Environmental legacies and their impact on designing the interior spaces of modern residential homes in the Hashemite Kingdom of Jordan

Prof. Doaa Abdul Rahman Mohammed

Professor of Basics of Interior Design, Department of Interior Design and Furniture, College of Applied Arts / Helwan University.

doaagoda2018@gmail.com

Assist. Prof. Dr. Ibtisam Muhammad Khamis

Assistant Professor, Department of Interior Design and Furniture, College of Applied Arts / Helwan University.

dr.ebtesamkh@hotmail.com

Researcher. Ayman Mahmoud obeidat

Master student / Department of Interior Design and Furniture / College of Applied Arts / Helwan University.

obeidat.ayman96@gmail.com

Summary:

The geographical nature of the Hashemite Kingdom of Jordan is characterized by the diversity of environments and different climatic conditions, in addition to its great and varied richness in the cultural legacies found in the design of the internal spaces of the heritage houses. Those architectural legacies that have contributed to preserving the special features of peoples and countries and their cultural differences. With the increase in interest in these environmental components in design, it was found that many buildings and their designs contain many architectural environmental treatments, which can be used in the design of modern homes, as they work to enhance the internal environment by employing available environmental elements to reduce the negative effects on construction and nature, and take advantage of the natural environment in order to enhance the internal environment, which provides the highest levels of comfort in the design of homes and reduces energy consumption and saves the environment. Where the study monitors the environmental design and the concept of environmental design and the foundations and principles of environmental design, to identify the suitability of the design for these buildings with environmental architecture. Where the research intends to monitor and analyze how to make use of the heritage houses and their internal spaces in the design of modern houses, and one of the most important results of the research was that the planning of the heritage houses adopted the architectural style known as the house with an open central courtyard that performs its function as the axis of movement and the connection of all the facilities of the house with each other, in addition to its function in providing lighting and ventilation for the rooms of the house. As for the modern house, its layout was adopted with an outward orientation, and it lacks the architectural vocabulary through which the efficiency of lighting and ventilation is achieved. Also, the heritage houses used building materials that are compatible with the local environment, working to achieve thermal comfort for their residents by achieving more thermal stability than it does not require the use of mechanical conditioning, which in turn reduces energy consumption and does not cause a negative impact on the environment. In modern homes, most of the building materials used are manufactured and

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unsanitary. Heritage houses are characterized by providing natural lighting at different times, but in modern homes, most of the times, industrial lighting is turned on as a result of not placing architectural openings in suitable places.

Key words:
design legacies, interior spaces, environmental design, heritage houses, modern houses.

The environment is one of the most important components of the system in which man lives, as it is considered a medium for practicing all human activities. Building is one of the activities that humans practice on the ground as a result of what is being constructed of various buildings on the environment, and the house is only part of the natural environment and the systems it contains. Environmental architecture is one of the processes that ensure the building is designed in a manner that respects the environment, taking into account the reduction of energy, materials and resources consumption, minimizing the impact of construction and use on the environment, and maximizing harmony with nature. So that the design takes into account economic, social, political, or technological factors, taking into account the factors of the components of the natural environment, including biological or abiotic content, that fulfills all needs and does not negatively affect them (5: pp. 7-8). And because the nature of the geography of the Hashemite Kingdom of Jordan is characterized by the diversity of environments and different climatic conditions, in addition to its great and varied richness in the cultural legacies found in the design of the internal spaces of the heritage houses. The fact that the architectural heritage is one of the most important elements in preserving the characteristics of peoples and countries, and due to the great interest in the environmental components in design, it was found that there are many designs in the design of these heritage buildings that carry many of the components and environmental treatments that can be exploited or employed in the design of these buildings, providing comfortable living for centuries, by exploiting local resources available in the environment, and through the exploitation of architecture to find solutions to climate problems and the aesthetics of the architectural elements of the buildings. The research aims to compare the architectural environmental treatments of the ancient and modern Jordanian dwellings, and the mechanism of employing environmental treatments in the design process, in addition to how the modern architecture benefited from the old in designing modern residential homes in Jordan.

Research problem:
Most modern residential homes lack in their design the advantages achieved by heritage houses, such as comfort inside the building, integration with the environment, energy saving, and the use of environmentally friendly building materials, in addition to the use of new building styles that do not suit the surrounding climatic conditions and the use of architectural elements that are not compatible with The region, and the fact that the heritage houses have achieved these advantages, must be taken care of to preserve them, and attention to documenting them, knowing their vocabulary, studying them architecturally and designing to benefit from them in designing modern environmentally friendly homes.

