the observation is the same: the ethical choices that people make directly influence environmental health on the local and, now more obviously, global level.

The role that religion has played when it comes to solving environmental health challenges of today is not altogether clear. The Gallup International Millennium Survey conducted in 60 countries, which represents 1.25 billion citizens of the world, found that 87% of the people surveyed identified with a religion (Gallup Intl, 2000). In the US, when individuals were asked what they would do if scientists were to disprove a particular religious belief they held, nearly two-thirds (64%) of people surveyed said they would continue to hold to what their religion teaches rather than accept the contrary scientific finding (Masci, 2007). Therefore, it is obvious that it would be extremely valuable to have religion on the same side of environmental health ethics in order to implement change.

In addition, one should also consider that individuals are more likely to take action based on ideas and thoughts which they or somebody they respect have developed, as opposed to ones being dictated to them by a foreign party. Dale Carnegie, in his classic book, *How to Win Friends and Influence People*, pointed out in his list of principles to win people over to your way of thinking

that one must allow the other person to feel that the idea one wants this person to adopt is his or hers (Carnegie, 1936). In the context of religion and environmental health ethics, when possible, effective recommendations need to be honestly presented as being ideas with which the individuals already identify, as opposed to a foreign concept being dictated onto their culture. This fundamental maxim is a commonly cited example of why many western environmental and health initiatives fail when deployed in the developing world (NYT, 2005)

This method of utilizing religion to encourage ethical environmental health decisions may be applied in the context of any faith or ideology to varying degrees. However, this idea would be most effectively deployed in a region that is dominated by the same faith and also classified as “developing” since this is where serious problems due to harmful environmental health practices are most obvious.

The current estimated Muslim population in the world, which is predominantly located in developing countries, is 1.2 billion (Britannica, 2008) or approximately 25% of

the world’s population. In addition, Muslims in general are one of the most committed communities to their faith. This is evident from the Millennium Gallup poll that portrays the countries that are predominantly Muslim as having the highest % in terms of weekly attendance of religious service (82%) and in the importance of God in their life (97%) (Gallup Intl, 2000). Hussein A. Gezairy, Regional Director for the Eastern Mediterranean Region of the World Health Organization (WHO), stated that “Religion has a strong influence in the Eastern Mediterranean Region. Many of the principles of Islam call upon people to look after their health, to avoid health hazards and risks, and to raise their standards of hygiene” (WHO, 1988). In addition, a recent study in Egypt (90% Muslim) concluded that *“religious teachings and religiosity are shown to be associated with pro-environmental behavior, thus lending support to the presence of an Islamic environmental ethic”* (Rice, 2006).

The concept of using Islam as the basis for environmental health ethics has demonstrated significant historic and recent successes. One recent example is in Yemen (97% Muslim), where a cartoon character was used to motivate the country’s citizens

to conserve water using the Islamic concept that water is a “mercy” and “blessing” of God that must be maintained (Hill, 2008, and Yemen Embassy, 2004).



Another successful program using what a BBC report termed “Eco-Islam” took place in Zanzibar, Tanzania, where local fishermen were killing off fish populations and coral reefs by using dangerous techniques such as dynamite. Established governmental bans had little impact until finally coupled with the support of religious leaders who used the Quran to advise fishermen that the way they were treating

the ocean and its creatures was in complete opposition to the teachings of Islam. One local fisherman summarized neatly why the religious message has succeeded where government decrees failed: “It is easy to ignore the government, but no one can break God's law” (Dickinson, 2005)

Therefore, it is clear that there is much more potential for programs/strategies to increase environmental health ethics from an Islamic perspective. In the global village we live in today, this will mean significant benefit, not only for Islamic societies, but also for the world as a whole. However, this approach will require a comprehensive understanding of Islamic principles, more widely usable practical applications, and most importantly, effective communication of these principles and applications.

The Muslim and the Environment: Foundational Concepts

Creator and Creation

Everything that is in existence in our world falls into one of two categories, without a third. The first is the category of “Creator”. This category is filled by One, and no other. This One is one in every meaning of the word including neither being divisible nor being composed of multiple elements. Simply and profoundly, One. This One is termed in Arabic regardless of creed (i.e. word used by Arabic speaking Muslims, Christians, etc) as “Allah” and can be found in ancient and some contemporary languages as a derivative of the same term. Another word that is often used when speaking in English instead of “Allah”, is the term “God”. However the term Allah is preferred due to the fact that this term has a very specific meaning leaving no room for confusion. On the other hand the word “God” means many things to many people of many times and places. In addition, the term God has a gender and hence the term Goddess. The term God is also used as part of other terms such as Godfather and Godmother and can be made plural by adding the letter “s”. However these qualities do not apply to the Arabic term

“Allah”. Allah is neither a male nor female, as these are created human qualities, not to be applied to the Creator. The term “Allah” linguistically is in singular form and cannot be made plural. This term also has never been used for any other meaning but to refer to the One, Unique, Independent, Creator and Sustainer of everything that exists.

The second category of existence is “Creation” and this includes absolutely everything besides Allah. Anything that is not Allah, from a stone to an animal or human, to a thought or a concept like space/time, to even a vacuum in space is creation. This means that it has no independent existence, as is the case with Allah, but came into existence and stays in existence only due to the will of Allah. Creation may then be subdivided into either imperceptible or perceptible creation. The terms perceptible and imperceptible here refer to a human soul being able or lacking the ability to perceive the creation with its 5 basic senses. Imperceptible creation would include thoughts, ideas, and emotions. It would also include many of the matters of the “unseen” world which exists in

dimensions above our four dimensional world of space and time. The fact that this imperceptible world exists beyond the 5 senses is known to us through Messengers and Prophets sent from Allah throughout the ages. Our belief in their existence despite the fact that we are unable to perceive them with our 5 senses is a matter of faith which differentiates a believer from a non-believer in Allah and His Messengers/Prophets.

Imperceptible Creation.

However this faith in imperceptible creation is not based on irrational evidence but on an undeniable fact and that is the fact that one has recognized “rationally” the existence of a Creator. Once one recognizes the existence of the Creator than one believes in what the Creator has informed of including the existence of imperceptible creation. One comes to the conclusion of the existence of the Creator by looking around and within one at the “effects” of this Creator i.e. all of perceptible creation stands as proof for the existence of the Creator. This step of looking at Allah’s signs in order to learn the truth is mentioned often in the Quran as in verse 41:53: *“Soon will We show them our Signs in the (furthest) regions (of the earth), and in their own souls, until it becomes*

manifest to them that this is the Truth. Is it not enough that thy Lord doth witness all things?” The notion of knowing of something’s existence (i.e. Allah) without perceiving it with the 5 senses but rather observing its effects is something humans have accepted for all time. For example, I am unable to see, smell, touch, hear, or taste my soul, however I have no doubt that it exists. The effect of my soul is most apparent when the soul ceases to be present in the physical body therefore leaving it as a rotting corpse. Therefore, I know of this imperceptible soul’s existence from its perceptible effects i.e. the functioning of the body, my emotions, thoughts, etc.

Another concept which may clarify this matter is the rule that: one’s perception of something is not a pre-condition for that something’s existence. Allah gives us many such examples in our lives so that we can use it to understand His existence as well as that of the imperceptible world. A few centuries ago microorganisms were non-existent as far as humans were concerned because we could not perceive them with our 5 senses, until Allah gave us the means to develop tools to see this plethora of existence all around and inside of us.

We therefore can safely say that they were in existence in the past although we simply could not perceive them. There are many such examples as for example, something being too far to see with the naked eye or sounds at a frequency we cannot perceive, and therefore one can convincingly admit from our experiences that there are many things in existence which one simply does not have the means to perceive. Therefore our lack of “tools” to access the imperceptible world is not grounds for believing it does not exist, however an intelligent mind would observe the effect that point to the existence of something beyond our perception.

Therefore one can come to a rational conclusion from perceptible creation of the existence of the Creator. In addition, by observing creation closely noticing its complexities, beauty, and order one can also infer the attributes of its Creator such as beauty, wisdom, perfection, creativity, mercy, and justice. Once this conclusion is reached it may be rationally and logically accepted that this all knowing, merciful Creator sends Messengers to guide His creation as opposed to simply creating them with no other information provided about why He did so and what they should do as

creation. These Messengers are sent throughout time and are given miracles from the Ark of Prophet Noah and staff of Prophet Moses to the healing power of Prophet Jesus and the Quran of Prophet Muhammad, and they call to a logical uniform message which I myself can conclude from just observing creation and that is that “there is One unique Creator of all creation who is the only one worthy of worship”. The existence of these miracles, the witnessed impeccable character of the Messengers and the rationality of their message should be proof of their truthfulness.

These Messengers also enlighten people by letting them know how one goes about worshiping the Creator and hence living a righteous life according to the commandments of the All-knowing Creator as well as warning them of accountability for their actions by this same Just Creator. This message of worshiping One Creator should appeal to ones innate inclination to worship one God and live righteously. In addition, these Messengers give knowledge to mankind of creation that is imperceptible to them, such as Paradise, Hell-fire, Angels, and the Day of Judgment. Therefore the existence of imperceptible creation should

be accepted not because I can rationally explain its existence with my limited capacity mind but because I accepted, rationally, the existence of an All-Knowing Creator who is transferring this knowledge to me through His Messengers.

Perceptible Creation



On the other hand there is perceptible creation, which is the focus of this discussion, and this is creation that I can see, taste, hear, touch, and/or smell. Knowledge about this type of creation was not only provided to me by the Creator through Messengers but may also be directly perceived at least at the physical level by my basic senses. This category of creation may be further divided into animate and inanimate perceptible creation. Inanimate creation includes galaxies, stars, the earth, water, air, colors, stones, etc. while animate creation includes humans, animals, plants, insects, microorganisms, etc. Perceptible creation as a whole (whether animate or inanimate) may be termed as the

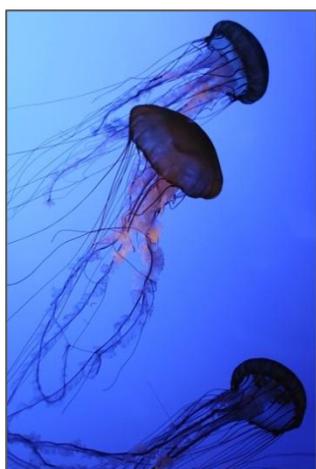
“environment”. **Therefore the environment is defined here as every perceptible creation surrounding one.** In this discussion we would like to further understand the environment including, its relationship to the Creator as well as its relationship to myself.

The Environment is created by Allah.

As mentioned above, Allah is the Creator of everything and therefore that includes the environment.

In the Quran, which Muslims hold to be the final, uncorrupted, literal word of Allah, this concept is clearly encompassed in the verse: “Allah is the Creator of all things, and He is the Guardian and Disposer of all affairs” (Q. 39:62). Everything belonging to the environment is also created with a specific purpose and facilitated with faculties to fulfill that purpose. Allah says “Verily, all things have We created in proportion and measure” (Q. 54:49). Therefore nothing was created in vain, devoid of purpose: “Did you then think that We had created you in jest, and that you would not be brought back to Us (for account)?” (Q. 23:115), “Those who celebrate the praises of Allah, standing, sitting, and lying down on their sides, and contemplate the (wonders of)

creation in the heavens and the earth, (With the thought): "Our Lord! not for naught have You created (all) this! Glory to You! Give us salvation from the penalty of the Fire" (Q. 3:191).



From the bird being designed with lightweight organs enabling its flight to the high boiling point of water allowing it to stabilize atmospheric temperature without evaporating to the comforting sound that wind makes when gently interacting with leaves in a lush forest and finally to the human brain and heart allowing us to choose between right and wrong and worshiping the Creator out of Love and not mere compulsion, all these environmental aspects are designed with perfection and with a specific purpose decided by the Creator. One may also reflect on the air being designed with the ratio of oxygen needed for our existence and free of harmful compounds, or the water fresh and sweet without harmful or displeasing components as Allah says addressing mankind with the royal We: "See you the water which you drink? Do you

bring it down (in rain) from the cloud or do We? Were it Our Will, We could make it salt (and unpalatable): then why do you not give thanks?" (Q. 56:68-70). **This fact that the environment is created by Allah and done so in perfection with a specific purpose and facilitated with the means to fulfill that purpose, is the first fact that must be recognized in this discussion about the environment.**



Therefore when one understands the fact that Allah has created the environment and all that is in it, one will need to stop for a second before intending any "harm" to the environment. "Harm" may be simply understood as a disruption of the created balance. This could include leaving a plastic bag on the side of the road or in the water, releasing dangerous chemicals in the well balanced air that people breathe or not washing ones hand after relieving oneself and therefore introducing illness to the

healthy created body which belongs to the Creator and given to me as with the rest of the environment as a trust to be cared for. When a human makes something whether it be a cake or a computer, he/she prizes and loves that thing that they “created” and does not want it to be dealt with in a way of disrespect or used in a way not intended by the one who made it. One then should reflect on this when intending harm to Allah’s created environment.

The Environment is sustained by Allah.

The next important point to understand is that Allah did not only create the environment and give it the means to exist but He also sustains the environment as mentioned earlier in that Allah is the Guardian of creation (Q. 39:62). Therefore without Allah the environment would come into an immediate state of non-existence as everything is dependent on Allah while He is completely independent from all of creation. Allah says: *“O people! It is you that have need of Allah, but Allah is the One Free of all wants, worthy of all praise”* (Q. 35:15). This is also made even clearer on the Day of Judgment when all comes to an end except Allah: *“All that is on earth will perish: But will abide (for ever) the Face of your Lord, full of Majesty, Bounty and*

Honor” (Q. 55:26-27). The fact that everything is dependent on Allah is also clearly observable in the environment.

One can see for example without the sun being at the distance it is at, or water staying at the surface and not sinking to the core of the earth as Allah warns *“Or the water of the garden will run off underground so that thou wilt never be able to find it”* (Q. 18:41), or the existence of natural nutrients in soil to grow crops *“See you the seed that you sow in the ground? Is it you that cause it to grow, or are We the Cause?”* (Q. 56:63-64), our existence as well as that of other animate creation would be impossible. Therefore our existence is not only based on the mere existence of these and many other factors but their sustainability and hence the need for the “Sustainer”, which is one of Allah’s Names. Such an argument applies also to the rest of the environment all requiring Allah for its continuation in a state of existence.



Again as mentioned, **the fact that the environment is “connected” to the Creator through His constant sustenance would cause a true believer in Allah to reconsider causing any harm to Creation.** One who contemplates will realize that in actuality such harm, although much greater, is similar to one walking into a palace of a powerful king and knocking over his elegant ornaments causing corruption and mischief. A man or woman of intellect would obviously not do this understanding that this is an act of disrespect, injustice, and a cause of possible severe consequences against me as the perpetrator of this crime. If this is the case for a human king, i.e. a creation, than what would one say to the Creator’s kingdom (the environment) which He creates and sustains?

