

The role of building codes in supporting the spread of the green architecture applications in the Arab Republic of Egypt

Dr. Ahmed Salah Eldin Shiba

lecturer of architectural - Beni-Suef university

ashiba1979@yahoo.com

Abstract:

Codes and legislation of building contribute to the control and regulation of building inside societies. It is considered the main role to ensure applying the building requirements and standardize the urban style of cities. It represents the main aim of the enactment of codes and legislation of architecture and urban. Despite the codes and legislation that have contributed to achieving this aim to the limit, but have not been able to encourage owners and entrepreneurs to care for adding dimensions that give significant features for their projects such as preservation of identity, character, inclusion of projects in green architecture classification lists. It was because those codes did not contain incentives to encourage entrepreneurs and architects to add these dimensions, as well as, a lot of the environmental aspects for architecture or easement rights and cultural identity have overlooked and led to the separation of the society from its customs, traditions and civilizational heritage which are considered the important standards to support the principles of the Green Architecture. Therefore, this paper is considered as a serious attempt to induce the legislators avoiding the errors that lead to the alienation of architecture from their societies, without taking account of its surrounding environment, directing the codes towards stimulating the entrepreneurs and architects to add the social, environmental dimensions to their projects through reviewing the current errors about the building codes and providing the ideas about encouraging and inducing the decision-makers to contribute in spreading the applications of green architecture inside new cities which represent the core of future architecture in order to face the challenges that have now become imminent. In the conclusion of the search, there is an outline of the set of recommendations of the most important points which must be modified by the current building codes, foremost among which the building requirements under the Uniform Building By-Laws and the most important points to add to encourage the decision-makers either owners or architects to head toward the green architecture that became a necessary requirement to face the challenges of the future.

Key Words:

Building codes - Green architecture - legislation of architecture and Urban - The building requirements.

Preface:

The current laws did not take into account customs and traditions, which caused societies to lose their cultural identity, which is an important part of green architecture standards, other than not taking into account the environmental performance of buildings, and the requirements for dimensions, retreats and elevations did not take into account the environmental dimension. For example, determining a fixed width for the street, without considerations of street orientation, leads to a difference in the environmental performance of the buildings overlooking it, because directing a street in the north-south direction has a

different effect on the rates of heat gain and exposure to lighting for a street with the same width in the east-west direction; As well as not taking into account the heights between the building blocks of the impact of the movement of the sun and shadows on the buildings.

This leads us to the need to amend these laws to include the environmental side of architecture, as one of the important aspects, especially in light of the high energy prices and negative impacts on the environment; To consume more of them in order to improve the environmental performance of buildings, which is one of the most prominent causes of climate change, which in turn is one of the most important future challenges facing humanity.

Research problem:

Building laws and regulations lack incentives; To encourage decision-makers to go towards a green architecture, in addition to the failure to observe the structural requirements for the environmental dimension leads to alienation of the architecture from its environmental surroundings, whether at the level of environmental performance of buildings, or at the level of societal and cultural performance of society, and its association with its customs and traditions.

Research objective:

The research aims to achieve two main objectives that contribute to supporting green architecture applications, namely:

- 1- Achieving a set of incentives. To encourage decision-makers to move towards green architecture.
- 2- Shedding light on the current texts of the building codes that must be amended, to improve the environmental performance of buildings.

Research hypothesis:

The research imposes that amending building codes to include the environmental and social aspect, and including incentives to encourage decision-makers to go towards green architecture, contributes to the production of architecture that is more compatible with its environment, and better able to meet future challenges.

Research Methodology:

The research follows two main approaches to reach the research objectives:

First: the observational approach:

It is to monitor errors received in the texts of building codes that do not take into account the environmental, cultural and social dimensions.

Second: the deductive analytical method:

It consists of analyzing existing texts, and devising modern texts that are better to be able to encourage decision makers. In order to go to green architecture applications.