Research importance:

Highlighting the role of environmental design, the value and applications of environmental architecture in the architecture of Jordanian heritage houses, in achieving a balance between environmental requirements on the one hand and user requirements on the other hand, and making use of them in the architecture and interior design of modern residential homes.

Research goal:

Documenting the internal spaces of the Jordanian heritage buildings, in line with the functional values and the climatic treatment of the elements of the internal spaces, to confirm the functional and aesthetic values of them, to enrich the interior design of modern homes so that they are environmentally friendly by being affected by the heritage houses and activating their positive impact on the souls of their users and using them to improve the culture of society by reviewing the features expected from the comparison and benefiting from the experience, to realize the criteria and methods for classifying the used architectural environmental treatments.

Research significance:

By providing knowledge of heritage buildings, and knowing how to use their environmentally friendly architectural vocabulary, it will lead to knowledge of how to exploit and employ those vocabulary and deal with it in the design of modern residential homes.

Research Methodology:

The research followed the descriptive and analytical approach, as it depended on a description of one of the heritage residential buildings in the Hashemite Kingdom of Jordan, and then a precise description of one of the modern residential buildings, the research sample, and an accurate analysis of the buildings.

Search limits:

Spatial Frontiers: The Hashemite Kingdom of Jordan.
Temporal boundaries: current time.

Research topic:

Environmental design is a form of design that works to reduce environmental destructive impacts by integrating it into life processes (p18: 11). Design is also one of the integrated design areas, which in turn protect the environment.

It is a type of design that acts as a means of organizing in our world and not just a means of forming products. This is consistent with the recommendations of the (Earth Summit on the Rubble of Our Planet) in 1992, the most important of which was that the designer must be challenged to confront the six human problems(Quality of life, effective use of natural resources, protection of global denominators, management of human populations and environmental use of chemicals, management of human industrial waste and the promotion of continuous and renewable economic growth at the global level (p:7.711).

Environmental buildings have many different features on three levels, advantages at the environmental level, advantages at the level of public health, and economic advantages of

environmental building resources (10: P9). As for the advantages at the environmental level, they are represented by the natural resources that contribute to the rationalization and production of construction systems appropriate to the surrounding environment, and to contribute to overcoming some problems at the environmental level, and to create more healthy spaces that reflect production. As for the advantages at the public health level, it is represented by the availability of materials that do not negatively affect health, and the availability of materials that are not dangerous to the work team upon construction. The economic advantages are supporting urban development with environmental construction that achieves the economic dimension, rationalizing spending in the construction sector, supporting the use of local building materials and recycling used materials, and selecting sustainable building materials so that they need less maintenance during operating periods that support the same concepts (3: pp. 78-79).

The application of design principles and standards in construction and design leads us to the environmental building, or the so-called environmentally friendly building, which takes into account the main principle of environmental architecture, as there are foundations and standards that must be met in an environmentally friendly building, which are as follows:

1)The use of energy sources in the building: as the energy problem represents a focal point in the midst of the current variables and the increasing rates of consumption, the amount of need, with its associated significant negative effects on various levels, including the environment, which led contemporary thought to the necessity of giving more research to achieve several goals (6 : P. 7), by finding continuous energy alternatives to fill the void left by that depleted energy, and rationalizing consumption as a form of integration with the provision of energy resources. In addition to the use of renewable energy sources, through the positive employment of renewable energy sources instead of conventional energy, with the aim of reducing the environmental damage that results from energy use (3: p. 46).

2) Resources used in environmental architecture: so that they should not be from materials that consume high energy, and not be among the causes of internal pollution of the building, that is, the building materials (and finishes) of natural building materials (8: p. 111).

3) Ways to conserve water in the building: through continued maintenance of sanitary devices, a set of plumbing installations, treating the water used in the building and reusing it, using devices that rationalize the use of water in the building, and using the roof of the building to collect rainwater (8: p.111- 114).

4) Fresh air inside the building: as it is important to direct the building openings to the direction of the wind, taking into account the presence of more than one opening inside any room so that there is an appropriate airflow for it, as for the presence of spaces not directed to the usual winds. Air hooks can be used.

5) Building lighting: The sun is the main source of natural light on the ground, as there are two basic ways to provide lighting inside buildings: the first is through natural lighting coming from the sun, and the second is through artificial lighting. Any environmental architectural vacuum must depend mainly on natural lighting, as it is the main source of light and the most comfortable, and the most important in sustainability (3: 63) because it has no side effects (an environmental and social dimension), free, and does not entail costs. As for the artificial lighting in the building, it is used in the event that the natural lighting is insufficient in the spaces far from the windows, and in the case of darkness (sunset).

