Sustainable architecture through Islamic perspective: a case study in Old Mosul residence area

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Sustainable development may be defined, from an Islamic point of view, as a multi-dimensional process that seeks to strike a balance between economic and social development on one side, and the environment on the other. It seeks for humans to use resources in the best possible way. There are numerous citations from the Qur’an and the Hadiths (sayings of the Prophet Mohammad) that mentioned the wise utilization of natural resources. They all lead to the conviction that all elements, species, habitats and ecosystems are part of the perfect universe created by GOD. Hence, respecting the law of nature and all its components is an obligation of every Muslim, who by definition has “submitted” himself, body and soul, to the Creator. Depending on the main Islamic concept in the Qur’an “And remember when He made you successors after the 'Aad and settled you in the land, [and] you take for yourselves palaces from its plains and carve from the mountains, homes. Then remember the favors of Allah and do not commit abuse on the earth, spreading corruption.” (Al-'Araf, 7:74), this paper tried to discuss the main principles of Islamic roles that deal with nature as a main resource to architecture and built up area and human as a wise and rational consumer for these resources. The paper aims to increase awareness to the importance of the theme of sustainability in architecture by expounding the core of the conceptual basis for the same. It also presents some general principles and ideas around which a comprehensive theory on sustainability in Islamic architecture, in line with the requirements of the Islamic worldview while fully conforming to the dictates of different circumstances, environments and cultures, can be developed today. To deal with such an issue, the paper will try to project the built environment and architecture of the old resident area of Mosul city within the Islamic principles of living to investigate how Islam deals with such an environment and its resources sustainably.

Environmental ethics in Islam

The ethical base of Islam, which is derived from the imperatives laid down in the Qur’an and expressed in the practice of the Prophet, comes under numerous headings. They can however be distilled into just three categories bearing in mind public good to be the ultimate objective. They are to do what is right, forbid what is wrong and act with moderation at all times: “Let there be a community among you who call to the good, and enjoin the right and forbid the wrong. They are the ones who have success” (Al 'Imrân, 3:104).

As Abed Al-Rahim (2010: 2-13) refers, the Qur’an uses an environmental theme in exhorting humankind to be moderate, “it is He who produces gardens, both cultivated and wild, and palm trees and crops of diverse kinds and olives and pomegranates both similar and dissimilar. Eat of their fruits when they bear fruit and pay their dues on the day of their harvest, and do not be profligate. He does not love the profligate” (Al An’âm, 6:141).

The Qur’an refers to creation or the natural world as the signs (ayat) of Allah, the Creator. Ayat means signs, symbols or proofs of the divine. As the Qur’an is proof of Allah so likewise is His creation. Islamic unique perception of man and his position on earth necessitated the formation of a compelling and comprehensive view of the natural environment as well (Nasr, 1993: 130-131). This is so because man totally depends on nature for his survival. Also, nature is a ground for man’s realization of his spiritual purpose on earth. Simply put, man is an integral part of the total natural setting. Man is nature himself, sustaining nature means sustaining his self, damaging nature means damaging his self and his prospects of a civilization achievement.

Owing to all this, Islam attaches so much importance to the subject of environment clearly expounding man’s rights over it and his responsibilities towards it. Islam teaches that environment is part of the universal web of creation. Its role is two-fold: to worship its Creator (in ways suitable to it), and to be subjected to
serve the exigencies of man, so that God’s vicegerent can smoothly carry out his honorable task of managing earth. (Omer, 2009: 115-116).