Introduction:

Going towards an architecture compatible with its environment has become a necessary requirement in light of future challenges. Most notably, climate change is the result of excessive consumption of energy used; to improve the environmental performance of buildings in contemporary architecture. Therefore, researches at the end of the twentieth century and early 2000s went to find solutions to reduce energy consumption by improving the environmental performance of buildings, and moving towards green architecture applications. However, most of this researches did not find a societal resonance with its

application, although it provided innovative solutions to reduce costs and protect the environment; As a result of reasons, most of them have been associated with higher spot costs, in exchange for future cost reductions. Which requires searching for a solution to this crisis that leads to the limited spread of green architecture applications. This is what research seeks through one of the most important axes of closed-mindedness, whose attention and careful study may lead to an increase in the applications of green architecture and support its spread. Countries adopt policies that support the spread of green architecture applications, as catalysts for societal decision-makers from owners and architects-; To apply the foundations of green architecture with their projects - by enacting laws that motivate community decision makers to apply the foundations of green architecture; By encouraging the immediate costs, and waiting for future benefits in exchange for benefits that enhance their ability to bear the immediate costs.

1- Amendments to the building codes in the Egyptian state:

Throughout the ages, the governments of the Egyptian state took an interest in enacting and legislating laws to control the construction process from the Pharaonic state until the beginning of the Ottoman period during the period from 1517 to 1798 AD, where these laws were documented, as well as in the period of the modern state 1805-1879 AD, but the true beginning of the emergence of regulations was in the period from 1881 to 2008 AD, and it is considered one of the most important periods in which executive regulations of the multiple and changing building codes appeared during that period. "8". Construction work from 1881 was subject to the Higher Order, which was amended in 1889 and continued to work until the promulgation of Law No. 52 of 1940, which was continued until the issuance of Law 45 of 1962, which continued until the issuance of Law 76 of 1976, which is considered the Previous law of the Unified Building Law No. 119 of 2008. "4"

In general, amendments to laws during that period in response to societal changes, whether social or political, or to address gaps and problems, exacerbated, and law amendment became the solution to address them. The laws came especially during the period of the British occupation from 1882 to 1936 in their entirety starting from that period, excerpted from Western laws, which caused for architecture and urbanism to lose their cultural identity, and away from the customs and traditions of the ocean, as they did not take into account the climate differences between hot and temperate regions. It represented the aftershocks that opened the house to the inside to open to the outside, and did not take into account visual privacy, or climatic conditions; The building codes stipulated the determination of a recession between the plots of land intended for construction from the front and back, and from the sides, or one of the sides, or juxtaposition from the sides in some cases. As a result, external voids have emerged that have been proven by real experience they are not to be used and the inability of most of them to establish any external activity, either because of the inadequacy of its dimensions that may reach only 2.5 m, which means that they are not more than one pass, or as a result of the inability to use the external spaces most of the time of the year in the tropics. This means that these bounces do not bring any real benefit to the users. This drives many owners to build inside them by random, unauthorized methods, which loses back the main goal of them, which is to provide a space that allows to achieve adequate lighting and ventilation for the voids, in addition to providing visual and auditory privacy between neighbors.

2- Unified Building Law No. 119 of 2008:

The Building Law was issued as an alternative to Law No. 106 of 1976, that is, after more than thirty years, during which millions of building violations were committed, and despite that long period, legislative expertise was unable to reach the weaknesses in the previous law, which pushed employees to violate the law, and legislators' perceptions focused on the delay in the issuance of the license, and the individual desires of the users to violate the law, then the articles of the law focused on these two axes, the axis of obligating the concerned authorities to issue the license with a specific period not to exceed 30 days, and the second axis: restricting the users to specific structural requirements that are not subject to conciliation. And any exceeding in it requires removal in order to unify building requirements at the level of the Republic of Egypt. However, the requirements of the law did not take into account many of the fundamental differences between Egyptian environments, from culture, customs, and traditions, as well as the economic level, along with environmental conditions, from heat, humidity, and solar brightness, which led to the architecture not adapting to its environment, and its alienation. About the community; for not expressing its cultural identity and social customs; this hinders any attempt to support green architecture applications.