The Environment is a Sign of Allah to me

Not only is the environment a creation of Allah which is sustained by Him, it is also as



mentioned in the introduction a Sign pointing me to Him. The Quran contains a vast collection of verses which states this fact from multiple angles. In one such comprehensive verse, Allah states: *“Behold! in the creation of the heavens and the earth; in the alternation of the night and the day; in the sailing of the ships through the ocean for the profit of mankind; in the rain which Allah Sends down from the skies, and the life which He gives therewith to an earth that is dead; in the beasts of all kinds that He scatters through the earth; in the change of the winds, and the clouds which they Trail like their slaves between the sky and the earth;--(Here) indeed are Signs for a people that are wise” (Q. 2:164).*

Such verses as well as many others call one to contemplate on the environment and

realize that it is a sign which is telling me something about my Creator. For example such creation tells us of Allah's superiority to any of His creation and hence that He alone deserves to be worshiped as opposed to disputed with when He says: "*He has created the heavens and the earth for just ends: Far is He above having the partners they ascribe to Him! He has created man from a sperm-drop; and behold this same (man) becomes an open disputer!*" (Q. 16:3-4). In our times unfortunately such signs when read by people endowed with superficial knowledge (i.e. knowledge limited to the physical world perceivable by the 5 senses) result in a cause of arrogance as opposed to humility in front of the Creator. A scientist may discover the mechanism of how something in the environment functions such as the water cycle or the vastness of the galaxies or the processes of a human kidney and instead of contemplating on their Creator stops there as if he/she created this process and not merely understood something about it.

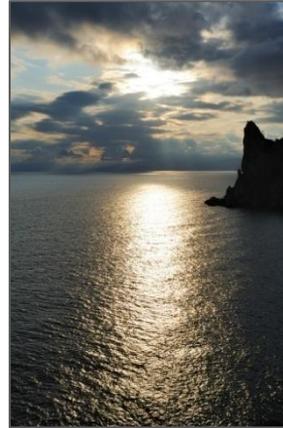
Allah also says for example in inviting people to learn about His mercy through observing the environment: "*And cattle He has created for you (men): from them you derive warmth, and numerous benefits, and*

of their (meat) you eat. And you have a sense of pride and beauty in them as you drive them home in the evening, and as you lead them forth to pasture in the morning. And they carry your heavy loads to lands that you could not (otherwise) reach except with souls distressed: for your Lord is indeed Most Kind, Most Merciful" (Q. 16:5-7).

The environment is therefore a "Sign of Allah" informing me first of His existence through the environment's complex yet beautiful organization which necessitates the existence of a Designer. An intelligent mind would not observe such signs and come to the conclusion that they originated from nothingness or chaos and randomness (which is simply another word for something we do not understand). Such an understanding that organization develops from disorganization independently without an outside force is unprecedented in our physical world. On the contrary, as one of the most strongly established facts in science establishes i.e. The Law of entropy (2nd Law of Thermodynamics): things decay and become disorderly and never the opposite over time. However even the most intelligent minds can be blinded by arrogance.

The environment is also a sign of the many Names and Attributes of Allah such as knowledge, will, power, wisdom, beauty, mercy, creativity, and independentness. In Islam, Allah's essence is understood to be beyond and exalted above any human comprehension and therefore an attempt of understanding this essence will lead to erroneous beliefs (because one can only explain things in terms of what one has perceived in the past) by thinking that Allah is a human, a statue, an animal or other animate or inanimate object such as the earth, light, etc. However His Names and Attributes which He informs us of through His Messengers and Prophets give us more than sufficient knowledge of who He is. These names and attributes are clearly mentioned in the Quran as for example in the following verse which informs of Allah's quality of Generosity, Forgiveness and Mercy: *"If you would count up the favors of Allah, never would you be able to number them: for Allah is Oft-Forgiving, Most Merciful"* (Q. 16:18). Allah also mentions earlier in that same chapter of the Quran some of these favors which He has bestowed on mankind and therefore a call for mankind to be grateful through worship: *"It is He Who has made the sea subject, that you may eat thereof*

flesh that is fresh and tender, and that you may extract there from ornaments to wear; and you see the ships therein that plough the waves, that you may seek (thus) of the bounty of Allah and that you may be grateful" (Q. 16:14).



The environment is also a sign of Allah's Oneness (Tawheed), which is the foundational concept in Islam. This includes the Oneness of His Names and Attributes, Oneness in being Lord, and Oneness in being worshipped. In other words these Names and Attributes are not shared with any of His creation as exemplified in Allah's words: *"(He is) the Creator of the heavens and the earth: He has made for you pairs from among yourselves, and pairs among cattle: by this means does He multiply you: there is nothing like the like of Him, and He is the One that hears and sees (all things)"* (Q. 42:11).

Therefore although humans or animals or other components of the environment may possess qualities such as mercy, creativity,

and generosity, this is not to be understood as being comparable to Allah's infinite Mercy, Creativity, and Generosity. The environment as a sign of Allah's Oneness in being Lord includes His exclusivity in being the Creator, Sustainer, and Judge of Creation. Therefore the environment, through its intricate organization, similarities, and interdependence as well as other characteristics, shows me that it is created, sustained and will return to the same source. Lastly the environment being a sign of Allah's Oneness in being worshipped establishes the fact that because Allah is One in His names and attributes and One in being the Lord, He therefore is the only One deserving of complete gratitude, servitude, and worship. Who else than the one providing me with free daily oxygen, a family, functioning organs, and a gentle earth to travel on should I worship? The environment should trigger such thoughts and pull one to one's Creator.

Once one truly internalizes the reality of the environment in the sense that one of its main functions is to teach me about my Creator this fact alone would cause me to interact with the environment with care and respect. When a messenger brings a message from the King that gives me

information about who that King is and I rip that message in two and treat it with disrespect that is a direct insult against the King. The King of Kings, Allah, has sent me so many signs in the environment teaching me about who He is so that I know Who it is that I am worshipping and to build inside of me a sense of longing to ultimately return to Him.

When the duck stands in defense of its ducklings out of love and mercy or when a mother and father cry at the sight of their newborn baby I recall Allah's mercy and love, because it is the source of the mercy and love I am witnessing. Even observing inanimate objects I can learn about His attribute of Mercy as when He says: "*And He it is Who sends the winds as heralds of glad tidings, going before His mercy, and We send down pure water from the sky*" (Q. 25:48). When an earthquake shakes an entire city I remember His power and when water flows gently over rocks making that soothing sound which people record and listen to in order to help them sleep, I remember His subtle Beauty. All these precious gifts which make up our environment, if corrupted with the human hand of pollution, wastefulness, and greed

mask the sign of Allah's perfection and become a sign of the human's deficiencies.

The Environment Is in worship of Allah

Although the prior points should be sufficient for one to understand the environment's relationship with Allah and hence what my relationship with Allah and His environment should be, an additional critical point must be understood. The environment is not only a creation sustained by Allah which serves as a sign to me of Allah Himself but is also in complete submission and worship of Allah. Allah states in the Quran *"The seven heavens and the earth, and all beings therein, declare His glory: there is not a thing but celebrates His praise; And yet you understand not how they declare His glory! Verily He is Oft-Forbear, Most Forgiving! (Q. 17:44).* Allah also says: *"Do you not see that to Allah bow down in worship all things that are in the heavens and on earth,- the sun, the moon, the stars; the hills, the trees, the animals; and a great number among mankind? But a great number are (also) such as are fit for Punishment: and such as Allah shall disgrace,- None can raise to honor: for Allah carries out all that He wills (Q. 22:18).* These verses point out several

issues. The first is that although everything is in worship of Allah we do not understand the method by which they worship. Reflecting on these verses, one may wonder that maybe the flying of the ducks in a V-shape led by one duck is their mode of praise (worship) with the leading duck serving as the Imam (i.e. person who leads the prayer when Muslims pray) (Soliman, Fadl 2007). Or the chirping of birds in the morning or the swaying of the leaves in the wind, all may be their respective methods of worship. However, this worship is not limited to the animate environment and therefore includes the air, water, mountains, all being in a state of constant worship in their own way. Allah says speaking about Prophet David (peace be upon him) *"It was We that made the hills declare, in unison with him, Our Praises, at eventide and at break of day" (Q. 38:18).* In the presence of the Prophet Muhammad's (peace be upon him) companions, pebbles were heard glorifying Allah in the Prophet's hands (Majma' al-Zawa'id 8:298-299).

The miracle here is not that the pebbles were glorifying Allah as this is the case for all of creation as stated earlier, but that the companions were made to hear it.



Worship means submission and obedience to the Will of Allah. The environment whether it be a microorganism, tree, or stone is doing exactly what it was created for without the chance or option of disobedience and lack of submission. The word “Muslim” in Arabic means one who submits their will to the will of Allah and thereby attains peace, and this is the precise action done by the environment. **Therefore in essence, as Muslim scholars have mentioned, the environment is “Muslim”.** The environment is therefore in a constant state of worship of Allah both “Taskheeran” and “Tasbeehan” (Following the order it was created for and constantly glorifying Allah). However, as also mentioned in the above verses that although the environment is in a complete state of worship of Allah, the human being is not always in worship. Humans have free will granted to them by Allah unlike the rest of the environment to obey or not obey. Allah clarifies this in verse 22:18 where only when talking about

people He mentioned that “a great number” and not all are, in worship.

Therefore Allah created this creature called the human being to, unlike the environment, submit to Allah out of love and by choice and not compulsion therefore making it an honored creation worthy enough for the angels to bow to it (Q. 2:34). Therefore one who is in a state of submission (in arabic “*Istislam*”, derived from the arabic root word *sa la ma* which is the basis for the words *Islam*, *Muslim* and *Silm* (peace)), he/she is in a state of complete harmony with the rest of creation who also is Muslim in a state of *Istislam* or submission. It is only when humans disobey the commandments of Allah sent by His messengers that this harmony is broken and hence we witness pollution, wastefulness, greed, and much corruption in the environment.

If this critical concept is internalized by the human how then should one interact with the environment which is essentially a monumentous congregation of prayer in worship of Allah? How should I interact with someone or something engaged in worship but with utmost respect and trying to make the least amount of disturbance? If I were to walk in a mosque today and see a

line of worshipers in prayer I would slowly tip toe in their presence to not cause the slightest disturbance let alone think of physically hurting them. As such, I must deal with Allah's environment because it is in a state of worship that must not be disturbed. This does not mean one should not utilize the environment for sustenance, clothes, shelter, etc. as a proper usage would not disturb their worship since this usage is what they were originally created for and hence also part of their worship. **However an unjust usage whether it involves polluting the air or water, purposely killing a tree or insect wastefully, or hurting the body of myself or others is in fact a disruption of the environments' harmony with its Creator.** Allah says: *"Do you not see not that it is Allah Whose praises all beings in the heavens and on earth do celebrate, and the birds (of the air) with wings outspread? Each one knows its own (mode of) prayer and praise. And Allah knows well all that they do"* (Q. 24:41).

The Environment is a witness for or against me

Given the environment's natural state of worship of Allah it also is in an "awareness" of the actions of human beings in terms of their worship or disobedience of Allah.

Allah speaking to us about the earth on the Day of Judgment tells us: "On that Day will she declare her tidings (Q. 99:4)". The Prophet Muhammad peace be upon him elaborating on this verse taught that "her tidings" are what the earth witnesses of actions that took place on it of every male or female servant of God (Tirmidhi, Ahmed, An-Nisai'i). Allah speaking to us in the Quran about the reaction of the entirety of the environment to the death of Pharaoh, who had arrogantly disobeyed, says: "And neither heaven nor earth shed a tear over them: nor were they given a respite (again) (Q. 44:29)." Commenting on this verse some scholars mentioned that the space where the righteous lived would lament their loss after their death (Mokhtar, 2009). It is also reported that mountains and parcels of lands communicate with each other and inquire of each other whether today someone passed by you who was in remembrance of Allah. The one who says "I" is considered by other mountains or parcels of lands as privileged (Mokhtar, 2009).



Abu Umama reported that the Messenger of Allah, may Allah bless him and grant him peace, said, "Allah and His angels and the people of the heavens and the earth, even the ants in their rocks and the fish, pray for blessings on those who teach people good." [at-Tirmidhi]. Not only will the animals and inanimate objects respond to our actions, but our very limbs which are again part of this environment in constant worship of Allah will also witness against us for every injustice we have committed towards our Creator through our interaction with His environment. *On the Day when their tongues, their hands, and their feet will bear witness against them as to their actions. (Q. 24:24).*

It is thus clear that the environment is not only actively worshipping Allah but is also actively witnessing our actions and praying for us when we are in accordance to Allah's Law. Knowing this, a Muslim, must again re-consider his/her interaction with those who will witness for or against him/her on

the Day of Judgment. One does his utmost to make sure to find witnesses for him in the worldly court of Law, what should one then do in the grand court of the hereafter. These are witnesses that are neither forgetful nor are they bribed from speaking the truth. Internalizing this concept alone should be sufficient in re-orienting the Muslim to a proper environmental ethic.

The Environment is entrusted to me

The above discussion explains the position of the environment with its Creator as being created, sustained by Allah, being a sign of Allah, and finally being in a consistent state of worship of Allah as well as its active witnessing of human actions; and through reflection should enlighten one as to how one should deal with the environment. But to clarify this interaction more Allah specifically addresses it. Allah did not only create the environment around me, He also created me (i.e. this human soul). He then instructed me about my position within this environment and my role through His Messengers and Prophets. **That role is a role of a trustee of the environment, entrusted to taking care of the environment and to interact with it in a way that Allah has commanded for both the well being of the environment and my**

well being in this world and the next.

Given the definition of the term environment explained in the introduction to this discussion, this includes the responsibility that I have for my own body, other humans, plants, animals, air, water, land, and every other perceptible creation of Allah. Allah says: *“We did indeed offer the Trust to the Heavens and the Earth and the Mountains; but they refused to undertake it, being afraid thereof: but man undertook it; He was indeed unjust and foolish”* (Q. 33:72). Allah also states: *“Behold, your Lord said to the angels: “I will create a vicegerent on earth.” They said: “Will you place therein one who will make mischief therein and shed blood?- while we do celebrate Your praises and glorify Your holy (name)?” He said: “I know what you know not”* (Q. 2:30). And finally another verse states: *“And He has subjected to you, as from Him, all that is in the heavens and on earth: Behold, in that are Signs indeed for those who reflect”* (Q. 45:13). The Prophet Muhammad teaches us that *“Verily, this world is sweet and appealing, and Allah placed you as vicegerents therein; He will see what you will do”* (Muslim 7124).

These verses and Prophetic traditions clearly show the fact that humans were placed as trustees over the environment. In addition

these verses also show as predicted by the angels that humans were also going to cause much mischief and corruption on the earth, however Allah responds to them with the fact that *“He knows what they do not”*. One explanation of this verse may be the fact that although there is to be, as is the case today, much corruption in the earth, including one of the most dangerous and that is that of the environment, there will also be individuals who do not cause corruption but conversely try to properly live up to the trust given to them. These would probably be among those who are among the *many* that do worship Allah as mentioned in the previously cited verse (22:18).