**Basic roles of sustainability in the Qur’an**

1. The Qur’an highlighted some principles and guidelines on sustainability, which include (Matali, 2012: 35-38):
2. Adl (Justice) - governing human relationships and other living creatures;
3. Mizan (Balance) - governing not only human social and economic relationships but also the environment, especially in ensuring the equilibrium of nature, the use of resources and life cycle of all species;
4. Wasat (Middleness) - choosing the middle path in economic planning, social conduct, scientific pursuits, ideological views, material, water and energy consumption;
5. Rahmah (Mercy) - governing all aspects of human relationships and treatment of all living animals, plants and insects including micro-organisms;
6. Amanah (Trustworthiness and custodianship) - Humankind is considered to be a trustee appointed by the Creator, for all earth’s assets;
7. Taharah (Spiritual purity and Physical cleanliness) - generating contented individuals through spiritual purity, conscious of the presence of his/her Creator, that would result in a balanced society, living in harmony with the environment; cleanliness that would generate a healthy society devoid of air and water pollution, as well as generating a clean economy devoid of usury and deceitful marketing techniques and business transactions;
8. Haq (Truthfulness and Rights) - Truthfulness in all dealings that recognizes the respective rights of others (humans, animals and plants);
9. Ilm Nafi’ (Usefulness of knowledge and science) - Knowledge, whether theological, scientific or technological, must be beneficial to others (individuals and society) including future generations.

**Sustainable architecture**

Environmental sustainability is a concept coined at the Johannesburg Summit on Sustainable Environment (2002) where the concept of Sustainable Development was redefined to mean that all development must stand on three pillars (Figure 1): economic development, social development and environmental protection. If any of the three pillars is overlooked in our development strategies and work plans, such developments cannot be called sustainable development. Environmental sustainability ensures that the harmonization of the three concepts is applied by planners and developers in practice.

Sustainable architecture is a general term that describes environmentally conscious design techniques in the field of architecture. It is framed by the larger discussion of sustainability and the pressing economic and political issues of our world. According to LEED rating systems, sustainable architecture seeks to minimize the negative environmental impact of buildings by enhancing efficiency and moderation in the use of materials, energy, and development space (USGBC, 2005: 4). The idea of sustainability, or ecological design, is to ensure that our actions and decisions today do not inhibit the opportunities of future generations. The term can be used to describe an energy and ecologically conscious approach to the design of the built environment.

![Figure 1: An indication between the three pillars of sustainability (Scott, 2009, p. 36)](image_url)
On the other hand, architecture, in general, should always be in service to people. It is never to be the other way round, that is to say that architecture should evolve into a hobby or an adventure in the process imposing itself on society while forsaking, or taking lightly, people’s identities, cultures and the demands of their daily struggles. Architecture, first and foremost, should remain associated with functionality. It should not deviate from its authentic character and stray into the world of excessive invention and abstraction. (Bianca, 2000: 40)

Central to Islamic architecture is function with all of its dimensions: corporeal, cerebral and spiritual. Form divorced from function is inconsequential (Omer, 2009: 112). This, however, by no means implies that form plays no role in Islamic architecture. It does play a prominent role, but its relevance is a supportive one supplementing and enhancing function. Form is important, but in terms of value and substance it always comes second to function and its wide scope. There must be the closest relationship between the ideals that support the form of buildings and the ideals that support their function, with which the users of buildings must be at ease. A conflict between the two is bound to lead to a conflict of some far-reaching psychological proportions in buildings users. This way, the roles of form become equivalent to the roles of function.

The Islamic built laws
The built laws or principles as mentioned in Fiqh books illustrate the responsibilities of both individuals and authority in Islamic law (Hammad 1997: 54-60). Hakim (1986: 6) defines Fiqh of building processes as: "the mechanism of interpreting and applying the value system of the shari'a (Islamic divine law) within the processes of building and urban development... its primary sources, the Qur'an and the Sunna (or traditions of the Prophet) are crucial for the transfer of the value system to design and urban form." Islamic built laws were used to define the rights, responsibilities of people and how to respond to one's needs as outlined above without conflicting other people's interests (Al-Ibrahim 2003: 63-80). In this sense, Akbar (1988: 20) pointed out that Ahmed (2003: 12) suggested that the Islamic built laws (driven from Islamic principles) can be listed as the following:

No-harm principle:
No-Harm principle means that residents' initiated action, which is considered harmful to others, should be prevented when affected people ask so (Hakim 1983: 32).

Openings and projections:
Akbar (1989: 28-35) stated that any individual could project part of his upper floor, such as Mashrabiyyahs or cantilevers, on to a through street as long as no damage is caused to the public. Projecting cantilevers over main roads are permissible because the roads are the remains of ‘dead’ lands that could have been ‘revived’ in the past. He/she can also open windows and doors on to these roads providing they do not cause harm to their neighbors.

