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Re-questioning Green Architecture in Egypt: A need, a movement or a style?

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Re-questioning Green Architecture in Egypt: A need, a movement or a style?

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Abstract

Green architecture is considered the contemporary architectural paradigm. Amid threats of the lack of non-renewable energy, the calls for environmental sustainability and sustainable development, being 'green' is becoming an aspiration as well as a threat for many architects. Architects to a wide extent are required to adopt one sort of being 'green' in their contemporary additions to the built environment. However, very limited differentiations are subjected to the difference between 'sustainable architecture', 'environmentally-friendly architecture', and 'green architecture'. This is one side of the debate; however, the most important side is, whether this new trend in contemporary Egyptian architecture is a need, a movement, or merely a style. The other important query is whether 'sustainable architecture' is becoming a commodity to fulfill international claims regardless of how it is implemented. In order to answer those questions, the paper first presents the differences between notions of 'green architecture', 'sustainable architecture' and 'environmentally-friendly architecture' and based on literature review as well as observations from international precedents. Afterwards, those three notions are explored and analyzed in the Egyptian context to understand where precisely the claimed sustainable or environmentally friendly buildings in Egypt stand in relation to the outcomes of the literature review. Finally, the need for following those notions in Egypt are re-questioned, in order to explore whether the claims for sustainability are becoming a commodity, especially in the shadows of the misuse of previously discussed slogans.

Keywords:

Commodity in architecture, Green architecture, Sustainable architecture in Egypt.

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1. Introduction:

The paper aims to explore the state of contemporary architecture in Egypt based on a group of common concepts and ideologies related to environmental architecture. In order to do so, the paper follows a methodology primarily based on literature review of the concepts of “green architecture”, “sustainable architecture” and “environmentally-friendly architecture”. Following that two cases of the local attempts are analyzed based on the main concepts and strategies of each case. A final discussion is then presented to re-question the state of the selected cases in the analysis according to the definitions explored previously. This helps in drawing a better conclusion for the paper to pinpoint the needed achievements related to the built environment in Egypt.

2. Literature Review: Definitions Related to Study:

This part explores the terms “green architecture”, “sustainable architecture” and “environmentally-friendly architecture”. The aim of this part of the literature review is to understand the broad concepts related to environmentalism as a dominant architectural concept. Thus, this will aid in evaluating the Egyptian experience in this field, based on points of analysis to be summarized at the end of the definitions debate.

2.1. Green Architecture

As Raof (2011) presents, the shift towards green design was initiated strongly in the 1970s and was a “pragmatic response to higher oil prices”. It was then that the first of the oil shocks, in 1973, increased fossil fuel prices to an unprecedented extent, and the ‘futurologists’ began to look at the remaining resources to estimate the future of energy consumption on Earth, (p. 1). Accordingly, this point of initiation of the 1970s resulted in the rise of what was called the solar house movement; homes built to use clean renewable energy from the sun, (p. 5).

As a matter of fact, many scholars explored how in Architecture there are many ways a building may be “green” and respond to the growing environmental problems of the planet. From those are Ghani (2001), who presented the five basic areas of an environmentally oriented design. Those scopes are “Healthy Interior Environment”, “Energy Efficiency”, “Ecological Building Materials”, “Building Form” and “Good Design”.

Those five scopes are further explained as follows by Ghani (2001); “Healthy Interior Environment” is related to how well insure the building materials and systems used do not emit toxic unhealthy gases and substances in the built spaces. Further extra care and measures are to be taken to provide

maximum levels of fresh air and adequate ventilation to the interior environment. As to “Energy Efficiency”, it is related to ensuring that the building's use of energy is minimized. This includes various HVAC systems and methods of construction as well, which are to be designed to minimize energy consumption. The “Ecological Building Materials” aims to provide the use of building materials from renewable sources and having relatively safe sources of production. As to the “Building Form”, this is essential to respond to the site, region, climate and the materials available thereby generating a harmony between the inhabitants and the surroundings. Finally, “Good Design” aims to provide both “Structure and Material” and “Aesthetics” are the basic attributes of defining design. They should be so integrated that the final outcome is a well built, convenient and a beautiful living space, Ghani (2001, pp. 21-22).

