ASTROLABE

RESEARCH ARTICLE

Islamic Perspectives: An Alternative to the Existing Model of Social Sustainability in Architecture

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ABSTRACT

In today's world, it has become evident that science and technology cannot solve every problem, but rather have produced many of their own. Their interaction with our environment has made it a victim, paving way to one of the greatest crises we have to deal with in this century. Overdependencies on natural resources for mass production technology have put a strain on them, leading to their depletion. There is a need to ensure that the challenges and responsibilities are shared among members of a community and equal opportunities are established globally in order to attain sustainable development. The identified principles of sustainability in Islam have been manifested throughout

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Islamic traditional architecture, and they have proven to be efficient in terms of comfort and standards. This research attempts to examine the defects in the current worldview of sustainability and presents the hypothesis that considering Islamic principles in the conventional model of sustainability may help to develop a more effective model, providing better results. This paper also narrows down its focus on the social component of sustainability through architectural practices and examines the pros and cons produced while incorporating Western practices into cultures that show strong adherence to traditions. It discusses maintaining the local tradition and techniques that are culture- and climate-appropriate for the region, as well as being environmentally friendly and economical, which are much sought-after factors in urban design in the current scenario of a global pandemic.

INTRODUCTION

Since the beginning of time, mankind has been consistently dependent on the natural environment surrounding human existence. For years, this relation has been complementary; however, irrational usage and over-exploitation of resources have eventually led to their depletion beyond repair, placing the future of our planet and coming generations at stake. The beginning of the 1960s marked a change in the way resources were being harnessed. It was Rachel Carson's *Silent Spring* (1962) that exposed the hazards of the chemical industry, questioning humanity's faith in technological progress, and helped set the stage for the environmental movement.[1] This sudden awakening came as a "reaction to the harmful consequences of the Modern Movement,"[2] which saw wasteful use of land and resources by applying inefficient and unhealthy construction practices and over-dependence on fossil-driven technologies. Consequently, attention was given to the harmful effects that construction practices had on our environment and "the awareness of holistic environmental thinking" was developed.[3]

The concept of sustainable development is considered to be "a response to the human need to balance environmental protection with social-economic development."[4] It started off as the "greening of architecture," aimed to transform modern architecture into an environmentally oriented approach. Later on, from the 1980s to the 2000s, "the notion of green was gradually replaced by sustainability" [5] and the concept evolved to how we know it today.

The realization of the immense pressure that humanity has placed upon the environment led world organizations to take up the cause, for example, the world summits organized by

1 NRDC, *The Story of Silent Spring*, August 13, 2015, https://www.nrdc.org/stories/story-silent-spring.

2 Phillip James Tabb and A. Senem Deviren, *The Greening of Architecture: A Critical History and Survey of Contemporary Sustainable Architecture and Urban Design* (Routledge, 2014), 2.

3 Tabb and Deviren, *The Greening of Architecture*, 1.

4 H. Aburounia and M. Sexton, "Islam and Sustainable Development," *Fraunhofer Information Center for Space and Construction IRB*, 2006, http://www.irbnet.de/daten/iconda/CIB9051.pdf. 757.

5 Tabb and Deviren, *The Greening of Architecture*, 19–22.

the United Nations in 1972 and 1983 in Stockholm, 1992 in Rio, 2002 in Johannesburg, and the recent conventions in 2015 and 2019 in New York. The goal was set to meet the needs of the present generation, without compromising the needs of coming generations. This concept of sustainability was grounded in the ethics of environmental responsibility; however, a construction industry "which puts sustainability at the heart of its operation" was lacking.[6] Such a mindset in the field hampered the application of sustainability principles and, for the same reasons, could not produce the desired effect.

SUSTAINABILITY: AN OVERVIEW

Historically, architecture has evolved as a response to the social and climatic conditions of various regions and cultures with different approaches. Globalization has brought about internationalization of architecture through modernism, which in turn has led to the eradication of cultural identity.[7] Although the movement unified the architectural language worldwide, it brought with it harmful consequences of pollution, land degradation, and exhaustion of natural resources. Consequently, there emerged the need to mitigate the negative effects of this aggressive pursuit of nature on the biosphere. Several architects of the 20th century took more environmentally oriented design approaches, when "they tended to integrate climatic design principles with modernist forms, technologies and materials."[8] However, treating the problem using the very practices that created them seemed futile.

By the late 20th century, serious concerns led to the creation of various organizations that took up the issue and proposed solutions to overcome it. A report by an international team of researchers at the Massachusetts Institute of Technology, titled *The Limits to Growth* (1972), concluded that "man can create a society in which he can live indefinitely on earth if he imposes limits on himself and his production of material goods to achieve a state of global equilibrium with population and production in carefully selected balance."[9] Yet another turning point in the development of international environmental politics was the United Nations Conference on the Human Environment (also known as the Stockholm Conference) that was convened under the UN in 1972. The modern concept of "sustainability" first appeared in the Brundtland Report, titled *Our Common Future*, published in 1987 by the United Nations, which stated that humanity does have the ability to make developments sustainable; the present state of technology and social organization can be "managed and improved to make way for a new era of economic growth" with international cooperation and political will.[10] The resolution adopted by the UN General

6 Brian Edwards, *Rough Guide to Sustainability* (Newcastle, UK: RIBA Enterprises, 2005), 4.

7 UK Essays, "Impact of Globalisation on Architecture", June 14, 2018. www.ukessays.com. https://www.ukessays.com/essays/architecture/impact-globalisation-architecture-7345.php?vref=1.

8 Tabb and Deviren, *The Greening of Architecture*, 6.

9 The Club Of Rome, *The Limits to Growth*, 1972, https://www.clubofrome.org/publication/the-limits-to-growth/.

10 World Commission on Environment and Development, "Our Common Future / The Brundtland Report", 1987.

Assembly in the 2005 World Summit defined the "three major components of sustainable development (Figure 1(a))—economic development, social development, and environmental protection—as interdependent and mutually reinforcing pillars."[11] Despite these guidelines and calls for a fresh start, transforming the world society and the world's economy to a sustainable basis appears to be the most significant challenge of our time.[12]

A FAULTY MODEL OF SUSTAINABILITY

Figure 1. The three pillars of sustainable development, from left to right, (a) the theory, (b) the reality, and (c) the change needed for a better balance (IUCN: The World Conservation Union 2006).