Right of appropriation of open spaces
As long as this causes no harm, residents should be free to appropriate open spaces in their residential settlements for a wide range of social and economic activities determined and permitted by the residents themselves without outside intervention (Akbar 1989: 29, and Hakim 1986: 9).

Right of easement (servitude) (Irtifak)
Right of easement (servitude) is an exclusive benefit of a property over another adjacent to it, where the two are owned by different owners. This benefit belongs to the first property, even if its owner changes, unless this benefit has been relinquished through a conventional transaction (Akbar 1988: 28).

Right of pre-emption (Shufah)
The right of pre-emption (Shufah) is the right of a neighbor or a partner to substitute himself/herself for the buyer of an adjacent property or structure when offered for sale by another neighbor or partner (Akbar 1988: 29).
The above principals have defined the user’s rights in terms of how to build, alter or extend his/her property. They also provide a flexible framework to the property user/owner that enables him/her to change his property without harming his neighbors and violating their rights.

Sustainable issues in Islamic architecture

The use of resources

Central to the understanding of Islamic architecture, as both a concept and sensory reality, is the understanding of the Islamic concepts of man and the environment. This is so because it is man who perceives, creates and uses architecture. It is man who produces or destroys architecture. It is man who enjoys or suffers from architecture. Furthermore, architecture and natural environment are inseparable, at both the conceptual and practical planes. The environment holds enormous potential and diversified resources meant only for man, God’s vicegerent on earth. They are to be seen as the facilities which facilitate each and every aspect of man’s fleeting stay on earth. The environment is further to be seen by man as an “ally” or a “partner”, so to speak, in the execution of his earthly mission. After all, in order to create an architecture, man borrows diverse natural ingredients, such as space, water, clay, timber, stone and other minerals, placing the newly created or built elements back into the existing natural contexts. In other words, the built environment is in so many ways the natural environment that has been borrowed, utilized, manipulated and processed. Man himself constitutes a part of the universal natural setting. It goes without saying that some of the most prominent features of Islamic architecture must always be as follows: it is heavily loaded with the Islamic spirituality; it is economic and safe; it is users friendly; it is environment friendly; and, it is sustainable.

Complementary with context

It is the nature of Islam that provides humanity with basic rules of morality and guidelines of proper conduct in those spheres of life which are not related to prescribed ritual worship, such as the spheres of building, planning and general development, for example. Upon such general principles and guidelines, people can establish systems, regulations, views and attitudes in order to comprehend and regulate their worldly life in accordance with their time, region and needs. Since every age and geographic location have their own problems and challenges, the solutions and perceptions deduced from the fundamental principles and permanent values of life have got to be, to some extent, different. Their substance, however, due to the uniformity and consistency of the divinely given foundation and sources from which they stem, will always be the same. Islam is based on essential human nature, which is constant and not subject to change according to time and space. In addition, Islam ensured the right of natural resources exploitation (sun, air and water) for all, without abusing the individual rights on others.

Diversity with unity

Muslim architects tend to, firstly, identify the general Islamic guidelines and principles pertaining to the enterprise of sustainable building, on top of which are those related to the notions of man and the environment in Islam. Next, they must be aware of the implications of the challenges of regions diversity in which they live entail. If something was the norm during a period and in a particular ecological setting, such by no means can be the same in every subsequent period and in different ecological settings. Technological advancements rapidly change; demands of different eras fluctuate, even under the same ecological conditions; climate exigencies must be painstakingly heeded; and, lastly, human psychology also changes with the change of time and space posing a number of exigencies of its own. No architectural plan and design which served as a solution for an age and place can be simply copied to another age and place without properly modulating it to its environmental and socio-cultural requirements. To do that is to betray the dynamic spirit of both the common sense and the perpetual message of Islam. Blind and ignorant imitations, even in sheer religious matters, are categorically rebuked by Islam. By taking hold of the general Islamic guidelines and principles with reference to creating a sustainable architecture, on the one hand, and by studying the needs of different times and situations so that the former can be accurately understood and applied, on the other, Muslim architects in reality perform a degree of ijtihad,. In doing so, in no way can a
serious, enlightened, accountable and willing person be a loser as far as the execution of matters ordained by
God is concerned. He can never be wrong. Verily, this divine assurance should serve to the Muslim architects
and designers as a starting point to look carefully and critically at the state of architecture and how buildings
in the Muslim world are planned and designed, as well as to start contemplating the prospects of finding
much better sustainability solutions which will be inspired by and infused with the values of Islam, and will
be responsive to the exigencies of different times and regions.