To be a trustee of something means that it does not belong to one but that one is simply entrusted with it and therefore must protect its well being. This is critical to understand as the human being does not own the environment as this would allow him/her to deal with it as they please. The

human is simply entrusted for a certain period of time (the short life of this world), the managing of the environment. This means that the environment is to be used but not abused. Neither is creation sacred in its own right and therefore not to be utilized at all as some have approached the environment such as animals, etc nor is it our possession that we may do with it what we please. Hence the proper usage is that which the Owner has dictated. This results in a relationship between the Muslim and his/her environment of balance, moderation, and respect. A prime example of this is in the Islamic etiquettes of slaughtering an animal. In this case man (the trustee) is to use his extra ability given to him over the animal, but with conditions as dictated by the Owner. Some of these conditions as mentioned by Islamic scholars include, comforting and feeding the animal before slaughtering it, not allowing it to see the knife to be used to not cause it to fear, cutting the necessary veins with the first one or two slides of a sharpened blade to cause least pain to the animal, and even not slaughtering the animal in front of other animals as to not cause them fear.

Allah has made it clear in the Quran that corruption on the earth, which would include all types of interactions in a way

other than the beautiful and perfect way, dictated by Allah, is not beloved to Him. And as a believer in Allah one should want nothing more than to do what Allah loves and therefore gain His pleasure in this life and the next. Allah says, speaking of human's corruption on the earth: "*When he turns his back, His aim everywhere is to spread mischief through the earth and destroy crops and cattle. But Allah loves not mischief*" (Q. 2:205), "*Mischief has appeared on land and sea because of (the meed) that the hands of men have earned, that ((Allah)) may give them a taste of some of their deeds: in order that they may turn back (from Evil)*" (Q. 30:41), "*But seek, with the (wealth) which Allah has bestowed on you, the Home of the Hereafter, nor forget your portion in this world: but do thou good, as Allah has been good to thee, and seek not (occasions for) mischief in the land: for Allah loves not those who do mischief*" (Q. 28:77). "*Do no mischief on the earth, after it has been set in order, but call on Him with fear and longing (in your hearts): for the Mercy of Allah is (always) near to those who do good*" (Q. 7:56). The last verse quoted here is a direct order from Allah not to cause mischief on the earth. This verse also alludes to the fact that such mischief is the opposite of what humans

were created for i.e. worship through supplication and seeking His aid, when He says: "but call on Him with fear and longing". This last verse also mentions that such corruption disrupts the order that He has created as mentioned earlier in the context of the environment being in a state of harmony and order through being in a constant state of worship of Allah.

Allah has mentioned some of the types of corruption of the environment that people will fall into such as corruption resulting from wastefulness. Allah says: "*Verily spendthrifts are brothers of the Evil Ones; and the Evil One is to his Lord (himself) ungrateful*" (Q. 17:27). Allah also praises those who are moderate and are neither wasteful nor stingy: "*Those who, when they spend, are not extravagant and not niggardly, but hold a just (balance) between those (extremes)*" (Q. 25:67). Allah then points us to two specific cases which in today's time are especially critical in the context of wastefulness when He 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 loves not the wasters*" (Q. 7:31). The amount of both food/drink as well as clothes, being two basic necessities of life that are wasted in today's time is shocking.

As much as 50% of food across the developed and developing world is wasted (Lundqvist, 2008) while 6.5 million children under the age of five die in developing countries each year from malnutrition and hunger-related diseases (UNICEF, 2007). Such wastefulness is a critical example of corruption and therefore not in accordance with the human's role as a trustee of the environment.

On the contrary Allah calls us to maintain balance and orderliness: "*And the Firmament has He raised high, and He has set up the Balance (of Justice), In order that you may not transgress (due) balance*" (Q. 55:7-8), "*Verily, all things have We created in proportion and measure*" (Q. 54:49).

Allah also calls us to not only keep from corrupting the environment around us but also to not corrupt the component of the environment closest to us (our bodies). This is done by linking spiritual cleanliness and ones relationship with Allah with physical cleanliness. In Islam both go together as can be show in the Quran where Allah says while ordering the Prophet Muhammad (peace and blessings of Allah be upon him) to proclaim the message of the Oneness of Allah to the people: "*O you wrapped up (in the mantle)! Arise and deliver your warning!*

And your Lord do thou magnify! And your garments keep free from stain! And all abomination shun!” (Q. 74:1-5). Allah also states in the famous verse requiring Muslims to wash the majority of their body up to 5 times a day as well as bath often as both an act of spiritual and physical cleanliness : “O you who believe! when you prepare for prayer, wash your faces, and your hands (and arms) to the elbows; Rub your heads (with water); and (wash) your feet to the ankles. If you are in a state of ceremonial impurity, bath your whole body. But if you are ill, or on a journey, or one of you cometh from offices of nature, or you have been in contact with women, and you find no water, then take for yourselves clean sand or earth, and rub therewith your faces and hands, Allah doth not wish to place you in a difficulty, but to make you clean, and to complete his favor to you, that you may be grateful” (Q: 5:6).



One can contemplate how many diseases were prevented through this ritual carried out by Muslims long before the discovery of microbes and the international organizations outcry for individuals to wash up especially after relieving themselves. A ritual that came at a time when European men and women of virtue so it as a great honor to boast about how many years they have stayed away from water seeing washing as an unholy act. Another elementary practice of Islam is important to mention here and that is washing after one relieves oneself: both ones private area plus ones hands and other parts of ones body. One can contemplate on this alone and how much cleaner we would be if everyone practiced such rituals.

If the Muslim truly internalizes his/her role on this earth as dictated by his/her Creator much of the problems we see today of water and air pollution, food poisoning, lack of personal hygiene, and conservation would be reversed. It is not sufficient to simply “know” these concepts, but to internalize them and live by them is what would cause the truly lasting change.

Allah Sees, Hears, and Knows all that I do.

In order to internalize much of the concepts discussed above a few more points need to be discussed. A Muslim first learns, as discussed above, of Allah’s environment and the purpose of its existence as well as his/her role in this environment. However the drive to act upon this knowledge then needs to be increased through a few additional realities. The first reality is to try to internalize the understanding of some of Allah’s attributes such as the fact that He is All seeing, All hearing, and All Knowing. Allah says: “*He it is Who created the heavens and the earth in Six Days, and is moreover firmly established on the Throne. He knows what enters within the earth and what comes forth out of it, what comes down from heaven and what mounts up to it. And He is with you wheresoever you may be. And Allah sees well all that you do*” (Q. 57:4), “If any

*one desires a reward in this life, in Allah's (gift) is the reward (both) of this life and of the hereafter: for Allah is He that heareth and seeth (all things)” (Q. 4:134), “Let there be no compulsion in religion: Truth stands out clear from Error: whoever rejects evil and believes in Allah hath grasped the most trustworthy hand-hold, that never breaks. And Allah heareth and knoweth all things” (Q. 2:256). From these verses we can see as is in accordance with Muslim belief that Allah Sees, Hears and Knows everything that happens at any time and in any place. The strength of this knowledge is made more real to us by the following verse: “*With Him are the keys of the unseen, the treasures that none knoweth but He. He knoweth whatever there is on the earth and in the sea. Not a leaf doth fall but with His knowledge: there is not a grain in the darkness (or depths) of the earth, nor anything fresh or dry (green or withered), but is (inscribed) in a record clear*” (Q. 6:59). Here Allah describes the extent of His knowledge using an incredible example and that is that of leaves falling. One cannot begin to comprehend how many leaves fall at the same time across the earth. Allah not only knows that these leaves have fallen, but He knows exactly how each one fell, at what angle, etc. A person (creation) endowed*

with knowledge would not speak of his/her knowledge by speaking of small seemingly weak objects such as leaves, but such is the speech of Allah, different than any word written by man, who if were to describe his delusion of possessing knowledge would speak of the limited knowledge of things like mountains, planets, and other grand objects.



Amongst Allah's domain of knowledge is knowledge of everything I do. Every time I cause corruption He sees and hears every part of it. Allah says in verse 57: 4 to bring this reality even closer that *"He is with you"*; that Allah is not a distant entity but very close and watchful. For the believer and one who obeys Allah's commands including those of not causing disorder in the environment, this is a source of comfort, knowing that the All-Merciful is so close to me and guarding me. *"When My servants*

ask thee concerning Me, I am indeed close (to them): I listen to the prayer of every suppliant when he calleth on Me: Let them also, with a will, Listen to My call, and believe in Me: That they may walk in the right way" (Q. 2:186). For the one that intends to cause corruption this should be a warning that He is much closer than this person may think. Allah says: *"It was We Who created man, and We know what dark suggestions his soul makes to him: for We are nearer to him than (his) jugular vein"* (Q. 50:16).

Such a person blessed with knowledge of Allah's nearness to one and His knowledge of my every deed will get to the point that they will feel shyness in disobeying and breaking the trust between me and Allah by tossing waste on the ground, carelessly use water, and continually pollute the air with my old vehicle which never passed the emissions examination.

I will be held accountable for this trust (responsibility) of the Environment

However, for most people such shyness is lacking and therefore Allah reminds us that regardless of our awareness of Him and our level of spirituality in this life there will be either an immense reward or severe punishment for those who break the trust

with Allah. Allah states: *“Know you that Allah is strict in punishment and that Allah is Oft-forgiving, Most Merciful” (Q. 5:98).* Allah’s mercy is beyond any mercy one has witnessed in this life as all this mercy is just a minute portion of His ultimate mercy. However, for those who earn the Most Merciful’s punishment they will be exposed to a severe punishment also like no other seen in this world. No injustice done against the environment including against one’s body, other individuals, plants, animals, inanimate objects will go unaccounted for: *“Then shall anyone who has done an atom’s weight of good, see it! And anyone who has done an atom’s weight of evil, shall see it (Q. 99:7-8)”*. This aspect is incredibly important to understand in a Muslim’s relationship with the environment. A Muslim must understand that just because he/she may think they can get away with things in this life this is not by any means to



be understood as having escaped from the final reckoning. Allah spares people time so that they may repent and turn their evil deeds into good ones, but if left unfixed these will come back to haunt one in the next life.

The reality is that with the “privilege” of free will comes accountability as without free will there would be no accountability as thus would be unfair, a quality impossible to belong to the one whose name is The Just (Allah). Allah will ask me on the Day of Judgment about my trust and whether or not I interacted with the environment, which is a creation sustained by Allah shown to me as a sign of Him and in a constant state of worship, in the manner that He loves or based on my lowly desires of greed and arrogance. This is the test for which this life exists, so that Allah gives us a chance to either obey or disobey and then either rewarded or punished based on the ultimate and complete justice of the All Knowing, All Wise, All Just, and All Merciful Lord. *“Blessed be He in Whose hands is Dominion; and He over all things hath Power;- He Who created Death and Life, that He may try which of you is best in deed: and He is the Exalted in Might, Oft-Forgiving (Q. 67:1-2).*

The Prophetic traditions

The second source laying down Islamic principles after the Quran (which was predominately used to lay down the foundational concepts in the previous section) is the Prophetic Traditions (ahadith). These traditions include anything that the Prophet Muhammad (peace and blessings of Allah be upon him), the model of how one is to live as a Muslim, said, did, or acknowledged. In this section some relevant ahadith (*singular: hadith*) are quoted in order to gain insight on the spirit of the Prophetic traditions in terms of environmental health ethics. This, in no way, is a comprehensive study of ahadith mentioning aspects of environmental health, but merely a glimpse into the teachings of the Prophet Muhammad (peace and blessings of Allah be upon him) which further stress and specify the general foundational principles outlined in the previous section.

Water and Wastewater

Preserving the purity of water is essential in the life of the Muslim. In addition to being essential for drinking purposes, the Muslim needs to preserve the purity of the

water in order to use it for ablution before prayers. As a condition, the water used for ablution needs to be free of color, smell, or taste caused by an impure substance such as human waste, blood, and other substances well defined in Islamic law. If one of the three properties of water (taste, color and smell) are altered due to impurities, this water may no longer be used for ablution and more obviously for drinking. If the three properties are affected, the water shouldn't even touch the body or clothes of the Muslim or come in contact with his/her surroundings. Otherwise, the clothes and the area need to be purified, and this is done using pure water. These teachings are critical because, as is well known, one of the greatest threats on human health is the lack of proper disposal and separation between water and wastewater (a clear impurity in Islamic Law). The following ahadith shed some light on how to preserve water from impurities and hence prevent much human health harm.

Jabir reported: The Messenger of Allah (peace be upon him) forbade urinating in stagnant water. (Muslim)

Abu Huraira reported: the Messenger of Allah (peace be upon him) said: None amongst you should urinate in standing water, and then wash in it. (Muslim)

Prohibition of wastefulness

The following ahadith legislate that it is prohibited for the Muslim to be wasteful when utilizing resources. For example, Muslim's are required to perform ablution (washing/wiping of the face, hands, arms, hair and feet) before daily prayers and to perform a complete washing of the body after such situations as sexual intercourse. However, even with this critical spiritual and physical cleansing process, Islamic Law constrains the amount of water to be used in each of these actions. The Prophet used to perform ablution using an amount of water equal to that which could be carried between the palm of the hands, known in Arabic as "Mud." Contemporary Muslim scholars approximated this amount to 75 milliliters. The Prophet also used to shower using an amount of water equivalent in our time to approximately 1.5 Liters as demonstrated in the below ahadith. One may first understand this to be an outcome of the desert environment in which the Prophet resided and that if he was in an environment with an

abundance of water, he would not have lived or taught the believers these vital conservation principles.

However, the last hadith below, brings to light the fact that abundance of water (or by analogy any resource), does not nullify the prohibition of wastefulness. This principle is extremely needed in our times, where those who have, in many instances, abused the resources thereby depriving those who do not have from ever having.

Anas, reported: The Prophet, peace be upon him used to make wudu with a mudd (of water) and make ghusl with a saa' or up to five mudds (Muslim).

Prophet Muhammad, peace be upon him, said to Sa'ad (a companion) when he passed by him while he was busy doing wudu, "What is this wastage, O Sa'ad?" In which he replied, "Is there wastage in wudu?" The Prophet (peace be upon him) answered, "Yes, even if you were at a flowing river." [Ibn Maja]

Personal Hygiene

One of the main causes of disease today is inadequate sanitation and personal hygiene. The improper disposal of human waste has proven to be one of the most threatening problems of our time. There are numerous ahadith of the Prophet Muhammad teaching the Muslim to maintain adequate personal cleanliness as an act of worship to Allah. The following are some of these ahadith describing the way the prophet Muhammad used to cleanse himself after relieving himself. These ahadith describe using water as a means for washing as water is considered the tool of purification. The ahadith state that washing is performed after either defecating or urinating. Further, the ahadith teach that one should wash one's hands after waking up from sleep and before touching any utensil. This is because of the uncertainty of what the hand had come in contact with at the time of sleeping, as it could have carried some impurities through touching the private parts. If such precautions are taken when there is a concern of possible contamination than this clearly shows Islam's perspective on obvious or anthropogenic contamination.