It was encouraging that the environment was finally considered on equal footing with the economy and social well-being; this was indeed a considerable improvement over what had been done in the past.[13] However, the model still placed humanity outside the environment, with no connectivity to the biosphere,[14] and failed to recognize our relevance as the major users or contributors to the ecosystem. The notion had thus evolved into a market-based economic model, with little to no consideration given to the environment as such (Figure 1(b)). By drawing on this concept, Dawe and Ryan argue in their article that "the environment is not and cannot be a leg of the sustainable development stool. It is the floor upon which the stool, or any sustainable development model, must stand."[15] Hence, the "three-pillared" model of sustainability was a flaw because it discounted the future and encouraged over-consumption.[16] The irony was that even when the 20th century was

11 UN General Assembly, *2005 World Summit Outcome* (New York: United Nations Organisation, 2005).
12 Michael Ben-Eli, "Sustainability: Definition and Five Core Principles,", The Sustainability Laboratory, 2015, http://www.sustainabilitylabs.org/assets/img/SL5CorePrinciples.pdf.
13 Neil K Dawe and Kenneth L Ryan, "The Faulty Three-Legged-Stool Model", *Conservation Biology* 17, no. 5 (2003): 1458–60.
14 Herman E Daly, *Beyond Growth: The Economics of Sustainable Development*, New Edition (Beacon Press, 1997).
15 Dawe and Ryan, "The Faulty Three-Legged-Stool Model," 1458–60.
16 Odeh Rashed Al-Jayyousi, *Rethinking Sustainability: Islamic Perspectives*, July 3, 2015, https://www.ecomena.org/sustainability-islamic-perspectives/.

heralded as the era of sustainability, "the evidence is that the global human enterprise is rapidly becoming less sustainable and not more."[17]

Jane Jacobs, in her best known and influential work *The Death and Life of Great American Cities* (1961), reckons that cities of the postmodern world were an antithesis to nature, which was limited to the notion of grass, fresh air, and little else. In addition, she states that the social behavior of people was affected by city planning, which in turn affected the economic behavior of the cities.[18] Many projects intended to be sustainable ended up in failure as the components of the sustainable model were not considered effectively by planners. We see this in the case of the Pruitt-Igoe housing projects, one of America's most notorious housing projects, as it failed to meet the expectations of planners and authorities as a solution for the urban poor in the city. It deteriorated into a crime-ridden infamous slum and was eventually imploded with dynamite in 1972 (Figure 2).[19]

Figure 2. America's most ambitious housing project Pruitt-Igoe came down in ruins in 1972 after crime and filthy conditions led to its demolition. Source: US Department of Housing and Urban Development.

It is here that we need to scrutinize the connection between the three major components of sustainable development, and that it is impossible to consider them separately as economic developments cannot be separated from environmental issues, that in turn are connected to the social component of development. Considering poverty as an example,

17 IUCN: The World Conservation Union, "The Future of Sustainability: Re-thinking Environment and Development in the Twenty-first Century," January 29–31, 2006, www.iucn.org. http://cmsdata.iucn.org/downloads/iucn_future_of_sustanability.pdf.

18 Jane Jacobs, *The Death and Life of Great American Cities* (New York: Random House, 1961).

19 Hannah Frishberg., *The Failed Paradise: Pruitt-Igoe*, November 26, 2013, https://www.atlasobscura.com/articles/pruitt-igoe.

we see that it is a cause and effect of global environmental problems, and it is a factor that affects the economic indices of countries. Hence, the global economy and the global ecology have now become more interwoven/interlinked locally, nationally, and globally in this net of cause and effect.[20] The United Nations has thus formulated 17 practical challenges to solve in the near future (Figure 3), which revolve around the environmental, social, and economic components of sustainability.

Figure 3. The UN's Sustainable Development Goals include challenges related to environmental, social, and economic components of sustainability. Source: Open source by the UN.

ISLAMIC PRINCIPLES AND SUSTAINABILITY

Previous research has established that religion significantly relates to the performance of sustainable behaviors, encouraging such approaches and providing an insight into a more holistic view of sustainability.[21] While considering the role of religious consciousness in the formation of sustainable attitudes, the vantage point of Islam deserves as much consideration as any other; the present ecological crisis has indeed made Islam a particularly relevant ethical tradition.[22] The concept of sustainability is not new to Islam as "sustainable development principles have existed for centuries in the Holy Qur'an and the Hadith."[23] The Holy Qur'an and Hadith have established a framework for mankind on how to interact with their surroundings—the environment—and are encouraged to maintain the balance in

20 World Commission on Environment and Development, "The Brundtland Report."

21 Elizabeth A Minton, Lynn R Kahle, and Chung-Hyun Kim, "Religion and Motives for Sustainable Behaviors: A Cross Cultural Comparison and Contrast," *Journal of Business Research* 68, no. 9 (2015).

22 S. Parvez Manzoor, "Environment and values: the Islamic perspective," in *The Touch of Midas: Science, Values, and Environment in Islam and the West*, ed. Ziauddin Sardar (Manchester: Manchester University Press, 1984), 150–69.

23 Aburounia, and Sexton, "Islam and Sustainable Development," 757.

the universe that God has established since the beginning of creation. This shows that the "concept of sustainable development took root in 7th century Islam ideology, however, it was not until 20th century that this was translated into a modern context."[24]

As mentioned previously, the concept of sustainability developed in the past half-a-century considers "the environment, social well-being, and economy as the legs sustainable development stands upon… and are of equal importance."[25] Sustainable development is defined in Islam as the balanced and simultaneous realization of consumer welfare, economic efficiency, and attainment of social justice, with importance given to the ecological balance (Figure 1(c)) in the framework of an evolutionary knowledge-based, socially interactive model defining the Shuratic process of decision-making.[26] Many intellectuals have now formulated certain basic principles with regard to environmental thinking in Islam.[27] This was done in the light of the fundamental values of Islam as identified in the "Knowledge and Values" seminar held in Stockholm in September 1981.[28] The following section provides an insight into the foundational ideas for such a realization of sustainable development principles from an Islamic perspective.

Man as the Representative of God (Khalifa)

The primary principle of Islam, the basis for the very existence of humanity, is the purpose for which mankind was created. Infusing the natural world with transcendental (revealed) ethics is the main purpose of man according to the Qur'an.[29] He was appointed as a representative of the Divine upon earth, as seen from the following verse:

> And when your Lord said to the angels: "Indeed! I am about to place a vicegerent (*khalifa*) on earth." (Holy Qur'an 2:30)

This role was conferred with a certain intention, with the raison d'être being to "enjoin what is right, and forbid what is wrong" (Holy Qur'an 3:104-110; 9: 71,112; 31:17). Therefore, failure to abide by this principle will in turn bring about calamities and destruction (*fasad*) for man himself, which can be observed from the present world scenario as stated in the verse:

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24 Aburounia and Sexton"Islam and Sustainable Development", 763.

25 Dawe and Ryan, "*The Faulty Three-Legged-Stool Model*," 1458–60,

26 Iyad Abumoghli, *Islamic Principles on Sustainable Development*, August 23, 2019, https://www.ecomena.org/islam-sustainable-development/.

27 Ziauddin Sardar, *The Touch of Midas: Science, Values, and Environment in Islam and the West* (Manchester: Manchester University Press, 1984); S. Gulzar Haider, "Habitat and Values in Islam: A Conceptual Formulation of an Islamic city," *Touch of Midas* (Manchester: Manchester University Press, 1984), 170–208; Sayed Sikandar Shah Haneef, "Principles of Environmental Law in Islam," *Arab Law Quarterly* (2002): 241–54; Spahic Omer. "A Conceptual Framework for Sustainability in Islamic Architecture: The Significance of the Concepts of Man and the Environment," *Journal of Islamic Thought and Civilization* 5, no. 2 (2015): 49–74.

28 Manzoor, "Environment and values: the Islamic perspective,".

29 Manzoor, "Environment and values: the Islamic perspective".

> Mischief (*fasad*) has appeared on land and sea because of (the deed) that the hands of men have earned (Holy Qur'an 30:41)

This reckons that environmental problems such as global warming, devastating floods, and scorching droughts are all consequences of man's irresponsible handling of earth and its resources—a dereliction to recognize his role as the *khalifa*. The principles for sustainability in Islam, thus derived from this very concept—which is the missing aspect of the conventional model—can be stated as follows.