The research objectives and methodology

The objectives of the research are to study how far Islamic values and sustainable architecture have been
applied to residence area in old Mosul city (MOC) in Iraq country. The research main question is lay under
the investigation of how much Islamic architecture and sustainable architecture principles are synchronized.
The research objectives are carried out through a pilot study in a selected area on the inner city, data is
obtained with survey as a purposive sample, building sketches and photographs.

The case study: Mosul Old City

In the Mosul Old City in Iraq, urban tradition is greatly presented as demonstrated by the traditional alleys,
houses doorways, the old Islamic public buildings. For testing the theoretical framework (Islamic roles and
principles mentioned above), a part of the historic fabric of (MOC) has been selected, (Figure 2). The case
study has been elected due to the variety of its building types and their ages; purposes and types. It includes
several houses in Mosul, a number of public buildings like public baths, schools, and some significant
religious building (mosques).

Sustainable architecture within MOC

The form of Mosul urban fabric returns wholly to Arabic, and Islamic in fluencies. It does not generally
differ from any other Arabic–Islamic city. It is, however, considered the production of this great cultural
tradition.

The table below (Table 1) indicates manifestation of architectural sustainability, which have been
obtained during survey, such appearances dealt with the concept of sustainability spontaneously, due to the
(conscious) involvement of designer and architect within Islamic principles and roles.

The survey also indicates that the use of these concepts were at macro and micro levels of the architecture
and the urban design of the built environment, and muslim architect dealt with such environment with various
degrees of awareness, to establish safety and humanity, with wise and various use of natural resource.
Figure 2: Layout of Mosul old city within whole fabric of Mosul (Directorate of Municipality of Mosul city)

Table 1: Indicates some of architectural sustainability appearances corresponding to Islamic principles in old Mosul city.