2-1 The general constructive requirements of the unified building law:

As a result of not taking into account the environmental aspects, climatic conditions, and social, cultural, and economic dimensions, many negatives emerged in the unified building law, and the research deals with the part related to building requirements, which is described in Chapter Three, Chapter One, starting from Article No. 91 and ending with Article No. 108, which are the articles that define the requirements of General Constructivism.

2-2 The importance of reformulating the general building requirements of the unified building law:

The reformulation of general building requirements is of the utmost importance to guide the designer and owner towards choosing applications that support green architecture, and this importance can be summarized in the following points:

- Organizing construction within societies, which is a fundamental role for unifying the urban style of cities.
- Preserving the cultural identity of the community and the distinctive architectural character.
- Avoiding the mistakes that lead to the alienation of architecture from its societies, and its lack of consideration for its environmental surroundings.

Motivating project owners and architects to add environmental and social dimensions to their projects.

- Publishing green architecture applications within new cities that are the nucleus of future architecture; In order to be able to face the challenges that have become knocking horizons.
- Adding dimensions from the environmental aspects of architecture, or easements and cultural identity to integrate society with its customs, traditions and cultural heritage, which are important criteria to support the principles of green architecture.
- Going towards green architecture, which has become a necessary requirement to meet future challenges.

3- Contribution of amendments to the unified building law in support of green architecture applications:

Amending the unified building law can contribute to supporting applications of green architecture by taking into account the environmental dimensions and climatic conditions in building requirements and respecting the climate differences for each region, in addition to the possibility of adding updated texts that give projects that adopt environmentally friendly strategies and applications special features that encourage owners to bear the immediate costs. The high level of green architecture applications, such as the use of solar cells to generate energy or heat water or the use of modern environmentally friendly building materials that contribute to energy efficiency, or even use the traditional insulation of the outer walls to reduce the waste of energy needed to improve the environmental performance of the building, whether by cooling in summer, heating in winter, or adhering to the architectural character, and supporting cultural identity, customs and social traditions. These incentives for projects that include applications of green architecture may include several aspects, including:

- 1- Exemption from licensing fees.
- 2- Reducing the prices of building lands.
- 3- Increasing the payment period for the construction lands without interest.
- 4- Land allocation by direct order.
- 5- Exemption from real estate taxes.
- 6- Exemption from contracting fees for utilities.
- 7- Exemption from real estate returns.
- 8- Allocating distinct plots of land without distinction fees.
- 9- Granting higher structural proportions that do not harm the general plans.
- 10- Acceleration of licensing procedures.

4-Experiences in amending laws to support green architecture applications:

Some countries have rushed towards amending building codes because they are convinced that building laws are the main source of society's orientation towards specific policies, and with the global energy and climate crises, the orientation towards green architecture has become a major demand for countries in the world.

5- Suggested guide content:

Most of the proposals for amending the articles in the building law provided for following the guide for the regions of Egypt, and the repetition of this text with the majority of the articles proposed to be modified is a clear indication of the necessity to respect the fundamental differences among the regions of Egypt, whether environmental, climatic, social, economic, or cultural differences as each region has its characteristics, its distinctive feature, and through studying the regions of the Republic of Egypt, they can be divided into six main regions according to the proposal illustrated in Figure 1, each of which includes three sub-regions that include the north, south and center. The division is also made according to the economic level of three levels - economic - medium - luxurious, and the separation between both urban and rural "villages - cities". Through the application of this guide, each region will have its cultural and social identity, and take into account economic conditions and human activities, in addition to taking into account the climatic aspect of energy conservation, and the inclusion of building codes on the incentives for the implementation of the guide is direct support for green architecture applications; This helps in spreading its application in the Republic of Egypt and confirms the research hypothesis.