Custodianship of Earth's Assets (Amanah)

The role of representative (*khalifa*) has come with certain responsibilities—a role that mankind has volunteered to accept (Holy Qur'an 33:72). It is therefore of utmost importance to keep in mind this trusteeship (*amanah*) while interacting with the environment, and to make sure the resources are used in a sustainable manner, in order to ensure that the relationship is symbiotic. The problems we face with our environment today are due to the absence of this custodianship, due to which man is not held accountable for his actions.

Intrinsic State of Purity (Fitrah)

Everything that has been created in nature is for the benefit of mankind. This dependency should, however, be in accordance with the order fixed by the Creator himself.[30] It is essential to use the elements of the environment in their natural state without any corruption to imply full harmony with nature, people, and the built environment. The building materials and construction practices today are heavily dependent on fossil fuel energy and its byproducts, having negative impacts on health.[31] The lack of ventilation, lighting, and materials in their natural (*fitrah*) form have led to ecological degradation.

Pre-Existing Order of the Universe (Mizan)

The universe was created, carefully measured, and balanced; the divine command is not to tamper with it after it has been set in order (Holy Qur'an 7:85; 55:7–8). Any attempt to disrupt this balance will prove to be catastrophic. Human greed to maximize profit and attain economic growth has ravaged the environment beyond recognition.[32] The key to maintaining this balance (*mizan*) is put forth as a divine law: "Do not commit excess" (Holy Qur'an 6:141; 7:31). Any deviation from this command to abstain from extravagance (*ithraf*) may badly disturb the harmonious relationship between man and nature and result in unspeakable ecological crises and its ensuing disasters.[33]

Path of Moderation (Wasat)

The Islamic nation has been addressed as the "median community" (*ummatan wasat*) in the Holy Qur'an (2:143) —a nation that avoids excess in all circumstances. Utilization of

30 Haneef, "Principles of Environmental Law in Islam".
31 Tabb and Deviren, *The Greening of Architecture*, 14.
32 Haneef, "Principles of Environmental Law in Islam".
33 Haneef, "Principles of Environmental Law in Islam".

resources needs to be done considerately and moderately, benefiting from it and simultaneously passing it on to the next generation in an excellent condition.[34] This neutral approach (*wasat*) symbolizes the responsibility (*amanah)* that needs to be implemented by the *khalifa.*

Economic and Social Justice ('Adl)

All of nature's resources are considered to be the right and joint property of the entire mankind; taking precautions to safeguard the interests and rights of others, including the coming generations, is a responsibility of every human (*khalifa*).[35] In modern times, indigenous people have been deprived of their rights (*'adl*), and their resources are substituted according to the needs defined by the West in the name of sustainability.[36] The deliverance of justice (*'adl*) is not limited to humans alone but should encompass every living creature and natural resource—abusing any of these is considered a sin.

Perfection in Actions (Ihsan)

It has been observed previously that man should not be delinquent while manipulating nature for his benefit. The principle of perfection/goodness (*ihsan)* is embedded in the idea that man's handling of nature should be mutually beneficial. All of man's relationships in Islam are based on *ihsan* and not on material or economic gain, as emphasized in the verse "God enjoins justice and kindness" (Holy Qur'an 16:90).[37] Developments should not be done meaninglessly and without necessity, which would contribute to overindulgence and wastage of resources. The Holy Qur'an (28:77) encourages mankind to "Do good, as God has done good to you," and not to harm the environment in the process of benefiting from it.

APPLICATION OF ISLAMIC PRINCIPLES

Throughout history, the Arab/Islamic world has contributed to the advancement of societies even while strongly adhering to religious values. We observe examples since the time of Prophet Muhammad who implemented the above principles and manifested the role of divine representation (*khalifa*), followed by the Caliphs of Islam. The overarching principle while dealing with nature is derived from the prophetic declaration: "There shall be no damage and no infliction of damage,"[38] which reflects the principles of neutrality (*wasat*) and balance (*mizan*). He believed that not only humans, but also animals, forests, and watercourses have rights (*'adl*) reserved under the divine law. For this reason, he established "*hima*" and "*haram*" zones (wildlife and natural resource protection zones

34 Abumoghli, "Islamic Principles on Sustainable Development".
35 Abumoghli, "Islamic Principles on Sustainable Development".
36 Al-Jayyousi, *Rethinking Sustainability: Islamic Perspectives*.
37 Kamaruzaman Jusoff and Siti Akmar Abu Samah, "Environmental Sustainability: What Islam Propagates," *World Applied Sciences Journal* 12 (Special Issue on Creating a Knowledge Based Society) (2011): 46–53.
38 Abumoghli, "Islamic Principles on Sustainable Development".

under the rules of Islam, i.e., the *Shariah*) as the public property or common lands managed and protected by the public authority for conservation of natural resources.[39] Such demarcation thus became a symbol of social equity, redress, justice, and an instrument of environmental conservation.[40] Many hadiths of the Prophet refer to protecting the environment and keeping it clean and fruitful (*fitrah*), and encourage afforestation and land reclamation for the productive use of the environment (*ihsan*).[41] Even though this might strike many as strange, we could say that the Prophet was an "environmentalist avant la lettre," who pioneered the implementation of conservation, sustainable development, and resource management,[42] which established the principle of custodianship (*amanah*). The strategies devised by Prophet Muhammad—like the concept of *hima* and *haram*—became a way of life in Islamic societies; it was passed from generation to generation, practiced almost unconsciously, and allowed the people of this region to survive the centuries before being overwhelmed with modern tools and technology.[43] This was a testimony to the society's understanding of its limited resources and a manifestation of how to use the available resources sustainably to build resilient systems that will help it overcome the harshness of its environment.

In accordance with earlier observations, there is a need to rethink the Western model for sustainability in a way that it guarantees a humanistic and sustainable framework. It needs to resonate with culture, ensuring balance (*mizan*) and social equity (*adl*), and respecting harmony between nature, people, and markets.[44] This reflects the Islamic perspective in which "conserving the human, social and natural capitals are considered as necessities."[45] It is encouraging to compare this notion with that found in a secular study which concludes that "religion significantly relates to performance of sustainable behaviors… maximizes the effectiveness of campaigns encouraging sustainable behaviors."[46]

In the modern context, many examples of traditional Islamic architecture are found in the 20th century, which provides an opportunity to analyze the effectiveness of the above-mentioned principles. The philosophical approach of the renowned Egyptian architect Hassan Fathy, who pioneered the use of appropriate technology in the Arab/Islamic world, is embedded in these principles. Fathy, being a contemporary of the Modern Movement, was disillusioned by it; he felt that the social and climate-oriented architecture and planning was missing in this context.[47] In the following sections, we examine Fathy's

39 Abumoghli, "Islamic Principles on Sustainable Development".
40 Hala Kilani, Assaad Serhal, and Othman Llewlyn, *Al-Hima: A Way of Life* (Beirut: IUCN West Asia regional Office, Amman Jordan; SPNL Beirut, Lebanon, 2007), 8.
41 Jusoff and Samah, "Environmental Sustainability".
42 Jusoff and Samah, "Environmental Sustainability".
43 Serhal Kilani and Llewlyn, *Al-Hima: A Way of Life*, 5.
44 Al-Jayyousi, *Rethinking Sustainability: Islamic Perspectives*.
45 Al-Jayyousi, *Rethinking Sustainability: Islamic Perspectives*.
46 Minton, Kahle, and Kim, "Religion and Motives for Sustainable Behaviors", 7.
47 Tabb and Deviren, *The Greening of Architecture*, 7.

philosophy depicting the aforementioned Islamic principles and their demonstration through the elements of traditional Islamic architecture.