<table>
<thead>
<tr>
<th>Example</th>
<th>Sustainable appearance</th>
<th>Sustainable issue</th>
<th>Islamic role &amp; Built law</th>
<th>Related Qur’anic verses or prophetic hadiths</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Image]</td>
<td>The compact grain with organic fabric and space hierarchy</td>
<td>The wise Use of space Resources</td>
<td>Wasat (Middleness) Openings and projections</td>
<td>&quot;That home of the Hereafter We assign to those who do not desire exaltedness upon the earth or corruption. And the [best] outcome is for the righteous&quot;. Al-Qaṣas(28:83)</td>
</tr>
<tr>
<td>![Image]</td>
<td>Solidity of external façade and internal opening to sky</td>
<td>The use of available recourses for environmental comfort</td>
<td>Mizan (Balance) and Right of appropriation of open spaces</td>
<td>&quot;... , We would have opened upon them blessings from the heaven and the earth; ...&quot; Al-'A'raf (2:29)</td>
</tr>
<tr>
<td>![Image]</td>
<td>The efficient use of local space within appropriate function</td>
<td>The wise use of plot Resources</td>
<td>Mizan (Balance) with no wasteful, and No-Harm principle</td>
<td>&quot;Indeed, the wasteful are brothers of the devils, and ever has Satan been to his Lord&quot;</td>
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<tr>
<td><img src="image1.png" alt="Image" /></td>
<td>The use of built tunnels for natural ventilation</td>
<td>The use of available recourses for environmental comfort</td>
<td>Mizan (Balance) with no wasteful, and Right of appropriation of open spaces</td>
<td>&quot;... , And Allah has made for you, from that which He has created, shadows and has made for you from the mountains, shelters and has made for you garments which protect you from the heat and garments which protect you from your battle. ... &quot; - An-Nahl (16:81)</td>
</tr>
<tr>
<td><img src="image2.png" alt="Image" /></td>
<td>The efficient use of local materials in construction (stone, gypsum, local marble and wood,) all material are recycled</td>
<td>The wise use of local material Resources</td>
<td>Ilm Nafi’ (usefulness) and No-Harm principle</td>
<td>&quot;It is He who created for you all of that which is on the earth. ...&quot; Al-Baqarah (7:96)</td>
</tr>
<tr>
<td><img src="image3.png" alt="Image" /></td>
<td>The inner well for water, the use of natural ventilation</td>
<td>The optimum use of natural Resources</td>
<td>Ilm Nafi’ (usefulness)</td>
<td>&quot;It is He who sends down rain from the sky; from it is drink and from it is foliage in which you pasture &quot; - An-Nahl (16:10)</td>
</tr>
<tr>
<td><img src="image4.png" alt="Image" /></td>
<td>Respecting the privacy between residence in the neighborhood with right of pre-emption</td>
<td>The use of building shade to protect allay</td>
<td>Rahmah (Mercy) and the right of easement (Irtifak)</td>
<td>The believers are but brothers, so make settlement between your brothers. And fear Allah that you may receive mercy. Al-Hujurat (49:10)</td>
</tr>
<tr>
<td><img src="image5.png" alt="Image" /></td>
<td>The use of old building materials to reconstruct buildings</td>
<td>Recycling materials</td>
<td>Amanah (custodianship) in generations rights in nature and recourses</td>
<td>&quot;Indeed, we offered the Trust to the heavens and the earth and the mountains, and they declined to bear it and feared it; but man bear it.&quot; - Al-'Aţâzâb(33:72)</td>
</tr>
</tbody>
</table>
Example | Sustainable appearance | Sustainable issue | Islamic role & Built law | Related Qur’anic verses or prophetic hadiths
--- | --- | --- | --- | ---
| | Taking benefit of the space above allay without harm | Pragmatic design to accomplish benefit to man and society | Ilm Nafi’ (usefulness) and No-Harm principle | None of you truly believes until he loves for his brother what he loves for himself, said: The prophet
| | Diversity with Unity | The use of recourses variety to formulate harmony with context | Ilm Nafi’ (usefulness) without incongruity to culture | “… and We produce thereby fruits of varying colors? And in the mountains are tracts, white and red of varying shades and extremely black” Fāṭir (35:27)
| | The right of all individuals to get benefit of natural resources | Sustaining natural resources for all | Rahmah (Mercy) and the right of easement (Irtifak) | Who built a building above his need he will carry his building on his shoulder at the Day of Judgment

### Conclusions

The Islamic world has enriched human history with its scientific and artistic achievements, and contributed both within and outside of Islamic borders to the advent of the modern era. The field of Islamic Architecture is a key example of this rich legacy. This can be witnessed in the timeless and unprecedented buildings throughout Islamic civilization, among them.

The unity of Islamic architecture is related of course not only to the unity of cosmos and beyond that realm to the unity of the divine principle itself, but also to the unity of life of the individual and the community which the divine law makes possible. By refusing to distinguish between the sacred and profane, by integrating religion into all facets of life and life itself into the rhythm of rites and patterns of values determined by religion, Islam creates a wholeness, which is reflected in its architecture.

It was clear from the survey held in Mosul city which represents one of the cities established by Muslim architects and designers that there is a great awareness to issues of sustainability with their three pillars. That awareness is reflected in both macro and micro levels so that we can find this wise usage of resources in the space and fabric, in the material and construction, in the single building and its inner and constructed elements, and in the whole urban grains.

These sustainable pillars were also reflected sharply in the optimum collaboration between man and his environment, which is one of the most obligation in Islamic faith. It is also clear that by depending on Islamic principles (No- Harm, Mezan, Ilm Nafi’….etc.) architects created built environment with a high responsibility to the natural and local resources, without refuting the richness (saying diversity and variety) of such environment, and by using these local resources they also could save to the environment its health and strength. Given the way Islam looks at development, we can also seek Islamic solutions to global issues.
which threaten environment, so that we can keep our universe clean and healthy with enough resources to the future generations.

References