Anas b. Malik reported: The Messenger of Allaah (peace be upon him) entered an enclosure while a servant was following him with a jar of water and he was the youngest amongst us and he placed it by the side of a lote-tree. When the Messenger of Allaah, ((peace be upon him) relieved himself, he came out and had cleansed himself with water. (reported by Muslim #642)

Anas b. Malik reported: When the Messenger of Allaah (peace be upon him) entered the privy, a servant and I used to carry a skin of water, and a pointed staff, and he would cleanse himself with water. (reported by Muslim #643)

Abu Huraira said: The Prophet of Allaah (peace be upon him) said: When anyone amongst you wakes up from sleep, he must not put his hand in the utensil till he has washed it three times, for he does not know where his hand was during the night. (reported by Muslim #665)

Solid Waste

The issue of solid waste handling was also addressed by the Prophet Muhammad and those who emulated him. **The Prophet encouraged Muslims to maintain the cleanliness of the roads through explaining that removing obstacles or hazards from the path is a branch of faith.** This is a very significant teaching as matters of faith form the backbone of Islam. Solid and hazardous waste can be causes of various forms of harm, starting from a visual nuisance to the spread of lethal disease. The idea was to remove the waste or the obstacle from the street or in general area where people will come into contact with the obstacle and keep it as far away as possible from where it could cause harm to people. The principle was to remove it from the zone in which it could cause effects on the health of the public.

This concept is applied today in the form of disposal and treatment techniques, which aim to remove the waste and treat it as well since moving it alone still presents a hazard to human health. Today these teachings may be interpreted as the importance of proper solid and liquid waste collection, treatment and disposal through methods such as landfilling, ocean outfalls, or deep

well injections. This is also applicable on the individual level by stressing that it is a lack of faith that a person carelessly disposes of waste in the street as happens very often within Muslim populations which have not internalized these teachings. The following ahadith present the principles discussed.

Abu Huraira reported that the Prophet said: "Faith is some seventy branches, the highest of which is "There is no god but God, and the least is removing obstacles from the path of people, and that shyness is a branch of faith." (Muslim)

Abu Huraira reported that the Prophet said "Be ware of the two [acts that bring] curses: relieving oneself in the path of people, or in the shade [i.e. where they usually rest. (Muslim)

When Abu Musa was sent to Al-Basrah as the new governor, he addressed the people saying:

" I was sent to you by 'Umar Ibn Al-Khattab in order to teach you the Book of your Lord [i.e. the Qur'an], the Sunnah [of your prophet], and to clean your streets." (Sunan Aldarami)

Methods of prevention

In the following ahadith, it becomes apparent the guidelines that Islam puts on the behaviors of individuals to avoid any negative effect on the health of the public before it occurs, rather than curing it when it happens i.e. prevention. The Prophetic guidance that was received through these excerpts of narrations create a quarantine on any disease outbreak by keeping the diseased town in a controlled system that nothing can enter in or exit from. It also, preserves the public health by prohibiting relieving one's self in a place where other individuals may be affected (e.g. roads and places of sitting). The prohibition of urinating in any stagnant water preserves the health of the public through the prevention of pathogens (disease causing microbes) from human waste. Add to that, the cleaning techniques, taught by the prophet, of a utensil which a dog had licked to ensure cleanliness.

'Amir b. Sa'd reported that a person asked Sa'd b. Abu Waqqas about the plague, whereupon Usama b. Zaid said: I would inform you about it. The Messenger of Allah (peace be upon him) said: It is a calamity or a disease which Allah sent to a group of

Bani Isra'il, or to the people who were before you; so when you hear of it in land, don't enter it and when it has broken out in your land, don't run away from it.

(reported by Bukhari 3286 and Muslim 5903)

Aisha (the wife of the Prophet) said: I asked Allah's Apostle about the plague. He told me that it was a Punishment sent by Allah on whom he wished, and Allah made it a source of mercy for the believers, for if one in the time of an epidemic plague stays in his country patiently hoping for Allah's Reward and believing that nothing will befall him except what Allah has written for him, he will get the reward of a martyr."

(reported by Bukhari 5402)

Abu Huraira reported: The Messenger of Allah (peace be upon him) said: Be on your guard against two things which provoke cursing. They (the companions present there) said: Messenger of Allah, what are those things which provoke cursing? He said: Easing on the thoroughfares or under the shades (where they take shelter and rest). (reported by Muslim #641)

Jabir reported: The Messenger of Allah (peace be upon him) forbade to urinate in stagnant water. (reported by Muslim #681)

Abu Huraira reported: The Messenger of Allah (peace be upon him) said: The purification of the utensil belonging to any one of you, after it is licked by a dog, lies in washing it seven times, using sand for the first time. (reported by Muslim #677)

that he (the Prophet) then gave orders to one of the people who brought a bucket of water and poured It over.

(reported by Muslim #687).

Anas b. Malik reported: While we were in the mosque with Allah's Messenger (peace be upon him), a desert Arab came and stood up and began to urinate in the mosque. The Companions of Allah's Messenger (peace be upon him) said: Stop, stop, but the Messenger of Allah (peace be upon him) said: Don't interrupt him; leave him alone. They left him alone, and when he finished urinating, Allah's Messenger (peace be upon him) called him and said to him: These mosques are not the places meant for urine and filth, but are only for the remembrance of Allah, prayer and the recitation of the Qur'an, or Allah's Messenger said something like that. He (the narrator) said

Objectives of Islamic Law

In order to guide Muslims to take on a positive environmental-health ethic, the Law that Muslims abide by needs to be understood and then properly communicated to Muslims. As previously discussed it is critical to understand first, the general Islamic maxims defining the overall relationship between a Muslim and his/her environment and second, the specific Islamic legal rulings dealing with specific environmental-health issues taken directly from the Quran, Prophetic traditions, or authentically accepted scholarly rulings based on the Quran and Prophetic traditions. However it is also important for the Muslim (both the lay Muslim and the scholar) to always keep in mind the objectives of Islamic Law.

The Prophet Muhammad (pbuh) did not speak in specific terms about every possible situation a Muslim would encounter between him or herself and the environment. However, he left Muslims with an understanding of the objectives of Islamic law so scholars can deduce “new” law based on the changing circumstances. Such an understanding would also help a lay Muslim in making decisions on certain situations

that arise when access to a scholar in a timely manner is not practical. This fact, that laws are based on objectives and rational and therefore vary with the varying of that rational, is the accepted understanding for the vast majority of Islamic Law (*Mokhtar Maghraoui*). This body of law includes much of the Muslim’s interaction with his/her environment.

To understand the objectives of Islamic law, the objective of the creation of man must first be stated. The purpose of the creation of the human being is mentioned very clearly in the Quran where Allah says “ *I have only created Jinns and men, that they may worship Me*” (Q: 51:56). Worship means the complete submission of ones will to the Will of Allah. Therefore to fulfill this purpose of worship the objective of the human must be the same as the objective of the Creator. The purpose of Islamic law (Shariah) is essential for the fulfilling of this purpose of life since it is the means by which humans know the objective of the Creator/Law-Giver.

The objective of the Law-Giver’s law (Shariah) has been simply stated by the well

known Islamic scholar, Ibn Al-Qayyim as “The fulfillment of the interests of people in their worldly life and their afterlife” (*Mokhtar Maghraoui*). Another great Islamic scholar, Al-Izz ibn Abd al-Salam, sums up the purpose of Islamic law as “Securing benefits and warding off detriments” (Abd-Allah, 2007). This is a critical concept to understand since legal rulings that bring detriment and deter benefit cannot, by definition, be Islamic Law. As mentioned by Dr. Farook Abdullah “Islam must make sense, but, to make sense, it requires intelligent followers with Sound understanding” (Abd-Allah, 2007). “In Islamic Law there is nothing that is impermissible except that its harms outweigh its benefits. Similarly, there is nothing that is obligatory except that its benefits outweigh its harms” Dr. Mokhtar Maghraoui (*Mokhtar Maghraoui*,). Therefore the objectives of Islamic Law are intended to maximize the benefit for the human being. It is clearly understood in Islam that Allah is not in need of the humans worship but any good that an individual does is for his/her own sake. “*If you did well, you did well for yourselves; if you did evil, (you did it) against yourselves (Q:17:7). O people! It is you that have need of Allah, but Allah is*

the One Free of all wants, worthy of all praise (Q: 35:15).

This benefit that individuals strive for have been summarized by Islamic scholars as the “5 major objectives of Islamic Law”. These major objectives are the preservation of *Religion, self, intellect, progeny, and wealth* listed in order of priority (*Mokhtar Maghraoui, Abd-Allah, 2007*). If any law violates the preservations of the above 5 objectives it has violated Islamic Law and therefore cannot be Islamic Law. The preservation of the five major objectives are done at three different priority levels which are the: *Necessities, needs, and compliments* (*Mokhtar Maghraoui, Abd-Allah, 2007*). Necessities include everything that without which would make the preservation of any of the 5 major objectives impossible, while the Needs include everything that without which would make any of the 5 major objectives difficult, while the compliments include everything that beautifies the 5 major objectives. A possible simple example for the major objective of preserving the self includes access to oxygen (a necessity) and taking a shower daily (a compliment), and needs would fall in between. Time and resources must be applied to higher levels of preservation first

and never should a lower level be given precedence over a higher level.

With this understanding of Islamic Law, the criticalness of appropriately interacting with the environment becomes evident. To achieve the 5 major objectives of Islamic Law at all three levels of priority of preservation one must have a healthy environmental health ethic. **Taking the major objectives of protecting the self, intellect and progeny as an example; this cannot be accomplished if the environment is laden with infectious disease from improper disposal of solid and liquid wastes, or by using limited water in a wasteful manner, or by not maintaining a clean personal hygiene.** Therefore all these factors leading to a true environmental-health ethic are encompassed in the very objectives of Islamic Law and therefore whether specific rulings are issued regarding them or not, this fact is sufficient to cause Muslims to broadly accept appropriate environmental-health ethics. In addition, Dr. Mustafa Abu-Sway mentions that protection of the environment is itself a

major aim of Islamic law (Abu-Sway, 1998). He mentions that this is already obvious in the 5 major objectives since, since if the environment continues to deteriorate there will be no life, property of religion (Abu-Sway, 1998). “Excess pollution might lead to sterility, deformities, abortion and chronic diseases” Abu-Sway (Abu-Sway, 1998).

The fact that specific religious rulings pertaining to environmental health are not apparent to all Muslims is due to a number of factors including first from the scholars end: the unawareness of some of the pressing environmental health problems and a lack of understanding or willingness to assess current issues in the light of the objectives of Islamic law, and from the lay Muslims end: the attempts to secularize Muslim communities by limiting Islam to ritual practices and the lack of internalization of Muslims of the spirit of their religion and its importance in their life (and both reasons lead to individuals ignoring any Islamic laws that are issued by the scholars who are addressing the problem).

Islamic Spirituality

Islamic Spirituality and its relationship to Environmental Health Ethics (EHE)

“The essence of the environmental crisis is a spiritual crisis” Saad Hussein Naser. This is the conclusion one will come to after contemplation about the EHE problems of today. This is not to say that there are not other contributing factors such as lack of education and poverty; but that the spiritual crisis is one of the most significant contributing factors to the poor environmental health conditions of today. The purpose of the creation of the human being is to worship, know, and love Allah, the Creator. This is the spiritual and therefore most lofty goal that Muslims are to strive for. Allah is the Creator and Infinite Source of peace, happiness and freedom, and therefore orienting one’s self to Allah will allow one to achieve this true happiness that everyone truly desires, knowingly or unknowingly. The more one strives to worship Allah and draw nearer to Him the more one finds this happiness and tranquility in their heart in this life and of course the bliss of the next life while the opposite results in turbulence and lack of satisfaction in this life and torment in the next. This is what is meant by the goal of Islamic

spirituality. The more the individual internalizes this purpose and orients him/herself towards this lofty desire and goal, the more one will be less oriented towards the much lower human desires such as possessing material wealth and social status. These lower human desires if not controlled lead to many vices such as greed, arrogance, envy, disorderliness, impatience and even hate. This in reality is the root cause of many of our environmental health problems. Individuals who are oriented to the lofty goal mentioned and not these superficial and temporary goals will have the urge to plant a tree, clean the street, conserve water, and eat only their fill, out of humility, gratitude, generosity and seeking the reward from their Creator and without the desire for any recognition from other people. Allah speaking about such people in their interaction with others says: *“And they feed, for the love of Allah, the indigent, the orphan, and the captive, (Saying), “We feed you for the sake of Allah alone: no reward do we desire from you, nor thanks””* (Q: 76:8-9). The presence of such people in a community is like the presence of the sun benefiting anyone and anything it comes

into contact with.



With the overwhelming presence of vices that urge an individual to act in a way that is damaging towards the rest of the environment (including other individuals), the concepts that were previously mentioned in this guidebook about the reality of the environment and the Muslim's relationship with and within it, cannot be internalized. These vices form a sort of veil on one's heart not allowing these teachings to be internalized since such a heart is pre-occupied by achieving more material and social gains. Such a person finds it hard to see the beauty, peace and happiness involved in gently interacting with the environment because such is not his/her orientation. Therefore not only are these vices and lack of orientation towards Allah the core source of the lack of environmental health ethics, their presence also makes it very difficult for all of what has been presented in this guidebook to be

internalized and then actualized. The reality is that most Muslims have at least some idea of the fact that their religion teaches environmental ethical concepts such as cleanliness and conservation. However this knowledge is actualized amongst a much smaller percentage of Muslims for the reasons mentioned above.

What is needed is for Environmental-Health consciousness and ethics to become an established character trait of the Muslim attached to the very essence of one identifying oneself as "a Muslim" (one who submits to Allah) as opposed to simply being instructions on a paper or heard from a preacher. This, it is believed, would result in a genuine, consistent and comprehensive EHE in Muslims.