Case Study: Architectural Philosophies of Hassan Fathy

In this section, we inspect the philosophies put forward by the Egyptian architect and master builder, Hassan Fathy (1900–1989)—one of the first architects to break with the modern architecture and who took efforts to revive and create a new architectural practice that connected with the essence of an Islamic architectural tradition. During his professional career, which began in 1926, Fathy stayed close to the Nubian tradition, using mud brick, which was its characteristic building material, and Pharaonic architectonic elements such as unsupported arches and vaults, while upholding the traditional values of Islam and demonstrating coherence between structural and sociological needs.[48] The architecture of Islam is dictated by the instructions of the religion of Islam; its productions differ from region to region depending on traditions, habits, climate, and vernacular forms.[49]

Fathy was not enamored by modern forms and criticized their total disregard for human needs and social values and the destruction of long-established cultural patterns that modernism encouraged.[50] He acknowledged that man was answerable to the dictates of the environment and was able to identify and give meaning to this critical connection through an appropriate design in response to natural forces and human needs, which he saw as a key factor in the different architectural expressions of various cultures.[51] In this manner, he acknowledged the environmental factor of sustainability in his philosophy.

The underlying organizational principle of Fathy's plan was balancing the needs of the Islamic social system, with its clear separation of private life, as reflected in the traditional roles of men and women—the public space was designed for men, the private space for women, the family, and the livestock, and the semi-public space linked the two.[52] He reasoned that "cooperative building system can only work if a man's work can be recorded as a loan to society and repaid in the form of a building."[53] He also introduced a scheme of in-service training for trainees "to pay for their training by giving their newly acquired skill to the community at a lower rate than the normal."[54] By doing so, he was able to address social and economic issues, by giving rights to the local/indigenous groups to earn for themselves.

48 Hana Taragan, "Architecture in Fact and Fiction: The Case of the New Gourna Village in Upper Egypt," Necipoglu, Gulru, *Muqarnas Volume XVI: An Annual on the Visual Culture of the Islamic World* (Koninklijke Brill NV, 1999), 169–78.

49 Abdel-moniem M. El-shorbagy, "The Architecture of Hassan Fathy: Between Western and Non-Western Perspectives," University of Canterbury Research Repository, 2001, https://ir.canterbury.ac.nz/handle/10092/7557.

50 James Steele. "A Tribute to Hassan Fathy," *Architecture for a Changing World* (1992): 50–52.

51 Steele, "A Tribute to Hassan Fathy".

52 Taragan, "Architecture in Fact and Fiction".

53 Hassan Fathy, *Architecture for the Poor: An Experiment in Rural Egypt* (University of Chicago Press, 1976), 123.

54 Fathy, *Architecture for the Poor*.

Fathy believed that an architect puts his building in two environments, the God-made and the man-made, and that he needs to respect both of them.[55] He manifested this through the use of local materials and also incorporated elements responsive to the climate of the area, including the courtyard, the *qa'ah*, the *malqaf*, the *takhtabush*, and the *mashrabiyyah*.[56] Fathy held the view that architecture must be indigenous to the region and its people, as each has its own specific materials, climate, culture, and traditions. From his literary works, we see that his ideas revolve around three main core principles—man as the center of the architecture, man as a part of nature, and consequently man embedded in nature's universal laws.[57]

One notable project by Fathy is the Islamic center for the Dar Al Islam Foundation (Figure 4) in New Mexico in 1980. Though the context is not in the Arab/Islamic world, it was chosen because the landscape would be similar to those of many Muslim lands and because of the existing tradition of building with adobe.[58] It should also be noted that Fathy brought along a team of Nubian masons, who came to the USA specifically for the purpose of training the local community members in low-technology building techniques of vault and dome construction used in Upper Egypt.[59] Steele, in his catalogue of Hassan Fathy's work, justifies the choice of architecture: "While the architectural style chosen for the village may seem foreign in this Western context, it does have much in common with the local, adobe tradition. Judging from both the technical and economic complexities involved in using adobe here, however, it would seem that the intentional choice of this material and style was made for iconographic, rather than environmental or cultural reasons."

Figure 4. The Dar Al Islam Islamic Center in New Mexico designed by Hassan Fathy is a notable example in terms of sustainability. Source: Daralislam.org.

55 Steele, "A Tribute to Hassan Fathy".

56 El-shorbagy, "The Architecture of Hassan Fathy" .

57 Darl Rastorfer, *The Man and His Work: In Hassan Fathy*, (Concept Media / Aga Khan Trust for Culture, 1985).

58 Archnet, *Dar al-Islam, Abiquiu, United States*, December 15, 2020, https://archnet.org/sites/201.

59 James Steele *The Hassan Fathy Collection. A Catalogue of Visual Documents at The Aga Khan Award for Architecture* (Bern, Switzerland: The Aga Khan Trust for Culture, 1989).

Through interviews conducted to attest the discrepancies in the conventional model and the need to revive sustainable philosophies similar to that of Hassan Fathy, the opinions of academics and professionals related to the field were collected. It was confirmed that Fathy chose to build economically simple structures using local materials that were climate-oriented and influenced by the Nubian and Coptic architecture.[60] Swelim comments that he intended to adopt the vernacular architecture into a modern context as it deemed to be successful in the past, thereby upholding the traditional values of Islam and creating a new practice that identified with the essence of an Islamic architectural tradition. However, his strength and relevance were in relation to his philosophies rather than his buildings.[61]

With the threat of global climate change and resource depletion, there is a need to switch to traditional energy-efficient methods indigenous to a specific region.[62] Naseef states that Fathy tried to revive certain skills that were being lost to the local population with the advent of modern technologies; the trend of modernism hijacked the cost-effective techniques that were already at the disposal of the local labourers/craftsmen. Despite the fact whether he built for the elite or the poor, it has become an increasingly inevitable challenge to revive philosophies similar to that of Hassan Fathy in the current world scenario.[63] Although Fathy attempted to provide a foundation for sustainable practices in the architecture of the region, he did not sow the seeds of the social process that would have enabled it to be further developed through new vernaculars;[64] many of his projects were not deemed to be successful. Nevertheless, his concepts and philosophy still hold relevance to the concept of sustainability.

FATHY'S PHILOSOPHY IN LIGHT OF ISLAMIC PRINCIPLES

In this section, we compare the quotes from Hassan Fathy that portray his philosophy, in order to find which aforementioned principles related to sustainability in Islam they depict and to verify their practicality in traditional Islamic architecture with examples as indicated in Table 1.

60 Dr. Tarek Swelim, *An Interview with Dr. Tarek M. Swelim*, Interviewed by Sameeha Abdussamad, December 10, 2019; Ar. Hassan Naseef, *An Interview with Ar Hassan Naseef,* Interviewed by Sameeha Abdussamad. December 13, 2019.