2.2. Sustainable Architecture

One of the most debatable concepts which emerged lately, especially with relevance to architecture is the terminology of “sustainability” and “sustainable architecture”. Thus, the vagueness of the word “sustainable” makes the term “sustainable architecture” equally vague and ambiguous. There are different dimensions of sustainability; economic, political, social, or environmental, while we have to take into consideration that what is “sustainable” for one group is not necessarily sustainable for another as Hagan (2001, p. 3) exposes.

The literal interpretation of the words "sustainable environment" as Milosevic (2004) presents is the creation of an environment for human occupation, performance and the support of life to which sustenance or nourishment is continuously given, (p. 91). This includes the more wide dimension of sustainability as "meeting the needs of the present without compromising the ability of future generations to meet their own needs", (p. 92).

This more well-known definition is associated with modifying patterns of development and consumption to reduce demand on natural resource supplies and help preserve environmental quality. Achieving greater sustainability in the field of construction is particularly important, because building construction consumes more energy and resources than any other economic activity. Not only does a home represent the largest financial investment a family is likely to make, but it also represents the most resource- and energy-intensive possession most people will ever own. Making homes more sustainable, then, has a tremendous potential to contribute to the ability of future generations to meet their own needs. Thus as Ghani (2001) explains, specifically sustainable housing design is a multifaceted concept, embracing major concepts such as : “Affordability”, “Marketability”, “Appropriate

design”, “Resource efficiency”, “Energy efficiency”, “Durability”, “Comfort” and “Health”, (pp. 23-24).

Guy and Farmer also classified sustainable architecture under six different categories based on the main logic and methods as: eco-technic, eco-centric, eco-aesthetic, eco-cultural, eco-medical and eco-social. One or more logic can be found in a sustainable architecture according to the main environmental problem. Definition of “sustainable” for an architecture changes depends on the logic. “Eco-technic” logic defines sustainable architecture as energy-sufficient architecture placing importance to the development of technology while in “eco-centric logic” sustainable architecture is considered to be an architecture that is a part of nature through using natural materials and has zero ecological footprint. Sensuous, stylish and creative qualities make the green architecture as sustainable for “eco-aesthetic” logic. On the other side, architecture creating “healing environment” and supporting the healthy lifestyle of the people is considered as sustainable within eco-medical logic. Also, there is an eco-social logic defining the architecture that embodies the spirit of the society, freedom and togetherness as sustainable, (pp. 262-263).

2.3. Environmentally-Friendly Architecture

The term “environmentally friendly architecture” is primarily related to energy efficiency and energy economics. Taking into consideration the interrelation of architecture with both art and science, limiting architecture to environmentally- friendly aspects limits architecture to science, technology and economics. This is related to affecting the architect’s choice to the degree to which energy efficiency and economy of means are a greater priority than any of the others involved in the design process as Hagan (2001) exposes. If they are the most important consideration, then the architecture will inevitably reflect its supremacy in configuration, in choice of materials, in techniques and technologies employed (pp. 4-5).

As a matter of fact, the environment is more than just the biosphere, into which we should adapt to or totally ignore. It is also the ‘built environment’, a cultural as well as a physical entity. Thus, the most debatable question remains whether architects pursuing sustainability can afford to address only the environmental aspect of the built environment when it is qualitative as well as quantitative? Architects view ‘environmental architecture’, like ‘green architecture’ before it, as part of yet another ‘back to nature’ movement in which we all weave our own clothes and villages. For such skeptics, ‘environmental architecture’ connotes a narrowing of horizons, an abdication of ambition and imagination, and a self-imposed restriction to a palette of twigs and thatch as Hagan (2001) questioned, (p. 11).

2.4. Summarizing the Definitions:

The following table, (table 1) summarizes the main definitions explored in the previous part based on different scholars' reviews, to aid in the classification of the Egyptian Architectural experience related to environmentalism. The table also highlights the main aspects of analysis related to each concept to be used in the analytical part.

Table 1. Main Concepts and Analysis Aspects Extracted from the Literature Review.