The authentic and traditional Islamic spiritual tradition presents a unique opportunity to establish environmental health ethics as a character trait of the Muslim individual by allowing the knowledge of EHE to be internalized and not simply known at the intellectual level. The goal of Islamic spirituality is to free the Muslim from vices of the heart and firmly embed virtues that will ultimately allow one to be nearer to one's Creator and truly

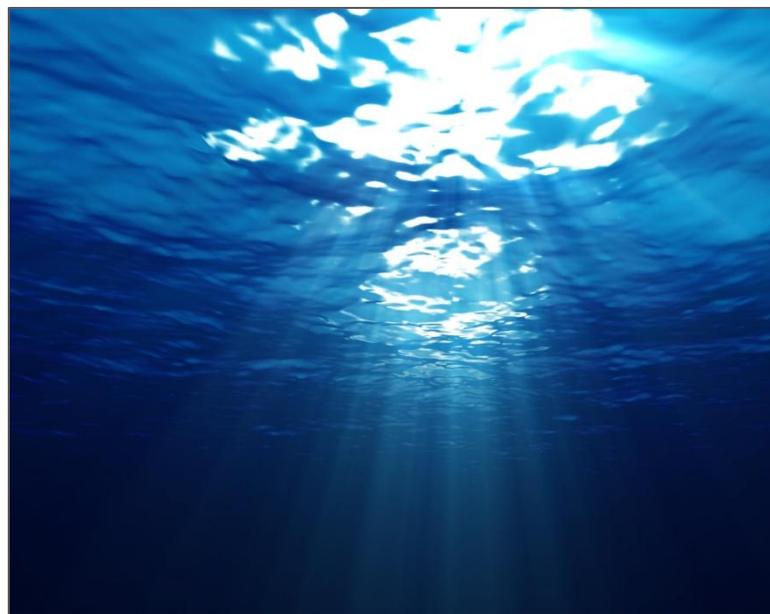
establish one's purpose in life as previously mentioned. These character traits or *Akhlaq* are the internal image of the Muslim. This internal image is sometimes also termed the heart or the soul. This is a critical matter in Islam since this is how God assess the believers and hence establishes one's relationship with God in this life and the next. The Prophet Muhammad (peace and blessings of Allah be upon him) teaches that "Verily Allah does not look to your bodies nor to your faces but He looks to your hearts" (Sahih Muslim: 32:6220). Allah also says in the Quran: "*But only he (will prosper) that brings to Allah a sound heart (Q. 26:89)*". In other words the focus is on ones internal image, ones heart, if this is pure all else will follow, as the Prophet (peace and blessings of Allah be upon him) has explained "Truly, in the body there is a morsel of flesh, and when it is corrupt the body is corrupt, and when it is sound the body is sound; Truly, it is the heart (Sahih al Bukhari).

The vices of the heart include traits such as arrogance, conceitedness, delusion, selfishness, stinginess, rancor, envy, impatience and ungratefulness. Such vices are essentially the underlying reason for the lack of environmental-health ethics as previously mentioned. Removal of these

vices and replacing them with virtues such as humility, generosity, and sincerity is the essence of Islamic spirituality. This process of removing these vices is known as *Tazkiya tul nafs* or Purification of the Self. Allah, speaking of the self says, "*Truly he succeeds the one who purifies it*" (Q: 91:9). This process is the way for the individual to achieve their purpose in existence: freedom/happiness in this life and the next through their relationship with Allah. This is also the same path to achieve a sustainable effective and comprehensive positive Environmental Health Ethic.

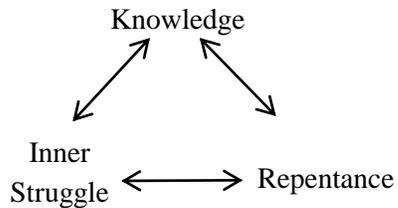
Therefore the approach for the actual implementation of the concepts in this guidebook is to first open the "ears of the heart" of the Muslim as well as remove vices working contradictory to EHE, through Islamic Spirituality, then introduce specific Islamic teachings relating to environmental health practices and then finally a general awareness of the EHE issue(s) i.e. from a scientific perspective, as demonstrated in the below equation. Islamic teachings and EHE issues are both discussed in this guidebook, while the process of *Tazkiya tul nafs* is discussed below. The combination of all three factors is what should lead to the positive EHE in Muslims.

[EHE issues (i.e. as understood scientifically) + Islamic teachings related to EHE issues] →through Islamic Spirituality (internalizing the Islamic teachings) = Positive EHE



Purification of the Self

One simple way to understand this process of Purification of the Self is through the *Tazkiya* cycle or Purification cycle as illustrated here (Maghraoui, 2007).



The Purification cycle is composed of three steps: knowledge, repentance, and inner struggle which are in a cyclic format because a Muslim is to continually “move” internally from one step to the other in the cycle. These are the practical steps to achieving the goal of Islamic spirituality. To re-iterate the intent of the Purification cycle is to purify the Muslim from all the internal vices and to replace them with virtues therefore allowing one to properly orient oneself to Allah, Knowing His unique Oneness in every aspect and living a life of servitude to Him (“Islam”). Therefore, one cannot, by definition, as explained throughout the guidebook live in a state of abuse, misuse, and harm to one’s environment.

The first step in the Purification cycle is knowledge and this refers to a Muslim’s requirement of acquisition of knowledge. The Prophet Muhammad (peace and blessings of Allah be upon him) instructs believers that “Seeking knowledge is an obligation on every Muslim (Hadith Hassan). It is well known in the Islamic discourse that Allah is not worshipped by ignorance. One must first know what Allah commands of one to be able to properly worship Him and hence achieve the purpose he/she was created for. The knowledge referred to here is at least the minimal knowledge one must know in order to live a proper life (as determined by the Creator first and foremost) in both the spiritual and worldly sense, for in reality both are interconnected. Allah stressing the importance of seeking knowledge says: “...*Those truly fear Allah, among His Servants, who have knowledge: for Allah is Exalted in Might, Oft-Forgiving*” (Q: 35:28). It is people that have truly acquired knowledge that will truly worship and know God as well as appreciate the blessings given to them by God from the fact that He allowed them to exist to all the other blessings he has bestowed them with. More specifically, this knowledge should include also information on Allah’s names and

attributes such as being the Creator, Sustainer, Judge, Most Merciful and my ultimate desire as a Muslim. It should also include knowledge of the vices that exist within me such as selfishness, impatience, lack of sincerity with God and with His creation, etc. The information presented in this guidebook (i.e. understanding how a Muslim is expected to interact with his/her environment through both Allah's words in the Quran and example given to Muslims by Prophet Muhammad (peace and blessings of Allah be upon him)) would also be encompassed within this first step of gaining knowledge.

Once I have begun sincerely on this path of seeking knowledge, and we use the word *begun*, for this is a life-long pursuit, one should be led naturally and by Allah's grace to repentance. Once one realizes the greatness and perfection of Allah and the imperfection, vices, and deficiencies that one carries and acts upon, one realizes that there is no other recourse but to ask His pardon. The word for repentance in Islamic discourse is "*Tawba*". *Tawba* not only carries the meaning of seeking Allah's forgiveness but linguistically means returning to Allah. For as long as one is in disobedience of Allah, whether through missing prayers or through damaging the

environment one is in a state of further distancing from Allah. With the knowledge gained one realizes this matter, stops, and turns back "towards" Allah. This is a natural consequence of a genuine seeker of knowledge. Allah says: "*O you who believe! Turn to Allah with sincere repentance: In the hope that your Lord will remove from you your ills and admit you to Gardens beneath which Rivers flow...*" (Q. 66:8). Repentance entails three integral components: regretting the negative action or sin, immediately discontinuing doing this action, and resolving not to return to this action. Also my sin involves someone else's right I should return that person's right. Missing anyone of these integrals would not result in a true and sincere repentance for reasons that are obvious upon some reflection. However, truly applying all three components and then slipping again into the negative action, does not nullify that repentance but calls for another one. Again repentance is part of the cycle, meaning that along the path the more I learn the more I will have to repent or re-orient myself towards Allah. Allah praises those who are constantly seeking his forgiveness and returning to Him as everyone by design cannot fulfill Allah's right upon them or recognize His greatness at the level

deserving of His majesty; “*No just estimate have they made of Allah, such as is due to Him*” (Q:39:67). This too, like knowledge, is a lifelong process, as the soul becomes more pure, purifying oneself from even more hidden and subtle defects. Therefore any action which Allah does not love including any unfitting interaction with Allah’s environment is a reason for repentance. In the environmental health context, using one category such as food wastage one may start the path repenting from such actions as wasting gallons of milk monthly from over-purchasing while later on in the path one may find a need to repent from wasting a single grain of rice without a just reason.

As a natural consequence of Tawba and by Allah’s grace one is now in the internal “battle field” against one’s lower self (Maghraoui, 2007). Through the Tawba or repentance one has resolved to not return to the negative action or sin one was committing. This is usually in contrary to one’s internal drive, as one’s soul is still in the process of purification and therefore has drives other than the lofty ultimate drive of

seeking Allah’s nearness and pleasure. Therefore, the result is a continuous internal struggle or “*mujahadda*” (derived from the same root word as the word *jihad* or struggle) that one takes part in struggling against one’s drive for what one knows is right through the step of knowledge and committed to, through the step of repentance. For example, in the environmental health context, this means going against the urge to throw my trash out of the window of my car in order to get rid of it as soon as possible and instead holding it and making the extra effort to transport it to a proper disposal container. Another example could be going against the urge to leave my water faucet on while I am busy doing something else and instead making the extra effort to turn it off and on as needed. This internal struggle takes place for everyone at different levels and for different issues until for some issues it does not become a struggle anymore but a natural character trait of the Muslim.



This is the intended result i.e. that ultimately being environmental-health ethical is who I am as a matter of being. Again, this internal struggle, as are the previous steps, is a life-long process. In addition, as the cycle

repeats, I continue to gain more knowledge of my areas of deficiencies, repent from them, and then struggle to rid myself from them. This constant process coupled with the knowledge of the present day environmental health problems and the Islamic teachings on how to deal with them should result, by Allah's grace in a person whose presence brings only benefit to those around him: from animals, to plants, to other human beings and even to inanimate creation.

Environmental and Environmental-Health Problems in the Muslim World

Introduction

In order to apply the Islamic Environmental-Health ethics to present day environmental-health challenges one's needs to familiarize one's self with the region specific environmental health effects of predominantly Muslim countries. To formulate successful methods of exonerating these effects, one must also understand the *root* of the region-specific problems.

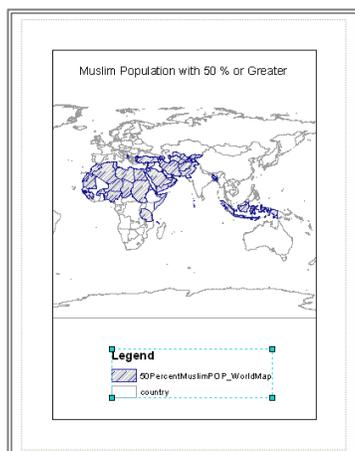
Although census records are lacking in many of the countries in focus, we gain insight into the environmental health situation by observing the progress of health reports by international organizations.

The relationship between the environmental health situation of a nation and its management of resources and infrastructure is magnified with the health reports' statistics. Management of resources and infrastructure has been a challenge for societies since they have existed. Throughout history, a healthy civilization has been one that encompasses successful management of: waste, water, energy, and food. A large portion of these four sectors is

inherently environmental. An estimated 24% of the global disease burden and 23% of all deaths can be attributed to environmental factors. Perhaps that is why the slogan chosen for Arab Environment Day by the WHO regional office and League of Arab States was, "our health depends on a safe environment." The majority of regions with a predominantly Muslim population are considered "developing." The total number of healthy life years lost per capita as a result of environmental burden per capita was 15-times higher in developing countries than in developed countries. The environmental burden per capita of diarrheal diseases and lower respiratory infections was 120- to 150-times greater in certain WHO developing country sub regions as compared to developed country sub regions. These differences arise from variations in exposure to environmental risks and in access to health care.ⁱ

The focus of this section is an investigation of the environmental health issues pertaining to countries with a 50 percent or greater Muslim population. All fifty-two countries with 50 percent or higher Muslim population were identified by a Census projectionⁱⁱ. The

literature review for the environmental issues associated with its particular country



was then recordedⁱⁱⁱ along with the citation. Based on the similarities between countries over a particular region, the countries were grouped into regions identified below. These regions are consistent with the region divisions identified by the World Health Organization and the United Nations Environmental Outlook^{iv}.

Three of the highest priority environmental health concerns in 50% or greater Muslim populated countries are: water, waste and hygiene, and air and soil pollution. We can combine together the concerns per region, because each region has main priority concerns. The per region diversity is not only based on geography, but also what the major economic trends of that particular area are: such as whether it is agriculturally active, in which case soil pollution and

runoff into water is a major concern, or whether it produces oil for energy in which case, industrial waste leads to contaminated water and air pollution.

Although it seems that there are various concerns to be addressed, they are heavily related, and in fact, as we explore the effects these problems have on each other, the issues become one. For example, as the demand for water goes unchallenged, so does the production of wastewater and pollution. Significant proportions of the scarce water resources continue to be consumed by pollution from *inadequate sanitation, insufficient and inefficient management of wastewater and weak environmental protection policies*. Pollution itself is a major water consumer.

Region Overview

The following groups are based on a combination of natural resources of the area, climate, and socioeconomic similarities of the countries:

The *Sub Saharan Africa* region includes Chad, Eritrea, Gambia, Mauritania, and Nigeria. Forty seven percent of deaths are a result of environmental stressors in this region. There is an ecological break between

the desert climate of the Sahara and the Horn of Africa, the semi-arid Sahel and the tropical climate of Central and Western Africa which displays the array of geographic variance. Southern Africa has a transition to semi-tropical or temperate climates, and more desert or semi-arid regions, centered on Namibia and Botswana.

The *South Asia* region includes: Pakistan, Sri Lanka, Bangladesh, and Indonesia and Malaysia. South Asia is surrounded by (from west to east) Western Asia, Central Asia, Eastern Asia, and Southeast Asia. The existence of the highest mountains and largest mangrove forests in the world, lush jungles, the tenth-largest desert on Earth, deep river valleys and many other landscape features, decorate the countries of South Asia, providing a variety of geographic features.^v

The *Central Asia* region includes: Iran, Republic of Kazakhstan, Kyrgyz Republic, Republic of Tajikistan, Turkmenistan, and Republic of Uzbekistan, Azerbaijan, and Afghanistan. This region is characterized by mountains, deserts, and steppes. The arid and rugged topography does not support agriculture.

The *Eastern Mediterranean* region encompasses North Africa and West Asia, thereby including: Iraq, the Syrian Arab Republic, Jordan, Lebanon, West Bank and Gaza, Egypt, Morocco, Libya, and Algeria. In 2002, 26% of the deaths in the region were a result of the environment^{vi}. The region is arid and semi arid and thus poorly endowed with fresh water. The Region has 1% of the world's freshwater supplies and 5% of the world's population.

We have added a Gulf Council subsection that includes: Bahrain, Kuwait, Oman, Qatar, the United Arab Emirates, and Yemen. Although these countries fall within the Eastern Mediterranean Region, they have a number of additional concerns, and they share several distinctions with the other countries of this region. They are more industrially focused than they are agriculturally. And the majority of their water sources are underground, for example. This Region is also characterized by a harsh desert environment devoid of rivers and lakes.

Environmental Health Stressors

When observing the environmental concerns of the regions, the following associations^{vii} with the health of the population become

apparent. These are to illustrate the integral part the environment has on health, and to familiarize ourselves with major environmental health concerns of the countries in these regions. Only environmental stressors and diseases relevant to the above regions have been included.

Drinking water pollution is due to waste (i.e. agricultural, industrial, sewage) and it leads to exposure to a range of infectious diseases (i.e. rotavirus, amoeba *histolytica*, and carcinogenic substances in the water, *Ascariasis*, *trichuriasis*, hookworm disease, trachoma, *schistosomiasis* and Chagas disease, as well as exposures to chemicals (i.e. arsenic)). Poor water and sanitation also play an important role in malnutrition and diseases related to malnutrition such as diarrhea, and diseases caused by intestinal parasites. The resulting waterborne diseases could be prevented through improved hygiene, water and sanitation.