61 Swelim, *An Interview with Dr. Tarek M. Swelim.*

62 Naseef, *An Interview with Ar Hassan Naseef.*

63 Naseef, *An Interview with Ar Hassan Naseef.*

64 Malcolm Miles, "Utopias of Mud? Hassan Fathy and Alternative Modernisms," *Space and Culture* 9, no. 2 (2006): 116–39.

Table 1. Comparison of the architectural philosophy of Hassan Fathy with principles of sustainability in Islamic traditions and its manifestation through examples.

Philosophy of Hassan Fathy	Islamic Principles Depicted	Examples from Islamic Architecture
Attitude towards Architecture "The architect puts his building in two environments; the one is God made i.e. the landscape…… the other is man-made; the urban. If he does not respect the first, it would be a sin … and if the architect did not respect the other, it would be lack of civility towards the fathers."[65] "He (architect) is introducing a new element into an environment that has existed in equilibrium for a very long time… if he shirks this responsibility and does violence to the environment by building without reference to it, he is committing a crime against architecture and civilization."[66]	Custodianship (*Amanah*) Balance (*Mizan*) Purity (*Fitra*)	 The ancient mud city of Shibem in Yemen merged into its natural surroundings; its architecture was influenced by the local context (i.e., natural and cultural environments). The building materials are natural—clay, reed plants, or stone walls—with zero-carbon emissions, and can be recycled and used. The spatial organization of residential and commercial areas fulfill both social and climate needs.[67] Source: National Geographic

65 El-shorbagy, "The Architecture of Hassan Fathy".

66 Hassan Fathy, *Natural Energy and Vernacular Architecture: Principles and Examples*, With *Reference to Hot Arid Climates*. Ed. Abd al-rahmān Sultān and Walter Shearer (University of Chicago Press, 1986), https://archive.unu.edu/unupress/unupbooks/80a01e/80A01E00.htm#Contents.

67 Ahmed S Attia, ""Traditional multi-story house (Tower House) in Sana'a City, Yemen: An example of sustainable architecture," Alexandria Engineering J*ournal* 59, no. 1 (2020): 381–87.

"Willfully to break a tradition in a basically traditional society like a peasant one is a kind of cultural murder, and the architect must respect the tradition he is invading."[68]		 Traditional designs take advantage of the climatic conditions and local materials, avoiding the usage of materials and techniques foreign to the region with negative consequences. Source: Tripadvisor
Maintaining Cultural Identity "An architect is in a unique position to revive people's faith in their own culture. If, as an authoritative critic, he shows what is admirable in local forms, and even goes so far as to use them himself, then the people at once begin to look on their own products with pride."[69] "Client, architect, and craftsman, each in his province, must make decisions, and if any one of them abdicates his responsibility, the design will suffer and the role of architecture in the cultural growth and development of the whole people will be diminished."[70]	Custodianship (*Amanah*) Social/economic justice (*'Adl*) Moderation (*Wasat*)	 Using local labor provided the natives their right to earn and retain their cultural identity in architecture. In his projects, Fathy resorted to local recruitment, often employing a group of trained masons to impart the skills to the local masons in special building techniques. Source: Archnet.org

68 Fathy, *Architecture for the Poo*r, 25.
69 Fathy, *Architecture for the Poor*, 43.
70 Fathy, *Architecture for the Poor*, 40.

Choice of Materials "Man should be careful not to disturb the natural electro-magnetic balance by improperly selecting the material he uses …. Great care must be taken in the choice of the wall and roof materials and their thicknesses with respect to their physical properties, such as thermal conductivity, resistivity and transmission, and optical reflectivity."[71]	Balance (*Mizan*) Moderation (*Wasat*) Purity (*Fitra*) Perfection (*Ihsan*)	 A mud-brick house in South Morocco. Materials that are alien to the surrounding would disturb the urban fabric and the natural setting. Source: Pinterest
Preserving Local Skills "Machine-made products are identical, impersonal, and unrewarding … Handmade products appeal to us because they express the mood of the craftsman. Each irregularity, oddity, difference … witness to the constant living interaction of the man with his material."[72] "I wanted to teach the Gournis brick making, quarrying, brick and lime firing, bricklaying, plumbing, and plastering…I wanted to preserve and perhaps modify traditional designs of furniture that would suit the houses."[73]	Social/economic justice (*'Adl*) Moderation (*Wasat*) Goodness (*Ihsan*)	 A machine product is not always connected to people or its surroundings. Handmade products provide livelihood for the local labor force, reducing time and cost with regard to transportation while maintaining originality and uniqueness. Source: Flickr With all the developments taking place around the world, teaching the locals new skills to upgrade their techniques and to make them more efficient can also be categorized as sustainable; for example, rammed earth constructions.

71 Fathy, *Natural Energy and Vernacular Architecture*.
72 Fathy, *Architecture for the Poor*, 27.
73 Fathy, Archit*ecture for the Poor*, 61.

Climate-Oriented Architecture "The climate of the locality and the buildings around it mold the building, so that… it owes much of its shape to these factors… Climate, in particular, produces certain easily observed effects on architectural forms."[74] "Wooden or marble lattices fill large openings to subdue the glare of the sun while permitting the breeze to pass through. Such arrangements characterize the architecture of hot zones, and evoke comfort as well as aesthetic satisfaction with the visible endeavors of man to protect himself against the excessive heat."[75] "Beauty comes out when the form considers the force acting on it. Architectural form should consider the forces in nature of wind, rain, even how an earthquake shaking it would make it fall in a pattern that follows the geological formation of a mountain."[76] "Fathy used the word *sakina* to describe the quality he sought in the courtyards. The word *sakina* comes from the word *sakan*, which is the Arabic name for a house and relates to peace and purity."[77]	Purity (*Fitra*) Moderation (*Wasat*) Perfection (*Ihsan*) Balance (*Mizan*)	 Elements of Islamic traditional architecture, such as *sahn* (courtyard), *takhtabush* (a modification of the courtyard), and *malqaf* (wind catcher), harness the climatic conditions to provide architectural and thermal comfort, fulfilling the purpose of aesthetics and function. Source: Archnet.org  *Mashrabiya* used for thermal comfort, privacy, and regulating heat inside the building. Source: Autodesk  *Badgir*, a specific type of *malqaf* (windcatcher), for the purpose of ventilation makes use of air movement through the building. Source: Tasteiran.net

74 Fathy, *Natural Energy and Vernacular Architecture*.
75 Fathy, *Natural Energy and Vernacular Architecture*.
76 Rastorfer, *The Man and His Work: In Hassan Fathy*.
77 El-shorbagy, "The Architecture of Hassan Fathy"".