Results:

- 1- The current texts of building codes use rigid engineering dimensions that do not have the ability to explain many cases of difference in building directions, street displays, retreats, and protrusion when applied in different environmental areas, or even when the direction toward the original destinations in a single location is different.
- 2- The planning requirements for residential blocks do not take into account the prevailing climate, nor can they distinguish between a hot dry climate or a hot, humid climate, so that the urban fabric appears to be inconsistent with its environmental surroundings, and it is not possible to apply according to these requirements the characteristics of the woven fabric or the tape fabric compatible with each pattern.
- 3- The current building law does not take into account the diversity and different Egyptian cultural and social environments, or the varied climatic and economic conditions.
- 4- Requirements and bouncing stipulated in the current building law, which does not take into account the specificity of the Egyptian society.
- 5- External spaces resulting from front, back and side bounce are not suitable for use in hot areas compared to assembling these surfaces on inner courtyards, and the orientation of the building inward helps to achieve greater privacy.

Recommendations:

- 1- The structural requirements must be modified to include latitude as a basic determinant within the engineering equations to reach the appropriate dimensions of streets, voids, heights, bounces, and protrusion.
- 2- The structural requirements must be modified to include relative humidity as a basic determinant for determining the pattern of urban fabric, the proportion of openings and the heights of buildings.
- 3- Laws should include prohibiting the use of building materials harmful to the environment or users.
- 4- Building codes must include occupational health safety requirements.
- 5- The conditions and bounces must take into account the prevailing climate and the suitability of these spaces for use.
- 6- The necessity of issuing a guide for the regions and territories of the Republic of Egypt, specifying the environmental, social and economic characteristics of each of them, and preparing it in a way that makes it a reference to the structural requirements of each region separately with dimensions and conditions that suit its different circumstances.
- 7- Conducting more research on the details of the guide for the regions of Egypt to include the climatic, social and cultural diversity of each region.

References:

- 1- alaa7a al tanfezea le qanwn el benaa al mow7ed rakm 119 le sant 2008.
- 2- amen, shimaa ahmed magdy, "el omran baen shkhset el makan wa ta3'eer el zamzn. resalt magster, kolet el handsa, gam3t el qahera. 2008
- 3- hossen, walaa ezat Mohamed, "taseer qawanen el benaa alaa el hawea el me3marea tatbek alaa el mogtaat el omrane el gadedda" resalt magster, kolet el handsa, gam3t el qahera. 2015

4-Sulaiman, Mustafa Muhammad Saeed" el beaa el dawea fe el mabany el saknea fez el tashreaat el benaa el mo3aserafe masr" " resalt magster, kolet el handsa, gam3t el qahera.2012

5-Abdel-Aal, Amani Ibrahim Abu Al-Majd "manhaget motawara le manzomat tatbek qanwnel benaa le tanmet el omran fe el modon el masrea" resalt magster, kolet el handsa, gam3t el qahera.2012

6-Awad Ahmed Ismail wa akharon "talbet e7teagat al ensan fe al maskn mn khelal el tasmem al dakhily" maglt el emara we el fonwm we el 3olom el ensanea, el mogald 5 el 3dad 21. 2020

7-Faraj, Saif Al-Din Ahmed "taqeem el tashreaat fe magal el omran" resalt magster, kolet el handsa, gam3t el qahera.1992

8-Farhat, Mostafa Ismail Abdel Mohsen "el b3d el beaey fe el tashreaat el benaiea el masrea" resalt magster, kolet el handsa, gam3t el qahera.2010

9-Youssef, Hassan Ahmed Hassan ""el qawanenwe el tashreat kadah lel hefaz 3al gawde el heah" resalt magster, kolet el handsa, gam3t el qahera.2010

1- <https://amaretna.wordpress.com/2017/06/22>