Air pollution, another major concern of these regions, results from burning of waste and industrial/motor emissions and it leads to poor respiratory health and cardiovascular health, as well as potential exposure to chemicals such as lead. Many of these

conditions have a link to exposure to air pollution through the environment and/or occupation.^{viii}

Tobacco use is another crisis in these regions, and it has only been climbing steadily. Many, or even most, children are regularly exposed to environmental tobacco smoke. In many of these countries, children constitute very high percentage of the population.^{ix} Chronic obstructive pulmonary disease (COPD) is a slowly progressing disease characterized by a gradual loss of lung function. In terms of total disease burden, the most important risk factor is active smoking, estimated to contribute to 36% of the global disease burden of COPD (WHO, 2002). Occupational exposures to airborne particulates, for example, were responsible for 12% of the global COPD disease burden^x, and exposures to indoor smoke from solid fuels accounted for a further 22%^{xi}.

Land degradation and soil pollution, as well as climate change, can also contribute to malnutrition to a certain extent. It was estimated that climate change accounted for 2% of the health burden of malnutrition (WHO, 2002). Overall, 50% (39—61%) of

Soil pollution the health burden of

malnutrition was estimated to be attributable to the environment, and in particular to poor water, sanitation and hygiene. Malnutrition causes vulnerability and increases the risk of adverse health outcomes, particularly in children.^{xii} Soil pollution occurs when harmful substances from waste water and irrigation are poorly disposed of and treated. Land degradation also contributes to the increasing amounts of soil pollution, especially with rising populations.

Body and food hygiene is a major health concern for the regions. In areas with water scarcity, it is a struggle to maintain cleanliness. However, this is an integral part of improving the environmental health situation. According to the WHO^{xiii}, improving access to safe water sources and better hygiene practices can reduce trachoma morbidity by 27%. Hygiene interventions including hygiene education and promotion of hand washing can lead to a reduction of diarrheal cases by up to 45%. Current understanding of *Schistosoma* indicates that the disease burden is fully attributable to risk factors associated with water, sanitation and hygiene (Prüss-Üstün et al., 2004a).

In these countries traditional foods constitute a major part of everyday meals.

These foods are generally simple in preparation. However, traditional foods are characterized by being intensively handled by workers, often in premises that do not adhere to hygiene standards and lack control measures that may help reduce and/or eliminate microbial hazards prior to consumption, says the Center for Environmental Health Activities about its HACCP model handbook which was intended to serve as a model for food hygiene and food safety in the area. The handbook includes details on the specific methods used for preparing traditional foods consumed by the public in this region. Several factors impact the food safety, such as the bacteria that is in the ingredients, the method of preparation, and the storage. For example often times food is exposed in the cities for a long time, thus the temperature and vectors for pathogens impact its quality.

Fisheries are also highly associated with environmental stressors in these countries. Fisheries are one of the most important resources in the Eastern Mediterranean region, for example, particularly in the UAE and Oman, with annual fish production in the region of 298,000 tons in 1994 (LAS, 1995c). There has been a sharp decline in fish harvests in some countries over the past

few years due to overexploitation and inadequate fisheries management, land reclamation and coastal dredging, excessive trawling, and increased marine pollution from waste discharge and oil pollution (UNEP, 1990; ROPME/ IMO, 1996).

Sustainable Change

Another critical issue is the sustainability of improvement. With the importance of environmentally securing health in these countries, we must address that, “Development achieved without people as its instigators and stakeholders is neither sustainable nor meaningful,” as the 2010 WHO report said. Without sustainability, the progress of securing health would not be sustainable either. In the UN’s millennium report for example, an emphasis is made on providing more piped groundwater access to people around the world. However, ground water is a problem in allowing the surface water to be polluted.

Lack of sustainability coupled with a lack of efficiency, such as while irrigating crops, increases the environmental stressors, which gives us insight on the areas where improved water has decreased in the course of the decade. Water is often used wastefully, unwisely and inefficiently in agriculture, as well as by municipal,

industrial and commercial users. Losses in public water supplies reach as high as 60%, exceeding the quantity reaching the consumers. And secondly, once water reaches its intended target, it is not used efficiently as *consumers have no incentive to conserve*. Inefficient water fixtures are widely used; public buildings in particular are water wasters. In agriculture, as little as 50% of the water supplied is actually used for food production and even then with low farming efficiency. Supply-driven water resource policies have exacerbated the water shortages in these regions. So there are three main issues facing water: the scarcity, the inefficient transport, and the excess use. Some countries are mining their non-renewable fossil groundwater as a solution. However, excessive exploitation of non-renewable water is not sustainable. This can also be said about soil and air quality.

As we explored above, the priorities shared by all regions are water, waste and hygiene. But as water and waste heavily impact the air and soil, the air and soil quality of severely impacted regions is included as well.

Regional Analysis

The following is a region- based analysis of the environmental stressors addressed above.

Sub-Saharan Africa

Twenty-eight percent of the global population without access to improved water supplies lives in Africa. About 3 million people across this region die annually as a result of water- related diseases^{xiv}. In 1998, 72 per cent of all reported cholera cases in the world were in Africa. As of 2002 in sub-Saharan Africa, 42% of the population was still without improved water (WHO facts and figures). In 1990 the WHO estimated 51% of Sub-Saharan Africa used unimproved drinking water sources and as of 2006 41% were still estimated with unimproved drinking water. This shows only a one percent decrease in 4 years. Another common issue in this region is that the minor increases in water improvement are not keeping up with the population growth of the countries.

Sanitation coverage was only 26 % in 1990, and in 2002, in sub-Saharan Africa sanitation coverage was a mere 36%. *Schistosomiasis* causes tens of thousands of deaths every year in this region. It is strongly related to unsanitary excreta

disposal and absence of nearby sources of safe water. Basic sanitation reduces the incidence of this disease by up to 77%. As of 2008, for example, 49 million people still defecated in the open in Ethiopia, 33 million in Nigeria, and 12 million in Niger, estimated the WHO. As of 2006 those without sanitation decreased to 31%, and on average, less than 30% had access to improved sanitation, said the 2006 World Health Report. In 2008, 565 million people in Sub Saharan Africa remained without improved^{xv} sanitation

As for the soil in this region, better quality agricultural land is taken over for commodity and cash crop production. The environment suffers as a result as soils are mined and the use of fertilizers and pesticides becomes more extensive.^{xvi} Soil erosion is also causing increased siltation of rivers and dams. In the Sudan, for example, the total capacity of the Roseieres reservoir, which generates about 80 per cent of the country's electricity, has fallen by 40 per cent in the past 30 years as a result of silting from the Blue Nile.^{xvii}

South Asia

In 1990, only 25% of the population in this region was recorded to have improved

sanitation, and in 2008 it only increased to 36% according to the Water and Sanitation Report by the World Health Organization. Also as of 2008, 48 million people still defecated in the open in Pakistan, 15 million in Nepal, and 58 million in Indonesia

In 1990, 25% of the population used unimproved drinking water sources in comparison with 13% in 2008. Despite the 12% decrease of unimproved water sources, as of 2008, 222 million people in Southern Asia remained with unimproved sources of drinking water, stated the Water and Sanitation Report of WHO. As of 2002, in Bangladesh for example, between 28 and 35 million people consume drinking-water with elevated levels of arsenic in their drinking-water. The WHO found an association with cancer and other health effects with arsenic exposure through drinking water. The number of cases of skin lesions related to drinking water in Bangladesh is estimated at 1.5 million.

The groundwater levels have been sinking at alarming levels in some parts of these countries. Apart from irrigation water use, new freshwater resource demands are emerging from other sectors (e.g., hydropower; recreation; navigation). Water demands are rapidly increasing, due largely

to rapidly changing lifestyle associated with increased socioeconomic development. In fact, rapid urbanization has become a key issue that will likely to seriously impact water demands and water quality.^{xviii}

Decreasing soil quality is also impacting this region's economy, an estimated 10 billion dollars/year in losses in a 1994 study.^{xix} The study^{xx} defined land degradation as "the temporary or permanent lowering of the productive capacity of land." Soil fertility decline, due to lowering of soil organic matter and loss of nutrients, is substantial and widespread in the region.

This is due primarily to the increased and incorrect use of fertilizers. Water logging or the lowering in land productivity through the rise in groundwater close to or above the soil surface is caused by incorrect irrigation management. Salinization, another cause of soil degradation caused by increase of salt in the soil, is caused by incorrect irrigation management or intrusion of sea water into coastal soils arising from over-abstraction of groundwater. It is severe on irrigated lands of the dry zone. It reduces crop yield and in severe cases causes complete abandonment of agriculture, lowering of the groundwater by Bangladesh (75%), Pakistan (61%), Sri

Lanka (44%), Nepal (26%), and Bhutan (10%).

As for the air quality in this region, of the 15 cities in the world with the highest levels of particulates, tiny specks of soot, dust and other solid pollutants linked with breathing problems and heart attacks, 12 are located in this region. Six of these cities also have the highest levels of atmospheric sulfur dioxide (SO₂).^{xxi}

Central Asia

One of the problems faced by the Central Asian region is the hazard of growing anthropogenic pressure on the natural environment. In particular, for example, is the growing pollution of the air basin. The real example is the Aral disaster that has demonstrated to what *irrational natural resources management* may lead to.

There were dust storms that blew up from the dried sea bed millions of tons of hazardous *solonchak* dust that spreads to great distances and accumulates on the underlying surface of the Earth. This is predominantly due to waste.

Not only is the waste impacting the air, but also the water of this area. Municipal sewage containing more than 40,000 tons of nutrients, and hundreds of tons of strong

acids and heavy metals (copper, lead, molybdenum, and iron) from permolybdenum plants, are released into these rivers before crossing the border of Azerbaijan Outside the Baku/ Sumgait area. Only 9% of sewage water undergoes biological treatment and 36% receives no treatment at all. Runoff from agricultural areas adds large amounts of fertilizers, pesticides, and sediment. Of the population in Azerbaijan, 80% live in areas without modern water or sewage networks. The water pollution in this region is heavily intertwined with lack of proper waste disposal.^{xxii}

The vast Central Asia plains suffer from scarcity of fresh water. In this region, the overwhelming part of water and power resources is formed in mountainous areas. The mountain territories are the area for precipitation accumulation and glacier and eternal snow formation— the only sources of renewable resources of fresh waters. These sources are becoming increasingly at risk.

Environmentally hazardous trans-boundary sources of chemical pollution that travel through water bodies are slimes of antimonies, mercury compounds from Anzobski. They travel to the Zeravshan river. Also, Uzbekistan's metallurgic plant's

waste is deposited in the Syrdarya river, along with emissions of anhydrous hydrogen fluoride from the Tajik aluminum plant.^{xxiii}

Water scarcity is evident in Azerbaijan for example, where on average, water provided for agriculture falls short of the need by 3.7 km³/yr. Similarly, about 50% of the drinking water distributed to the Absheron Peninsula, where Baku and Sumgait are located, is lost from the antiquated pipe distribution system^{xxiv}. Of the population in Azerbaijan, 80% live in areas without modern water or sewage networks^{xxv}.

The heavy water pollution is also taking its toll on the wild life, such as fish which are also a nutritional commodity. Fishes of the Caspian Sea are seriously threatened: commercial species, especially sturgeon and salmon, by water pollution, damming of spawning rivers, and widespread illegal fishing. Fishes of Azerbaijan's inland waters—rivers, lakes, reservoirs, and canals—face a large pollutant and sediment load and heavy fishing pressure. Although this has been extensively reported from Azerbaijan, the Caspian Sea bordering several countries of this region is the dumping site of many plants. Pollution from the chemical plants of Sumgait, the oil

refineries at Baku, and inadequate sewage treatment from both cities makes these the most polluted parts of the coast. Offshore and onshore oil operations and polluted water from the Kura River add to the problem. Pollution in Azerbaijan's Caspian waters is increased by discharges from other countries^{xxvi}. Fluctuating water levels of the Caspian Sea wash pollutants from the land into the sea and flood or strand facilities and land. It seems the countries are harming each other by dumping their pollutants in shared bodies of water.

Also in this region, Afghanistan and Iran comprise about one-fourth of the global population, whereas they have only 4.5 per cent (1,945 billion m³) of the world's renewable water resources (43,659 billion m³) on an annual basis.^{xxvii}

In Azerbaijan, assaults on the country's soil resources include wind and water erosion, water logging and salinization, excessive use of fertilizers and pesticides, industrial waste, and deposition of airborne pollutants^{xxviii}. Erosion can be ascribed to overgrazing and forest cutting for fuel wood and pasture. Salinization occurs in poorly drained terrain, and accompanies irrigation at all stages as a result of rising saline water. The water

logging and salinization are due largely to faulty design of the irrigation distribution network and poor water management and distribution. About two-thirds of the arable land is affected by excessive salinity (1). Industrial activity, especially oil operations, has contaminated more than 60 000 ha (2). Atmospheric deposition of heavy metals from industries, power plants, and motor vehicles is a locally serious problem. These same issues are similar to the other countries in the region, such as Uzbekistan as alluded to by the UNEP.

Eastern Mediterranean

Observing the condition of water in the region over the past two decades portrays a lack of sufficient progress to meet the needs of the population in this region. The average person in other parts of the world has almost 5 times more water than a person in the WHO Eastern Mediterranean Region. There are two main problems when it comes to water in this region. First, the decreasing amounts, and secondly the hazards unsafe water is posing.

In 1991, it was said that water consumption per capita in the region, including for domestic, agricultural, and industrial uses, was very high, ranging from 300 to 1,500

liters per day (UNEP/WHO, 1991). Six years later the same report published, “Current water resources such as perennial surface water, renewable ground water, desalinization, and reclaimed wastewater are insufficient to meet expected demand” (UNEP GEO, 1997). This highlights the increasing environmental health concerns pertinent to this region, because throughout the past decade, not many improvements have been made.

In 2006 the WHO estimated 12-8% of the population in North Africa remained with “unimproved”^{xxix} drinking water, compared to 12% in 1990; and 10% in Western Asia compared to 14% in 1990^{xxx}. As of 2008, 18 million people in North Africa and 30 million people in Western Asia still remain without improved sanitation facilities^{xxxi}.

Another factor impacting both water and soil directly is waste management. Sanitation service quality is poor in this region. Wastewater discharge from major urban centers pollutes shallow alluvial aquifers and coastlines. Increasing volumes of wastewater generated by higher water consumption and urbanization. Rural communities remain inadequately serviced even more so, in terms of safe drinking water, sanitation facilities, and accessibility.