Urban Planning Considerations "As climate is a dominant factor in traditional town planning… uniformity in urbanization is found in all hot arid zones. The layouts of almost all traditional cities in the area are characterized by two features: narrow winding streets, and large open courtyards and internal gardens."[78] "Typically, large courtyards serving as reservoirs of cool, fresh air dominate a city plan… With regard to a gridiron town plan, buildings crowded in the city center affect wind movement in that quarter, creating eddies and lowering the wind velocity by friction and change of direction… if the architect must adopt a gridiron street pattern with wide avenues, then sufficient green areas should be spread over the geographical area in order to redistribute the heat evenly within the city and avoid its concentration in the center."[79]	Balance (*Mizan*) Moderation (*Wasat*) Perfection (*Ihsan*)	 Part of the town plan of the city of Damascus showing open courtyards (unmarked) within the urban fabric. Courtyards act as reservoirs of cool, fresh air and avoid crowding and urban sprawl. Source: Fathy 1986

SOCIAL COMPONENT OF SUSTAINABILITY IN ARCHITECTURE

Human resources are a valuable asset of sustainable development; however, a rapid growing population increases pressure on resources and poses a problem when the available resources in relation to population growth turns out to be insufficient. Hence, there is a need to adopt techniques to improve human potential to manage these resources in a manner less harmful for the environment.

78 Fathy, *Natural Energy and Vernacular Architecture*.
79 Fathy, *Natural Energy and Vernacular Architecture*.

Social sustainability implies that development should meet the basic necessities of all and provide equal opportunities for all the sections of a society to fulfill the requirements to attain a better quality life. It is addressed in terms of three factors by social scientists:[80]

1. Meeting the basic needs and addressing underdevelopment;
2. Changing attitudes towards the environment by promoting stronger environmental ethics;
3. Maintaining or preserving preferred ways of living or protecting particular socio-cultural traditions.

Over the years, societies have defined their environments, environmental challenges, and potential solutions depending on their culture; these solutions have unintended consequences, and in turn cause challenges and ask for solutions, repeating the cycle again.[81] While in the case of most societies the traditional practices are closely linked with nature, the Western cultural tradition defines nature as distinct from culture.[82] The incorporation of Western practices into cultures that show strong adherence to traditions highlights the difficulty of transferring building practices between polar-opposite cultures. It results in a system that caters to the requirements of the cream of the society and ignores the deprived, which gives rise to unacceptable modes of development. In the following section, we look into how the introduction of contemporary Western values to Islamic city designs have created drastic changes in its societal structure and altered traditions.

CONTEMPORARY VALUES IN ISLAMIC CITIES

In a society, generally, values are continuously reinforced and maintained by the predominant religion or ideological system.[83] Traditional towns of Muslim nations were built according to the principles derived from the Sharia'a (Islamic law). This had a major influence on the urban development of the pre-industrial Muslim world. We see that it governed the values of Islamic societies by putting forward general principles, such as the importance of family and supporting offspring, setting enough privacy for family life, encouraging a healthy lifestyle for mental and physical well-being, and avoiding squander and extravagance. From these principles emerged regulations for social interaction (*mu'amalat*) and a powerful framework for determining correct and acceptable decisions in building activities. It took into account elements such as building heights and proximity of houses, introverted houses with courtyards and interior gardens, as well as the design of public spaces with respect to residential units.

80 Suzanne Vallance, Harvey C. Perkins, and Jennifer E. Dixon, "What is Social Sustainability? A Clarification of Concepts." *Geoforum* 42 (2011): 342–48.

81 Sander Van Der Leeuw, *Social Sustainability, Past and Future: Undoing Unintended Consequences for the Earth's Survival* (Cambridge: Cambridge University Press, 2020), 10.

82 Leeuw, *Social Sustainability, Past and Future*, 10.

83 Besim S. Hakim and Peter G. Rowe. "The Representation of Values in Traditional and Contemporary Islamic Cities," *Journal of Architectural Education* 36, no. 4 (1983): 22–28.

In his comment on the article "Simultaneous Perplexity: The Paradise Garden as the Quintessential Visual Paradigm of Islamic Architecture and Beyond" (2013) by Nader Ardalan, Mohammed Arkoun states that the concept of a garden in the Muslim world is a cultural sign that activates "the awareness of the delicate beauty of this temporal world and the need for the preservation of this fragile planet."[84]

This outlook towards nature was also visible in domestic architecture through climate-responsive design approaches such as wind screens (*mashrabiya*), the wind tower (*malqaf*), reception halls with fountains (*qa'a*), and most importantly the courtyard (*sahn*). The use of natural forces within the built environment through these architectural elements, along with the reuse of resources, emphasized the ties between the built and natural environment of Islamic societies. The use of locally available material is highlighted by the Muslim world through its historical buildings where the materials vary from mud to bricks to a variety of stones based on the geographical context. This was economical in terms of availability and transport, and it supported local industries and craftsmen.

From all of the above influences, Islamic urbanization exhibited certain characteristics, which can be summarized as follows:[85]

1. High-density, low-rise development;
2. Introvert concept on both the urban and building scales, providing privacy, climatic advantages, and positive urban spaces;
3. High coverage of land with buildings;
4. A continuous urban fabric, irregular in shape and form, with identity and originality.

Many traditional cities of the Muslim world reflect their cultural identity in their built environment even today. Among these cities, Fez in Morocco is known to have the best preserved old city in the Arab world, which stands out as the world's largest urban area with no car traffic.[86] Even during the colonial period, due to the topography of the traditional city, the new colonial city was located 2 kilometers west of the ancient city, allowing the traditional medina to develop independently and operate in its traditional manner.[87] The separation between the public and private domains, and the interaction between the public space and the volumetric articulation of space—which are the basic Islamic structuring principles—are rigorously maintained in the city of Fez.[88] The urban fabric of the city clearly reflects the concept of social solidarity in which religious beliefs

84 Nader Ardalan, "Simultaneous Perplexity": The Paradise Garden as the Quintessential Visual Paradigm of Islamic Architecture and Beyond," in *Understanding Islamic Architecture*, ed. Attilo Petruccioli and Khalil K. Pirani (London: Routledge, 2013), 9–18.

85 Ahmed Farid Moustapha, *Islamic Values in Contemporary Urbanism* (Melbourne: ISOMER (Islamic Society of Melbourne Eastern Region), 1986).

86 Huyam Abudib, "Exploring Contextual Characteristics of Traditional Medinas in North Africa." *International Journal of Architectural Research* 10, no. 1 (2016): 325–43.

87 Abudib, "Exploring Contextual Characteristics".

88 Jonathan G Katz, "Fez: The Ideal and the Reality of the Islamic City," *Architecture as Symbol and Self-Identity* (Philadelphia: Aga Khan Award for Architecture, 1980), 74–77.

and values, especially those relating to organization and authority, encourage social interaction and discourage dispersal.[89]

In the post-colonial Islamic world, Muslim societies were torn between the images of the society created by the Prophet Mohammad in Medina and the reality of the Western present.[90] With the acceptance of Western models into these cities in the early 20th century, modernity started to overpower the existing architectural practices, disregarding the inherited sociocultural values of the region. Rapid urban transformation made people demonstrate disaffection and lower sense of belonging to the cities of the Middle East in the 1960s and 1970s.[91] There arose a need to revive the architectural heritage and re-establish the relationship with principles, which facilitated the organic growth and incorporated nature into the built elements like in the traditional urban setting.