6) The use of colors: colors are one of the main elements related to the activity of human life, in addition to the diversity of aesthetic effects they have inside the building according to need, as the colors depend on psychological and physiological effects on the person, and the colors of the external facades have environmental and climatic effects, as they affect the extent of absorption. Walls and ceilings are exposed to sunlight, so it is important to use light colors or close to white on them, as it has a great ability to reflect solar rays. Colors have two types of effect, a physiological effect: which is the effect of color on one of the human organs, such as the effect of the blue color on calming the nervous system, and the effect of using the red color in increasing blood pressure (2: 8), a psychological effect: which is the user's perceptual impressions, such as giving a sense of space, a sense of comfort and relaxation, fun and activity, effects of certain colors may differ from one person to the other (2: page 8).

7) Sound control: The sound has effects on a person's psychological and physical health. Quiet sounds have good psychological effects, unlike loud sounds (noise), as they have a harmful effect, as (noise) is one of the types of pollution that must be taken care of, due to its psychological and physical danger to humans. The noise has three sources (1: 56), the noise coming from outside the building, the noise caused by falling objects on the surface of the ground or as a result of vibrations of electrical devices, and the noise resulting from the transmission of internal noise through the walls and floors of apartments and adjacent spaces.

8) Architectural character compatible with the environment: so that the architectural character of the building must be compatible with its environment, from a social and historical point of view, and the customs and traditions of the community, since the architectural character reflects the image of human civilization, and touches the personality of society and the balance of the individual in it in terms of health and psychological. Where the architectural character affects a group of factors of the natural environment that determine the characteristics of the place such as geographic and climatic factors and the building of local materials, and a set of cultural factors resulting from the interaction of man with his natural environment, including the religious, social, political and economic factor, in addition to the philosophical, scientific and artistic ideas (8: P. 132).

9) The building's garden: as it works to purify the air from dust, fumes and the many wastes attached to it, in addition to its effect on softening the atmosphere and improving the local climate, especially in hot areas, as it provides shade in summer, allows the sun to enter in winter, and has a role in improving the psychological impact of humans at the level of clusters and residential neighborhoods (9: pp. 209-211).

In the context of the continuous endeavor to enhance the use of environmental design principles in the design of modern residential homes, this study examined the environmental legacies and their impact on designing the interior spaces of modern residential homes in the Hashemite Kingdom of Jordan, by documenting the internal spaces of the traditional residential house in the heritage houses of Jordan and the modern Jordanian house, including if it matches the function of the elements of its internal spaces and its design, and the documentation of the environmental aspects of these houses, and a clear picture of these internal spaces of the houses has been formed, and the environmental treatments used in these homes are known. As a comparison was made between a model of a traditional residential building (Nablus House) and a model of a modern residential building in the Hashemite Kingdom of Jordan, by analyzing the general shape of both models, the internal spaces, determinants of the internal space, the

functional divisions of the spaces of the two models, raw materials, and lighting, to reach a mechanism. Employing those environmental treatments in the Jordanian design heritage that were used in the environmental design treatments for modern homes, and how to exploit this heritage presented by the ancient Jordanian architect and construction in designing modern residential homes in Jordan.

Based on the comparison, it can be concluded that the principles and strategies that were used in the heritage architectural environmental treatments can be used in the design of modern homes, as they work to enhance the internal environment by employing the available environmental elements to reduce the negative effects on building and nature. And take advantage of the natural environment in order to enhance the internal environment, which works to provide the highest levels of comfort in the design of homes and reduces energy consumption and preserves the environment, by using and applying them in designing modern homes that are appropriate and environmentally friendly.

The search ends with the following results:

-The Hashemite Kingdom of Jordan has heritage architectural buildings prepared as many residential homes, following Arab House planning and architecture methods that are compatible with the environmental design, its vocabulary and strategies.

-The planning of the heritage houses was based on the architectural style known as the house with an open central courtyard, which performs its function as a hub for movement and connection of all the facilities of the house with each other, In addition to its function in providing lighting and ventilation for the rooms of the house, as for the modern house, its planning has been adopted by directing to the outside and lacks the architectural vocabulary through which the efficiency of lighting and ventilation is achieved.

-The use of building materials that are compatible with the local environment, which is characterized by sustainability, has led to the thermal comfort of the human being, by achieving more thermal stability than it is required with the use of mechanical conditioning methods, which reduces energy consumption, saves cost and does not cause a negative impact on environment, but in modern homes, most of them are unhealthy and manufactured materials.

-Heritage houses are characterized by providing natural lighting, but in modern homes most of the time industrial lighting is turned on, due to the placement of architectural openings in incorrect places, the size of those openings and the amount of lighting required.

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