	Green Architecture	Sustainable Architecture	Environmentally-Friendly Architecture
Definition	Architecture focusing on the use of renewable energy with lesser dependency on fuel and petroleum.	The creation of an environment for human occupation, performance and the support of life to which sustenance or nourishment is continuously given.	The creation of architecture related to energy efficiency and energy economics.
Points of Analysis	And another entry	Affordability. Marketability. Appropriate design. Resource efficiency. Energy efficiency. Durability. Comfort. Health.	Energy Efficiency. Energy Economics in the design process.

3. Analysis of The Egyptian Experience in Environment-oriented Architecture :

This part is concerned with exploring and analyzing the Egyptian architecture experience in the attempts towards implementing agendas related to environmentalism, either through governmental initiatives or through individual architects' works. The two selected examples are the Green Pyramid Rating System, which was elaborated as building regulations by the government, but still not applied on a wide scale and the other case is the vernacular architecture projects related to Hasan Fathy's school in architecture. The

analysis aims to cover the main concepts and initiatives in each case, followed by a categorization of each attempt according to the previously discussed literature review. The outcomes of the analysis pinpoint the current state of the Egyptian trials to attain environmental architecture either as a way to promote architecture or real trials aiming to provide better environment.

3.1. The Green Pyramid Rating System in Egypt:

The Green Pyramid Rating System (GPRS) is a national environmental rating system for buildings. It provides specific criteria by which the environmental credentials of buildings can be evaluated, and the buildings themselves can be rated (The Green Pyramid Rating System, First Edition 2011). It was drafted by the Housing and Building Research Centre (HBRC) in conjunction with the Egyptian Green Building Council (EGBC) in 2010, and the first edition was made available for public review in April 2011. The GPRS provides 4 levels of certification depending on score of the project in the weighted factors; 'Certified', 'Silver Pyramid', 'Gold Pyramid' and 'green pyramid'.

This rating system aims to evaluate the buildings newly added to the Egyptian environment according to a group of aspects. This rating system was supposed to be implemented and widely elaborated as a building code for all new additions to the built environment. However, its application is not yet achieved. The delay in implementation led to the neglecting of those regulating aspects especially in the urban development boom Egypt is witnessing nowadays, since there is no regulating law for the creation of more environment- friendly buildings. On another side, this rating system was criticized for not adding any new aspects of achievement other than the already applicable LEED rating system. Thus, firms in Egypt aiming to provide a social responsibility towards the environment prefer to achieve LEED certificates.

As a matter of fact, spreading green architecture in Egypt requires reshaping the current legislations and codes. This starts by revising the existing local building laws and regulations. Numerous parts of the Unified Building Law no.119 released in 2008, and its executive appendix released by the Ministerial decree no. 144 in 2009, show negligence of important green concepts. However, many of these concepts were considered in the Green Pyramid Rating System (GPRS) public review edition released by the Egyptian Green Building Council (EGBC) –which was established the same year the Unified Building Law was released- and the Housing and Building Research Centre (HBRC) in April 2011, but with no specific schedule for releasing the final rating system or a timeline for enforcing it. This schism in building legislation policies makes it difficult to determine the right strategy for spreading green architecture in Egypt. (p. 60).

However, the drawbacks are that GPRS documentation does not specify any timeline for its enforcement although it described itself as legislation and although it describes the application of its contents as urgent. These negative aspects are mainly because the GPRS was made as a project for a legislation that is still under analysis and public review. However, the seriousness of the issue it addresses should have motivated the law and code makers to refer to it and give incentives for its application. (p. 63)

The GPRS has a hierarchy of scores, which are: (strong > 70% - medium > 50% -weak >50%), assigned according to the extent of application of rating criteria, which includes:

1. Site sustainability
2. Energy efficiency
3. Water efficiency (minimization and efficiency of water use)
4. Resources and construction materials
5. Indoor environment quality (ventilation and lighting quality, acoustics control)
6. Innovation, inventiveness and flexibility of management and maintenance
7. Reduction of pollution and recycling of waste.