(UNEP GEO, 1997) In 1990, 28% of the population in North Africa and 20 % in Western Asia did not use improved sanitation, reported the WHO. And 18 years later, in 2008, it reported 11% of the population in North Africa and 15% in Western Asia still used unimproved^{xxxii} sanitation (including open defecation^{xxxiii}). Although this is progress, it is not enough – it is not fast enough to face the health challenges resulting in this region. Many of the diseases we observe to be transmitted through water are results of failed waste management. For example, *schistosomiasis* is a result of flukes which are known to transmit to humans from fecal matter in water

In 1992, the UNEP reported that, “extensive pressure from overgrazing, uncontrolled cultivation, fuel wood gathering, wind-blown soil materials, inappropriate use of irrigation water, uncontrolled urbanization, and sand encroachment have all contributed to the process of land degradation in the region”. Further research has shown that there is serious potential environmental degradation arising from toxic chemicals and hazardous and radioactive wastes. The phosphate industry, for example, is associated with environmental problems such as the contamination of water as a

result of wastewater from the washing of phosphates. This could potentially contaminate ground water. Gypsum, a by-product of the fertilizer industry, contains radioactive elements that affect ground water, as well as harmful heavy metals such as cadmium. In Jordan, phosphate residue is reported to cover up to 60 per cent of the total area (Tell, 1996).

Therefore, as the UNEP stated in its 1997 report, “Pesticide and herbicide use needs to be monitored because pesticide disposal is leading to edible-product contamination. Pesticide imports need to be controlled and should satisfy specified standards and meet the best technology standards.”

Gulf Council Countries

As this area is part of “West Asia,” refer to the above Eastern Mediterranean Region for statistics on drinking water and sanitation.

The majority of this region’s water resources consist of limited quantities of runoff resulting from flash floods, ground water in the alluvial aquifers, and extensive ground-water reserves in deep sedimentary formations. Some of these countries also rely on non-conventional water sources such as desalinization of sea and brackish water and limited use of renovated wastewater.

Ground water is the only renewable water source in most of these countries. (UNEP GEO, 1997).

A decade after this problem had been identified, at the WHO conference in Amman, Dr. Gezairy said, “Desalinated water and recycled wastewater account for 20%–50% of the total water withdrawals in Bahrain, Kuwait, Qatar and United Arab Emirates.” He also said that because the wastewater is not properly treated and managed, it cannot be reused to its full potential. As Dr. Gezairy mentioned, it is apparent that wastewater and drinking water management are highly correlated in this region, and clearly, wastewater management is having adverse effects on drinking water in this region.

Poor sanitation and sewage treatment systems, in addition to industrial wastes, are increasingly affecting water quality in the region. Only 20 per cent of urban wastewater is treated (World Bank, 1994). Concentrated industrial development is leading to pollution problems for ground and surface waters in certain areas (UNEP/WHO, 1991). Waste management is a severe crisis in this region because it directly causes air, water and soil pollution.

Existing wastewater treatment facilities face difficulties in handling the ever-increasing volumes of wastewater generated by higher water consumption and urbanization. Wastewater discharge from major urban centers is polluting shallow alluvial aquifers and coastlines. The quality of drinking water and sanitation services in most West Asian countries is poor, although it is improving in some cases. Efforts to achieve water quality targets established for urban areas are encouraging, but rural communities remain inadequately serviced in terms of safe drinking water, sanitation facilities, and accessibility. (UNEP GEO, 1997)

The most pressing environmental problem facing big cities in the region relates to waste management. As populations grow at an unsustainable rate, sewerage and other waste disposal systems are unable to cope with the volume, and environmental degradation sets in. The crowding of the poor in communities lacking infrastructure and decent housing leads to an accumulation of waste, which leads to contamination and attendant health hazards.^{xxxiv} With the rising populations in these countries, we can see the contamination and disposal system crises magnifying.

Failure to successfully cope with increasing waste and waste pollution impacts one of the major economic sectors of these countries: fisheries and other marine ventures such as coastal tourism. Also, oil pollution in the region is very pronounced, reported the UNEP^{xxxv}. In addition to the danger of oil spills from ship and pipeline accidents, chronic pollution occurs from disposal at sea of oil-contaminated ballast water and dirty bilge, sludge, and slop oil. Some 1.2 million barrels of oil are spilled into the Persian Gulf annually (ROPME/IMO, 1996).

The Red Sea and the Kuwait/Oman areas probably receive more oil pollution than anywhere else in the world (GESAMP, 1990). At the same time, the Mediterranean accounts for 17 percent of global marine oil pollution, even though it constitutes only 0.7 per cent of the global water surface (ESCWA, 1991). It has been estimated that in 1986 alone, nearly 3 billion tons of wastes (mostly ballast waters) were discharged into the Persian Gulf (ESCWA, 1991).

Although air pollution is a major issue for the entire Eastern Mediterranean region, it is even more so in the Gulf sub region due to the increasing industries. The UNEP reported that industries owned or subsidized

by the public sector have little access or incentive to adopt cleaner technologies. Protective trade regimes and the lack of environmental regulations have permitted the survival of old, highly polluting industries. Obsolete vehicle engine technology, low fuel efficiency, leaded gasoline, and high sulfur fuels have exacerbated urban air pollution (World Bank, 1994). (UNEP GEO, 1997)

Sources of Discrepancy

There is a gap in terms of the environmental health stressors between the urban and rural areas in these countries. Water pollution from industries impacts the soil farmers' use and the wastewater the rural inhabitants dump in rivers and lakes also affects the fisheries of the region and the drinking water of the urban areas and the rural areas. As a result of these differing activities, there are disparities in the concentrations of a problem in each region. In Western Asia, for example, there was an 18% difference in unimproved sanitation facilities between the urban and rural populations. Another issue to consider when evaluating statistics is that war torn regions are still recovering. Areas such as Sudan, Afghanistan, and Iraq are difficult to gather definitive data from because of the conflicts in the area.

History of Islamic Environmental ethics

Introduction

The following explores the manifestation of environmental health ethics throughout Islamic History. A proper understanding of the models discussed hereafter is crucial in the ultimate application of the environmental health ethics in Muslim cultures.

The challenge in building this model from archival sources is that we only catch a glimpse of the infrastructure and environment. Also, practices that have taken place are still being validated, or given credibility, with the advent of science (e.g., methods of irrigation). As we explore the heritage of environmental health within Islamic society, it becomes increasingly apparent that modern Muslim societies have lost touch with their roots and tradition concerning environmental ethics.

Furthermore, new concerns due to industrialized and globalized society have made their way to these societies, which have not been tackled by them in the past; however, the spirit of arriving at solutions and the methods by which these states have

done so in the past can put the present into perspective.

The history of environmental health in the Middle East (Goldschmidt, 2010; “middle east” is synonymous with the areas considered “Muslim”) consists of spirituality, science, and legal institutions. In the Spirituality, Prophetic Teachings, and Islamic Law sections of this Guidebook, an individualistic approach was explored; however, in the history of Muslim environmental health ethics there was also a collective state effort to uphold environmental health ethics. This effort was manifested in the scientific expeditions and legal institutions that took place during the Golden Age of Islam (i.e., 8th to 13th century).

The expansion of the Muslim empire highlighted an increase in scientific innovation. For the early Muslims, innovations in the sciences were a manifestation of environmental concern. As previously mentioned, successful civilization depends on effective management of waste, water, food, and

energy. So as they built their empire, they strived to make it efficient knowing that Allah witnesses their actions, and that Allah hasn't sent a malady for which there is no cure. This idea was the crux motivating not only scientists and doctors but also government officials and viziers for solving community issues.

Hence the environmental infrastructure and sustainability were fostered by the awareness of God (taqwa) whether or not it was spawned by love of Him and eagerness to learn more of His signs or out of fear of harming His creation and thus earning His displeasure. Either of the two perspectives aided the purpose of an efficient civilization; that gave its people the resources they needed for worship and worldly achievement.

There was also a method for motivating the public to adhere to the guidelines. Islamic law was the only legal practice when the empire was united. The natural environment in which it grew required moderation in all aspects of life and consequently the regulations and institutions concerning the environment were no exception.

Legal Institutions

To reiterate, there are three domains to the environmental-health situation in Islamic civilization. Islamic law influenced the politics, which deeply affected the scientific inquiry, which in turn was influenced by the spiritual domain of Islam. Islamic law used to be the only existent legal practice regulating the lives of Muslims. The result of such legal practice is evident in the rules relative to each aspect of nature. For example, there is a distinction between waters, rocks, plants, and animals. The use of rivers, wells, and springs had different guidelines when compared to guidelines concerning cultivated and uncultivated land. For instance, the *harim* was a protected area on which all development was forbidden, *hyma* were public reserves for preserving natural habitats, and *waqf* was donated for public use. After these practices were, over the years, done away with, the advent of secular laws did not include such extensive environmental procedures.

During this time, *Ihya*, *iqta*, *ijrah* were used for “expansion of waterways and revival of deserted areas and offered authorities chances to guarantee sustainable development of endangered areas” (Šafar, 2007, p. 4). Another very distinct position

that has not been used in centuries is the *hisbah/muhtasib* system. This includes the public service for efficient and just use of public and private areas, natural resources, and property all of which is delivered by an administrator under the supervision of a local judge. By the tenth century, *hisbah* institute was adopted by Egypt, from where it spread to North Africa (Izzi Dien, 1992). It is interesting to note that today a system with the same objectives (that were provided with the preceding system) is needed.

Politics and the Relationship Between Science and Law

Results of the relationship between science and law depended on the political context and stability of the caliphate. This triumvirate framework was established during the time of Prophet Muhammad (peace be upon him). It was also during this time that the purpose of these legal practices became evident. In other words, the purpose of environmental stewardship according to Islamic guidelines was clearly articulated. Mainly, this took place through the revelation of the Quran. Many verses indicated that the environment is a sign of God, and thus a clear method of knowing Him and drawing close.

During his lifetime (in the 6th century) in Medina (located in modern-day Saudi Arabia), most of the land was made into natural reserve. It was, for example, forbidden to cut trees in these lands. In the same area, there was an outbreak of malaria that stimulated sayings on hygienic practices (Shakir, 2008). Also around the same time, one of the Prophet Muhammad's companions, Othman (the third Muslim Caliph) bought the well of Ruma (a settlement in North West Arabia) and made its water available free to the Muslim community. It was (and still is) believed that "for every malady there is a cure," as the Prophet Muhammad is quoted in many sources to have said. Likewise, it was narrated from al-Miqdaam that the Prophet said: "No man eats better food than the one who earns it with his own hands. The Prophet David used to eat from what he earned with his own hands" (Sahih al-Bukhaari, n.d.) This belief yielded a strong work ethic which along with determination laid a foundation for scientific inquiry.

It was this spiritually driven scientific inquiry that gave rise to the Golden Age of Islam. Islamic law was also further developed during this time, especially concerning the establishment of institutions.

Umar ibn Abdel Aziz is seen as the icon of this time period (Goldshmidt, 2010). His rule can be characterized as the time when the Muslim empire saw justice at its maximum. He believed that, as Islam dictates, justice is the guaranteed efficiency.

Politics not only affected the psyche of the people but also affected the education communities received. According to Islam, it is the knowledge and understanding of creation that teaches Muslims how to take care of the environment and value all natural resources. So today, science has preserved the values promoted by Islam and Islamic law.

Science Education and Environmental Ethics

“Science bears an important role in Islam because Muslims believe it to be a way to God; thus, studying God’s work leads Man to his Creator,” (Šafar, 2007). Morgan (2007) further supported this by pointing out that many of the men excelling in theology will also contribute to translation and mathematics and medicine and more... the scholars see all these studies and phenomena as mosaic windows into a much larger connected reality, which is God’s universe.

Most importantly these men do not see it as their purpose to force their scientific research to fit a preconceived notion of the universe dictated by theology. Instead, they see that their mission is to try to understand the complexity of creation, as hard or even as impossible as it might be to do.... The first major urban hospital anywhere will go up in the tenth century. (p. 61)

This implies that the quest for knowledge was vertical rather than horizontal; therefore what was being studied was respected simply because it brought one closer to his Creator and also because of its direct implications on creation (Nasr, 1968). These centers of education had a methodology for teaching: math and science was taught first, and then the social sciences were taught. The methods for teaching social science relied heavily on scientific knowledge and logic obtained from deep mathematical studies – therefore in most of the *madradas* (i.e., religious schools) science was taught next to Islamic jurisprudence (Khaldun, 1958). This, the educators believed, had an impact on the students because those that focused more in the law and politics still had the understanding of the integral role science has within Islam’s framework and its applications. Scientists would be able to aid

the ruler in solving the issues that arise with foresight into the purpose of the nature of the law. (Morgan, 2007). A good example of this in practice is the fact that Caliph Ma'mun's sponsored scholars in numerous sciences.

It is important to note that such learning caliber would not have been possible without the leadership of the caliphate, some of whom chose scholars as their companions in the court and allowed the love of knowledge to thrive. At the *Dar al Ilm* and *Nazmiyat*, caliphs opened their doors to scholars of language, history and science. The power of knowledge appeared as the caliphs also sought to apply what knowledge was found to better the empire.

As time passed and the educational system developed, scientists thrived in developing a deeper interaction between humans and the environment, and explored practical methods for the laymen to ameliorate their interactions.

Scientific Works Directly Related to the Environment

Health. *Adwah* is the Arabic word used to refer to contagious disease, such that they can be spread through air, water, and waste.

This subject is critical and was heavily explored by the scientists of the Golden Age of Islam. The scientists delved into ways in which humans should interact with the air, water, and waste in a manner protective of their health, which is at the same time protective to the resources themselves.

Qusta ibn Luqa wrote a treatise called *On Contagion* in which he wrote on air pollution that the surrounding air differs greatly according to different effects on it... factors include vapors ascending from forests and swamps, ground humidity such as the smoke ascending from mountains and furnaces... and other spoiled things which emit bad fumes and stinky odors when heated by sun and nature. (Levey, 1973) He also wrote a traveler health guide for pilgrims to Mecca that included chapters on the examination of different waters in order to find out which one is safest, and the improvement of contaminated water. Al-Razi, also from the same time period, wrote *On Types of Water*, in which he discusses the medical, geological and physical points of water. In addition, he was one of the first to explain the positioning of housing uphill and upwind from infected or polluted areas. (Al-Razi, 1984; Goodman, 1995; Hau, 1977)

Al-Tamimi's work on the other hand was more applicative. His treatise had a table of contents that included: the description of polluted air types in the Islamic states and their relations to weather geographical conditions, diseases resulting from air pollution and their infectious nature, hygienic procedures for protection against contagion, treatment of stagnant water which produces various types of pollution. In addition, the doctor Ibn Sina, also known as Avicenna, wrote extensively on environmental health. His *Canon* devotes chapters to moldiness, types of water and treatment, illnesses caused by water impurities, air spoilage and its effect, designing houses and selecting their location according to health considerations, food quality and its effects, and animals transmitting pollution (Dols, 1978; al Baba, 1984)

Ali ibn Ridwan of the 11th century and Ibn Jumay' of the 12th century wrote about Egypt's environmental health. The former wrote about the specific causes of pollution in Metropolitan Cairo, and compared it to the rural areas. He also wrote on methods of improving air water, and food quality in Egypt. The latter wrote about Alexandria. He conducted field reviews of drinking

water sources and how their pollution and also conducted studies on types of food and drinks. Thereafter he provides counsel on eliminating pollution and avoiding illnesses. (Dols and Gamal, 1997; Ibn Jumay)

Lastly, the Baghdadi physician, 'Abdallatif wrote *On the Prevention of Bodily Ills in Egypt* which contains a study of the Nile River and its risings. It also includes the proper design of houses and city planning. "He observed the use of wind catchers or towers containing ventilation shafts in houses. The Egyptians had firm sewage channels" (Zand & Videan, 1965, p. 179).