With the development of contemporary urban settlements within Islamic cities, there has been a blatant departure from traditional practices. The urban fabric in these cases is unnaturally regular with grid patterns as they are designed to accommodate transportation systems. The physical independence of housing units departs from the usual conventions of traditional building and is reinforced by the building regulation rules that deny the formation of connected forms of housing; consequently, the advantages of shading and building for climate control can be lost, and the streetscape—even after showcasing traditional elements of Islamic architecture—loses both vitality and visual interest.[92] Such drawbacks were exhibited in the "Crash Housing" in Dammam, Al Khobar (Figure 5), which followed Western conventions in internal organization, distinct from the traditional patterns of settlements. The lack of appropriate orientation and use of building forms for climate control resulted in excessive consumption of energy and uneconomical costs of utilities. Professor Egbert Kossak, former Head of the Department of Planning at Stuttgart University, commented that if the Muslim world continued to plan cities according to modern conventions, they would lose the religion as a whole because the development patterns would completely depart from the traditional physical forms, which would destroy the original social values.[93]

89 Rabah Saoud, "Introduction to the Islamic City," MuslimHeritage.com (FSTC Limited, August 2002), https://muslimheritage.com/uploads/Islamic%20City.pdf.

90 Haider, "Habitat and Values in Islam".

91 Mohammad Saeed Al-Shehhi, "The Evolution of Regional Design Practices: How the Arab World's Design Past Informs Its Future," Commercial Interior Design, September 27, 2017, https://www.commercialinteriordesign.com/voices/the-evolution-of-regional-design-practices-how-the-arab-worlds-design-past-informs-its-future?amp.

92 Hakim and Rowe, "The Representation of Values".

93 Moustapha, *Islamic Values in Contemporary Urbanism*.

Figure 5. A block plan of the "Crash Housing" in Al Khobar. Source: Hakim and Rowe 1983.

All these factors in turn affected social relations and interactions between members of a society, which reduced the sense of responsibility and mutual cooperation in a social organization that further withered due to the centralization of governance. Modernization also severely impacted the urban form, creating a social rift between various economic classes and perpetuating a feeling of backwardness and lower social status.[94] The current migration pattern and refugee crisis have further deepened this gap between classes, giving rise to a situation where the rich become richer and the poor become more deprived, as discussed in the following section.

THE PROBLEM OF ECONOMIC WEAKER SECTIONS

The concentration of economic activities in cities and the highest general standard of living caused a wave of migration from rural to urban centers; the new neighborhoods created to accommodate these sections of the population were formed based on non-Muslim planning techniques and subdivision standards.[95] The majority of these buildings were either apartment blocks with a high population density (high density, high rise) with disproportionate open spaces for use by the inhabitants, or independent dwelling units in the form of villas (low density, low rise), which left huge wasted spaces between them. This created the subdivision system known as "The Grid Iron Plan," which was driven by capitalist mentality that aimed at extravagant display of wealth with its imbalanced consumption and inappropriate usage. The economic weaker sections in such cases

94 Stefano Bianca, *Urban Form In The Arab World: Past and Present* (New York: Thames & Hudson Inc, 2000).

95 Moustapha, *Islamic Values in Contemporary Urbanism*.

occupied the declining quarters of a city or the industrial suburbs with poor living conditions and housing facilities that was developed in a haphazard manner, with no social integration with other sections of the local society. With regard to such a planning system, architect Hassan Fathy remarks: "With regard to a gridiron town plan, buildings crowded in the city center affect wind movement in that quarter, creating eddies and lowering the wind velocity by friction and change of direction… if the architect must adopt a gridiron street pattern with wide avenues, then sufficient green areas should be spread over the geographical area in order to redistribute the heat evenly within the city and avoid its concentration in the center."[96]

In his book *Dwelling in Developing Countries* (1963), Fathy recalls how the majority of city dwellers in such a setting are discontented with their dwellings and have a desire for detached houses or a building with few stories, with ample garden spaces for interaction.[97] In the current scenario, approximately 1.8 billion people worldwide live in homelessness and grossly inadequate housing, often in overcrowded conditions, lacking access to water and sanitation—making them particularly vulnerable to security issues and in a pandemic situation.[98] In addition, the United Nations reported that an unprecedented 70.8 million people around the world were forced from home by conflict and persecution at the end of 2018 (Figure 6).[99] However, for this intensifying housing crisis, the solution is not to build Western-style multi-story concrete blocks with ill-fitting cells and no connection to nature, which are hideous and inhumane. Every human, whether living in a rural or urban context, requires the same structurally comprehensive refuge to protect his individuality and to calm his spirit.[100]

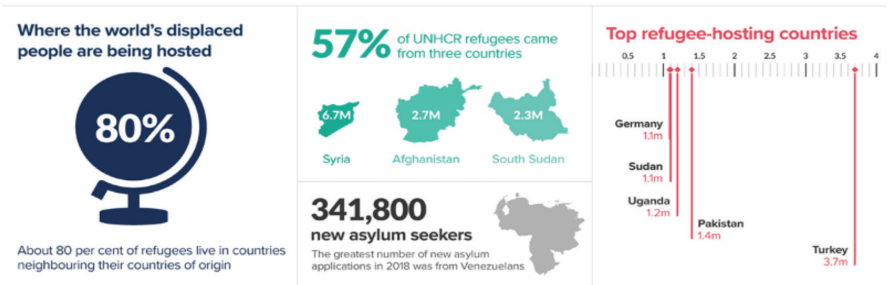

Figure 6. Statistics showing the number of refugees living in countries neighboring their country of origin. Source: Open source by the UN.

96 Fathy, *Natural Energy and Vernacular Architecture*.

97 Hassan Fathy, *Dwelling in Developing Countries* (Geneva: Aga Khan Trust for Culture, 1963).

98 OHCHR. ""Housing, the front line defence against the COVID-19 outbreak," says UN expert," (UN Human Rights: Office of the High Commissioner, March 18, 2020), https://www.ohchr.org/EN/NewsEvents/Pages/DisplayNews.aspx?NewsID=25727.

99 United Nations. "Refugees," *United Nations*, April 20, 2020, https://www.un.org/en/sections/issues-depth/refugees/.

100 Fathy, *Dwelling in Developing Countries.*

Man is inseparably linked with nature, and the blue planet's survival and its symbolic representations through gardens and courtyards have served to further man's harmonious relationship with nature and the Absolute.[101] Any building typology that seems to be devoid of elements of nature can prove to be distressing and cause discomfort to its occupants. A shift in the conceptualization of man's relation with nature occurred with the advent of the sustainability era; the initial assumption of the environment being hazardous to humans changed vice versa in the postmodern world where man was portrayed as hazardous to nature, and in the contemporary world it has been understood that neither are dangerous to each other if handled carefully, but both can be if not.[102]

Today, the emphasis on the relationship between the social and environmental components of sustainability is more pronounced than ever before. The COVID-19 pandemic has put a spotlight on housing quality, which is crucial for our health and hence can no longer be swept under the carpet. The issue is not limited to poor quality substandard housing; it has also affected the residents of high-rise tower blocks in the cities. This is because people live in close quarters, and shared facilities make them a high-risk setting for outbreaks of infectious disease.[103] In addition, the strain on people's mental health due to the absence of elements of nature has also raised concerns. The positive impact on our mental health from time spent in nature is essential, and those living in urban environments are already experiencing the ill effects of high-density living and limited green space.[104] This is yet another lesson learned from the pandemic—a "nature deficit" setting affects our physical health and mental well-being adversely; hence, it needs to be incorporated extensively in our residences and urban planning at large.