All the above aspects are used in the following equation to calculate the overall percentage of Green Pyramid criteria met: total percentage of criteria met / the number of criteria. (pp. 13-14)

In addition to this, The Green Pyramid Rating System is designed for use in new building works. The Rating can be used to assess individual new buildings at either or both of the following stages: at the Design Stage or at Post-Construction Stage. It will be mandatory for applicants wishing for a Green Pyramid assessment at Post-Construction stage to have first undergone a Green Pyramid assessment at Design Stage, (pp. 7-8). The following table, (table 2) shows the relative weight of each aspect of the evaluating criteria.

Table 2. Green Pyramid Categories and Weighting.

Green Pyramid Category	Category Weighting
Sustainable Site, Accessibility, Ecology	15%
Energy Efficiency	25%

Water Efficiency	30%
Materials and Resources	10%
Indoor Environmental Quality	10%
Management	10%
Innovation and Added Value	Bonus

To earn Green Pyramid certification a project must satisfy all the stated Mandatory Minimum Requirements and may obtain Credit Points by meeting certain criteria. Projects will be rated, based on Credit Points accumulated, according to the following rating system:

GPRS Certified: 40–49 credits

Silver Pyramid: 50–59 credits

Gold Pyramid: 60–79 credits

Green Pyramid: 80 credits and above

Projects with less than 40 credits will be classified as ‘Uncertified’.

3.2. Vernacular Architectural Attempts in Egypt as Environmentalism Experience:

This part is concerned with exploring the Egyptian architects’ attempts in implementing vernacular architecture as a means of an environmental approach. The pioneer architect who initiated this movement was Hasan Fathy, through his projects calling for the cultural sustainability, continuity of space characteristics and the use of local materials and proper responses to nature through his projects in Gourni and other vernacular attempts in Egypt.

New Gourni Village (fig. 1) is seen as a reinterpretation of a traditional urban and architectural setting by Hassan Fathy who is an early visionary of sustainable architecture. It provides sustainability both in culture through use of local materials and techniques and in environment with its extraordinary sensitivity to climatic problems. It is an outstanding example of the integration of vernacular technology with modern architectural principles. Fathy brought back the use of mud brick (adobe) and with special techniques keep building cooler during the day and warmer during the night. Fathy believed that architecture was about bridging the gap between new architectural techniques and older techniques. These older techniques are sustainable and energy efficient, helping the villagers to reduce their reliance on modern technologies, which are not only expensive, but have negative effects on their culture and environment.



Fig. 1 – New Gurna Village by Hasan Fathy

Based on Hasan Fathy’s approach to architecture, architects like Ramy El-Dahan and Soheir Farid provided a continuation of his attempts to build with adobe, yet devoid of the cultural and social aspects of sustainability advocated by Fathy. Both architects used those techniques in touristic resorts in Gouna, as a sort of providing a new brand for architectural excellence. As a matter of fact, what initiated as “Architecture for the Poor” was transformed into “Architecture for the Rich”, (fig.2).



Fig. 2 – Gouna Resorts by Ramy El-Dahan

Another important attempt for the re-interpretation of Fathy’s attempts is the work by ECCA, “The Egyptian Earth Construction Association”, a group of Egyptian architect’s whose work was focused in Sinai, to re-adapt the local building techniques and traditions in a contemporary way of building. Their most acknowledged project was a Visitors Center in “Wadi el Gemal”, a natural preservative in Marsa Alam (fig. 3), in which all building materials and techniques were derived from the direct context.



Fig. 3 – Wadi El-Gemal Tourists Center

The Visitors' Center serves two main functions, first is orienting visitors and disseminating essential information about the park's nature and inhabitants (Ababda tribes) through maps, brochures, tours, audio/visual and interpretive presentations of the surrounding features (Wadies, Mountains, Coast, Reefs, Fauna and Flora). The main purpose of the facility is to increase Visitors' appreciation of, and sensitivity to, the distinctive natural, environmental and cultural resources of the area, and to aid the Egyptian Environmental Affairs Agency in securing the sustainable use of the bountiful assets of the region. Also, reception and welcoming pit-stop, that is predominantly open, serves basic Visitors's' needs such as refreshments, local crafts. In addition, it houses office space, a store room and provides ample uncovered parking at its front entrance. Restrooms are housed in a separate annex .