Another practical subject the scholars explored was that of herbal remedies. The most famous work is Ibn al Qayim's *Prophetic Medicine*, and Muslims around the world still reference the book today. Extensive research was also under taken on animal species with respect to their care and domestication, and their disease carrying abilities. As for the latter, it was relevant with the outbreak of the plague, and outbreaks of malaria, for example. In Ibn al Qayim's *Prophetic Medicine*, he advises those in an area with the plague not to leave their homes, not even to flee (Dols, 1978).

Infrastructure. Another topic of interest today is infrastructure. How were cities in the Islamic empire built for maximum efficiency? Each region had its own method. In the Iberian Peninsula, under the Umayyad rule, the Muslims irrigated Spain and Sicily. They also knew how to drain rivers and irrigate their fields by systems of branch channels. They captured rainwater in trenches on the sides of hills or as it ran down mountains (Scott, 1904). With regards to their waste management, Cordoba had the first waste containers and waste disposal facilities for litter collection.

In North Africa, under the Fatimid and Ayubid rule, innovation in water management systems thrived. The *qanat*, for example, is a water management system known for its reliability in arid and semi-arid climates. It was used to provide a reliable supply of water to human settlements and for irrigation in hot, arid, and semi-arid climates. (Dols & Gamal, 1997)

In Algeria, *foggaras*, a network of underground galleries, conducted water from one place to another over very long distances so as to avoid evaporation. Although the system is still in use today, the

tendency at present is for over-use and waste of water (Ibn Jumay). Farmers in that region would also use the clepsydra to determine the duration of water use for every user in the area (Goonalons, 1943). “Each farmer is informed of the timing of his turn, and required to take the necessary action to ensure effective supply to his plot,” (Ibid, 1943).

The Crumbling of Science, Legal Institutions, and Environmental Ethics

Despite all the advances, this golden age of Islam eventually ended. Though many are convinced that the rule of Muslims ended abruptly with colonialism, history testifies that a phase of corruption overwhelmed Muslim rule first. This corruption threatened politics, religious authority, and the quest for applied science. This appears first under the Abbasid rule. In 956, it is reported that Mu'izz al Daula procured funds from improper sources and granted land belonging to the state to Turks and officers (Amedroz, 1993).

Centuries later the Mamluks saw degradation in knowledge and public works (e.g., irrigation). “By the 18th century the mamluks... caught up in factional

struggles... failed to provide the irrigation works and security needed by the peasants... The madrasas, including university of al-Azhar declined in intellectual caliber” (Goldschmidt, 2010, p. 161). Along with the Mamluks, the Ottoman rule signaled the fall of not only Muslim rule, but also a sense of a global Muslim community. For example, along with the rest of Syria, Baalbek, fell to the Ottomans in 1516 which “marked the beginning of their decline” (Cultural Heritage Report, n.d., p. #).

More recently, during the 1930s, after Kemal Attaturk came into power in the area of Turkey, “agrarian reform limped in this land... but agricultural training institutes, extension agents, rural health, adult education centers, and model farms did lead to some improvement,” (Goldschmidt, 2010, p. 224)

Colonialism not only impacted the politics of the region by the 19th century, but also continued to sever the tie between politics, religion, and science to this day. This was the accepted reality since the middle of the 19th century: Muslims no longer dictated the rules. “The damage caused to the structure of Muslim countries was further threatened by poverty, demographic explosion and

armed conflicts” (Šafar, 2007, p. 12). The increase in colonialism directly correlated with a rise of nationalism. “Today nationality is gaining importance for Muslims all over the world, threatening the universal and connecting power the Islamic law used to hold over every individual,” (Goodman, pp. 40-41). The major implication of nationalism is the near sightedness of community extending only to the individual’s country – not the Muslims in general. Islamic law, on the other hand, focuses on the benefit to the Muslim community. If that community is no longer perceived, so is the purpose that came with it. Therefore, this decreased the quest of knowledge *for the sake of God* as it used to be. Public service projects with a pragmatic motive hence declined.

It appears that the broken tie between politics, law, and religion yielded a lack of communication and tolerance between the leaders of each, further. It is sufficient to reflect on the situation today. A question to ask is: Did loss/decrease of science and knowledge lead to corruption? Or did corruption result in declining education and understanding/science? For example, the minister of agriculture in Egypt was displaced from position in the Spring of

2010 despite many journalists claiming he had achieved positive reform (see *Ahram*, 2011).

On a more positive note however, Singapore's Muslim community works together to foster environmental awareness. They hold competitions for the most environmentally friendly mosque built. Furthermore, the government not only limits

the concentration but also states that "it shall be the duty of the owner or occupier of any industrial or trade premises to conduct any trade or industrial process or operate any fuel burning equipment or industrial plant in or on the premises by the best practicable means available as may be necessary to prevent or minimize air pollution," (Environmental and Protection Act).

Recent and Current Initiatives

After examining some of the environmental health problems in the Muslim world, we may then explore examples of progressing initiatives and policies that have taken place thus far. Since most of the information gathered is from the 1990's, many projects since then have been initiated to combat the health concerns resulting from the environment, yet have not had enough impact. The lack of impact results from short term initiatives, or in other words, lack of sustainability.

Creating sustainable infrastructure is a key step in addressing the environmental health ethics in predominantly Muslim developing countries. As discussed previously, without sustainability, the people of these countries would be lacking necessary tools to facilitate their interactions with the environment. Even if the majority of people decide to take responsible actions, defective infrastructure could make their efforts fruitless.

A case in point for the necessity of sustainability is water. We observe that the majority of the water usage is attributed to agriculture, which is not surprising as many of these regions have a low average rainfall while irrigation of crops is a necessity.

However, one of the main causes of high water consumption is the limited use of water-saving irrigation techniques and the planting and growing of crops or cattle raising that need large amounts of water. For example, beef production is particularly water intensive. To produce 1 kg of beef, 100 000 kg of water are needed.¹ For example, in the Eastern Mediterranean Region, the present water use for agriculture is above 90% in 10 countries, between 70% and 90% in 8 countries, and between 55% and 70% in 4 countries; these latter are small countries that have virtually no agriculture production¹.

As water scarcity becomes more acute in these regions, water will have to be recycled and reused more frequently in the future. The recycling will increase the chance of water being polluted. Also, because of the impending water shortage, water supply systems will only be able to provide water to customers on an intermittent basis. This will increase the chance of water supply contamination. Already in many cities and rural communities, intermittent water supplies are common. As the water scarcity increases, intermittent water supply will

increase even more. In addition, a water supply system that leaks and whose pipe joints are not watertight is in danger of being polluted by contaminated groundwater outside the pipes. This is a particular hazard when sewer pipes are laid close to water supply lines.

An example of the direct impact of infrastructure on health is the cross-connection of pipes. The problem of cross-connection between water and sewer pipes has been cited as the cause of outbreaks of cholera, hepatitis, typhoid and other waterborne diseases in these regions ¹. Lastly, the reuse of treated wastewater for agriculture (which is a promising method to conserve water) will surely increase. Such an increase may bring with it additional potential health risks.

If more efficient methods of utilizing agricultural water were used, the regions' water consumption would decrease dramatically. Also, if leaks and pipes were fixed, the water consumption would decrease as would many waterborne diseases.

As we explored above, the solutions in place are usually part of a bigger problem, such as

the groundwater extractions. We need to reach the cause of the issue, not only the "symptoms".

There are several countries that have begun to address their environmental concerns in their policies. *These countries' progress in sustainability is a model for the countries in these regions.* For example, Indonesia placed a tax on carbon emissions and Iran has invested in the education sector.

Tehran University, as a state institution employed more than 45 predominantly foreign educated faculty in its Environment Program. It offers dozens of courses in all aspects of environmental management, engineering, and design. With respect to specific state politics, the environmentalist movement represents an important part in expanding security (*amniyat*) and welfare (*refah*) beyond the preservation of the political order to include environmental security and environmental welfare against the hazards of pollution, toxic chemicals, deforestation, biodiversity depletion, and threats to public health, (e.g. infectious disease).

Not only is this trend in environmental progress because of Iran's "environmental

crisis,” but also have emerged in line with the ecological wisdom of the Islamist polity whose Constitution, Article 50, deems environmental welfare (*hefz-e mohit-e zist*) as a "public obligation" and forbids "all activities, economic or otherwise, which may cause irreversible damage to the environment"^{xxxvi}

Indonesia also has an environmental focus in education. In Central Java, for example, is the Ilmu Giri Pesantren, an Islamic boarding school that teaches its students about the environment’s integral part of Islam. Environmentalism had been taught in Indonesian Islamic boarding schools, known as pesantren, since at least the 19th Century. One of those schools still exists, and it is called Al-Nuqayah, which was established in 1887. Its founder, Muhammad Syarqawi taught the island’s villagers, with the help of the Quran, about conservation.

There is also the Wahid Institute, an organization founded by Indonesia’s former president Abdurrahman Wahid that has been working to promote “Green Islam” within Indonesia’s pesantrens.^{xxxvii}

Although creating sustainable infrastructure through progressing policies and school

curriculums is ideal, working from the “grassroots up” is just as effective if not more, than waiting for policies to change. This is the kind of effort displayed by Muslim minorities in the United States and the United Kingdom.

Youth in the developing regions could start personal initiatives at community centers, high schools and college campuses as did the Muslim minorities abroad. Several projects could begin on a small-scale yet make an impact on the community and mentality of the public.

For example, recycling collection centers for plastic and paper could be set around the community for convenience. Paper collection can take place at the traditional *dar* or religious circle geared toward youth. Not only do these *dars* serve for religious knowledge, but the attending youth often learn arts and crafts. Perhaps creating innovative methods for recycling could be included in the teaching material as well. Plastic can be used to make clothing, but this requires more involvement and education, and is therefore better suited for a campus initiative/project. Organic material should be used for gardening as compost. This project is feasible at *the nady* or the

community center. And these various collections need to be advertised for effectively.

Another issue to be addressed by youth is the conservation of water. Initiatives to collect water are feasible for watering plants or for cleaning purposes. Awareness especially needs to be spread about water conservation. Perhaps a cartoon educating the public would also prove effective as it did in Yemen.

Similar methods have been effectively used by Muslims abroad. In the United States and United Kingdom, Muslim minorities have practiced Islamic pro-activism to achieve results. These individuals have taken responsibility for the environment they live in.

In the United States, for example several groups have commit not only to preserving the environment by their actions, but also to educating others about the integral role protecting the environment plays in Islam.

The group called “Green Deen” started an initiative called: Green Khutbah at a Masjid Near You! The group asked mosques to participate in encouraging the Muslim

community to get serious about going Green during the *khutbah* or Friday sermon. On June 12, 2009, seven mosques in California, two in England and two in Ghana participated.

Another group, the Islamic Environmental Group of Wisconsin,



shares Islamic environmental teachings with its members, the larger Muslim community and the general public. They work to apply teachings to daily life and volunteer with interfaith environmental organizations. IEGW completed a successful energy awareness campaign in the fall of 2007. They garnered more than 100 pledges to use energy saving compact fluorescent light bulbs (CFLs). Those pledges prevented 122,700 pounds of greenhouse gas emissions.

The organization also holds free workshops for Muslims where participating individuals and families learn ways to apply the Islamic environmental and stewardship teachings to their daily lives, reduce waste, conserve energy and water, eat healthier foods and

build a stronger sense of community.
(www.sierraclub.org/partnerships/faith)

Also in the United States, Community leaders are urging worshippers to *carpool to attend Friday prayers and nightly Quran recitations* held at mosques during Ramadan. At mosques in California, car pooling services for seniors has been going on since 2007.

Community leaders say the Quran and the teachings of Prophet Muhammad set clear mandates for Muslims about their role in environmental stewardship. *Mosque leaders plan to use nightly "Taraweeh" prayers during Ramadan to spread such messages that would be a tough sell any other time of the year.*

The Mosque Foundation, one of the larger suburban mosques, is a leader in the green movement. The foundation recently opened an energy-efficient building that incorporates natural light, uses solar panels for heating water and carpeting made of recycled materials. It's also promoting recycling.

In the United Kingdom, there are several Muslim-run environmental organizations

such as Wisdom In Nature (WIN) and the Islamic Foundation for Ecology and Environmental Sciences (IFEES). Wisdom In Nature has organized many campaigns since 2005. The group began an online exchange where people exchanged things they no longer need that others did. This was to provide an alternative to mindless consumerism and contributions to the waste cycle. They have organized workshops throughout the United Kingdom on: Islam & ecology/economy an Islam & permaculture, and climate change. They have also sponsored organic picnics and community ecology outings.

Another organization, IFEES, works to increase knowledge and awareness of Islamic teachings that address the environment and environmental health, change attitudes and behaviour that cause major environmental problems such as climate change, deforestation, desertification, pollution, and to alleviate poverty through projects specially designed to deal with sustainability issues. The group has collaborated with others in Indonesia for example in efforts to build a park in Sumatra.

As seen above, the critical issue is education that combines both the Islamic

tradition and scientific knowledge related to the environment and environmental health. With education, and encouraged action, improvements are being made. However, much more such initiatives and grassroots education will be needed to

return Muslims to their Environmental health ethics taught to them over 1400 years during the life of the Prophet Muhammad (peace be upon him) and the early Muslims.

And God knows best...

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ⁱⁱ Asoon.org

ⁱⁱⁱ Refer to appendix for spreadsheet; census projection from asoon.org

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^{xxvi} United Nations Development Programme 2000. *Azerbaijan Human Development Report 2000*. Baku, 83 pp.

^{xxvii} UNEP South Asia Report (fresh water)

^{xxviii} Napier Shelton, Azerbaijan: Environmental Conditions and Outlook

^{xxix} Define unimproved WHO standards

^{xxx} WHO 2006 Water and Sanitation Report

^{xxxi} PROGRESS ON SANITATION AND DRINKING-WATER 2010 UPDATE (WHO)

^{xxxii} do not ensure hygienic separation of human excreta from human contact. Unimproved facilities include pit latrines without a slab or platform, hanging latrines and bucket latrines.

^{xxxiii} when human feces are disposed of in fields, forests, bushes, open bodies of water, beaches or other open spaces or disposed of with solid waste.

^{xxxiv} (UNEP GEO, 1997)

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^{xxvii} <http://www.globalpost.com/dispatch/indonesia/091111/islam-environment-indonesia-green> (accessed 5/17/10)