SAFEGUARDING TRADITIONS AND CULTURES AMONG SOCIAL DIVERSITY

Contemporary urbanism can be absorbed into the Islamic context by embedding it with the regional and cultural variables. Architects need to evolve techniques that are appropriate to the climate and economy particular to a region.[105] It is therefore important to reexamine the cultural expression of a society. Architecture based on appropriate technology should employ a language that is fitting and meaningful to the context of a specific culture.[106]

101 Ardalan, "Simultaneous Perplexity".

102 Leeuw, *Social Sustainability*, Past and Future, 20.

103 Misha Ketchell, *We Could have More Coronavirus Outbreaks in Tower Blocks. Here's How Lockdown should Work,* July 14, 2020, https://theconversation.com/we-could-have-more-coronavirus-outbreaks-in-tower-blocks-heres-how-lockdown-should-work-142297.

104 Misha Ketchell, We *Could have More Coronavirus Outbreaks*.

105 Kamil Khan Mumtaz, "A Search for Architecture Based on Appropriate Technology," *Theories and Principles of Design in the Architecture of Islamic Societies* (1988): 125–31.

106 Mumtaz, "A Search for Architecture Based on Appropriate Technology".

Nader Ardalan, in his design of the headquarters of the oil and gas industry of Abu Dhabi in 1990, illustrated the flexibility in design, "representing a wide range of aesthetic approaches from a highly technological interpretation to a much more traditional rendering of the theme."[107] The landmark design, which functionally integrated the architectural heritage of the region with its outstanding features of the design, is a great atrium placed at the very heart of the building containing the "hidden, vertical garden" that brings filtered natural light, a view, and a symbolic sense of regeneration of a verdant garden (Figure 7).

Figure 7. The view of the central atrium of ADMA-ADGAS HQ in Abu Dhabi containing a vertical garden. Source: Nader Ardalan.

Architects concerned with mass housing most often avoid dealing with each individual separately, citing time constraints; however, considerations must be at individual levels to provide apt dwelling facilities. There needs to be a return to the inherent building practices and urban principles in contemporary Islamic cities. The principles and values that are archetypal and universal to most of humanity need to be put into practice in a socially diverse society. Standardization and prefabrication techniques may be adopted, but they should allow variety in form, color, size of unit, and spaces to achieve individual identity and mix between various client requirements.[108] An ideal and efficient neighborhood that prevents social and economic segregation can be achieved by following these strategies. Another way to preserve the traditional urban fabric of a city is by maintaining and managing the old parts of the city with historical values, which can be

107 Ardalan, "Simultaneous Perplexity".
108 Moustapha, *Islamic Values in Contemporary Urbanism*.

developed to become tourist hotspots while upholding the identity and integrity of the local architecture

Residential units attached externally should have internal courtyard gardens surrounded by walls, making them central to the dwelling. Individual consultations with the inhabitants would help the architect create structures with long-lasting comfort. For a more refined approach, using local labor provides them their right to earn and retain their cultural identity in architecture, as well as teaching them new skills to upgrade their techniques and make them more efficient, which can also be categorized as sustainable. This technique was adopted by Hassan Fathy to build the New Gourna Village in Egypt, which was a high-density, low-rise courtyard development (Figure 8).

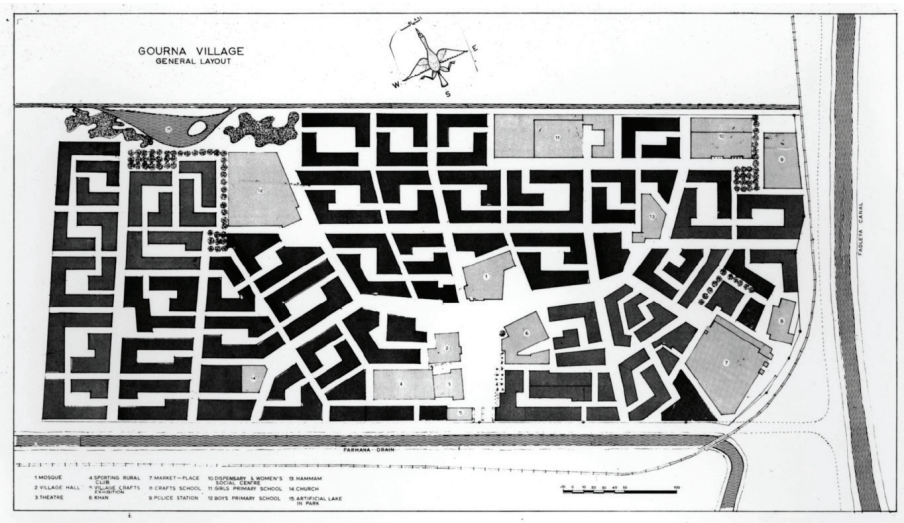

Figure 8. Master plan of New Gourna Village near Luxor, Egypt by Hassan Fathy, which was only partially developed. Source: MIT Libraries.

Elements of Islamic traditional architecture, such as the *sahn* (courtyard), *takhtabush* (a modification of the courtyard), and the *malqaf* (wind catcher), harness climatic conditions to provide architectural and thermal comfort, fulfilling the purpose of aesthetics and function. The architect must take into account the natural forces acting upon a structure and harness them efficiently with minimum economic and energy wastage. Traditional designs take advantage of climatic conditions and local materials, avoiding the use of materials and techniques foreign to the region with negative consequences, as Fathy remarks: "Willfully to break a tradition in a basically traditional society like a peasant one is a kind of cultural murder, and the architect must respect the tradition he is invading."[109]

109 Fathy, *Architecture for the Poor*, 25.

CONCLUSION

From the previous sections, we see that the identified principles of sustainability in Islam have been manifested throughout Islamic traditional architecture, which have proven to be effective in terms of economy, comfort, and standards. However, today, its practicality has not been adopted on a global scale and its possibilities remain disregarded. For this reason, we must understand that modern technology is not outside the framework of Islamic principles. It is worth noting that some principles put forth from the Islamic perspective of sustainability, such as social/economic justice (*'adl*), moderation (*wasat*), perfection (*ihsan*), and balance (*mizan*), coincide with the goals being pursued by the conventional model of sustainability. However, it is the intent, the conscience, and the methods of implementation that differ in both the models. In order to apply these principles in the global context, the preconceived notions that Islamic values are impractical and only exist in theory need to be eliminated and dialogues between these two models of sustainability ought to be established, in order to develop more effective and efficient approaches for sustainable development.

It is essential to ensure that the challenges and responsibilities are shared and equal opportunities are established globally, in order to attain sustainable development. The so-called "progress" made by science has had devastating consequences on the world—the awareness of this truth has now made the vast majority rethink strategies for development in a sustainable manner. Nevertheless, a systematic application of science to harness natural sources of energy will prove to be far more productive than the vernacular/traditional architecture, but without foregoing the very essence of these architectural typologies.

The process of urbanization is inevitable and therefore should take place without deteriorating existing practices and local traditions of the context while simultaneously increasing the quality of living standards. On the one hand, we need to reaffirm traditional and cultural values and identities; on the other hand, this adherence should not cause the Islamic world to fall back in terms of the development associated with the geopolitical economic order. The possibility of sustainable development by incorporating Islamic urban principles into contemporary urbanism in order to suit local contexts cannot be ignored, and it requires urgent attention and should be subject to further research.

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