The Visitors' Center introduced in its composition the same materials used by the nomadic Ababda tribes in erecting their houses, the Bersh, the sole indigenous structure in the region. Living in a predominantly arid climate, the Ababda use local acacia tree branches as structural columns, sheet metal obtained from barrel drums and particle board as roofs and walls, in addition to woven palm tree leave mats to protect their homes from the elements. The building used local igneous Basalt stone quarried by the local Ababda tribes from nearby mountains as the main construction material for foundations, walls and columns. The prevalent architectural element that hovers over the building and conveys its main character while astutely protecting its spaces; is a large corrugated sheet metal roof covering a latticework of wooden trusses supported by thick stone bearing walls and columns. Underneath this roof a second ceiling made of modular palm tree midrib panels and wooden beams shelters the exhibition space. This double roof system, a main architectural concept, allows for the free permeation of air, thus, dissipating the heat of the desert direct sunlight. The thick bearing stone walls while acting as a latent mass for the enclosed exhibit space also shields the outdoor space from the strong prevailing northwest winds creating a comfortable shaded area through which Visitors can move freely. Openings are screened with rough tree branches to filter light.

4. Discussion: Questioning the Commodification of Sustainable Architecture in Egypt:

At the beginning of the twentieth century, Le Corbusier warned, ‘architecture or revolution’. At the end of the century, we know ‘architecture’ doesn’t have the power to be an equivalent term to ‘reform’. So we can’t say in the current context, ‘architecture or pollution’. The ideas developed in architecture and discussed in this paper as definitions and attempts by local Egyptian architects for the benefit of the built environment won’t ‘save the world’, but they may help save the built environment. In so doing, architectural practice could regain a moral and practical authority it hasn’t had, (Hagan, 2001, p. 15).

This is important to reflect upon in our discussion, since what the paper aimed to discuss primarily was whether the Egyptian attempts are serious enough to attain change in the built environment. The first discussed case was the Green Pyramid Rating System, which showed to be very much focused and inter-related with the concepts of “Green Architecture” and “Environmentally-Friendly Architecture”, however, as mere conceptual agendas without any applicable attempts derived.

The second experience discussed, related to individual architects’ trials to provide environment sensitive architecture, were mostly ‘sustainable architecture’ attempts, however, on a limited scale, without generalization on the scale of national projects. Those attempts also touched upon the issues of material sustainability, without much focus on the other aspects of sustainable architecture. Also, those attempts were at times used as a marketing and branding tool to promote for economic projects. Accordingly, the actual achievement of any of the previously discussed concepts of environmental architecture is still very limited in the Egyptian context, lacking laws and regulations primarily as well as general awareness among architects.

5. Conclusion:

The paper presented a review of the current state of environmental architecture in Egypt based on the selected definitions explored in the literature review. The outcomes of the paper were to answer the re-questioning of the need of adopting more serious attempts towards environment sensitive architecture. The cases used in the analytical part showed the gap between the governmental attempts and the individual attempts by architects. Thus, the need is not re-categorize or re-define the Egyptian experience, but actually to provide a totalitarian agenda focused on the real needs of the built environment in Egypt.

References

- Ayyad, K. and Gabr M. (2012). Greening Building Codes in Egypt. Sustainable Futures, *Architecture and Urbanism in the Global South*, pp. 60-69.
- Ghani, F. (2012). Issues in Sustainable Architecture and Possible Solutions. *International Journal of Civil & Environmental Engineering*, 12: 1, 21-24.
- Hagan, S. (2001). *Taking Shape: A New Contract between Architecture and Nature*. Oxford. Architectural Press.
- Kultur, S. (2012). Role of Culture In Sustainable Architecture. *Archi-Cultural Translations through the Silk Road 2nd International Conference Proceedings*. Japan, pp. 262-267.
- Milosevic, P. (2004). The Concept and Principles of Sustainable Architectural Design for National Parks in Serbia. *SPATIUM*, pp. 91-105.
- Raof, S. (2001). *Ecobouse: A Design Guide*. Oxford. Architectural Press.
- The Green Pyramid Rating System, (GPRS), Online Report.