

Green Heritage Chance- change- challenge

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(Methodology proposed towards the thought of compatibility with the Environment and preservation of Heritage)

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ABSTRACT

Environmental design is the specialized design in solving environmental problems and preserving them and employing them for human service. This is the science resulting from the integration of the architecture and engineering with the environment with the aim of developing general policies and comprehensive programs that are diverse and radical. They contribute to the preservation of the environment and improve its quality both in the present cities and the new cities. And future and thus make a contribution to the citizen's urban affiliation to his environment.

As for the Egyptian architectural reality, traditional architecture was an example of sustainability and then emerged models of the contemporary architecture that lost its identity and localization. It is no longer possible to categorize a clear, comprehensive and general direction that expresses and distinguishes it. It can be said that it gave a result to repeating more boring forms of our cities and architectural and technical chaos. Have become familiar to the environment in terms of location and climate and are disproportionate to the social and cultural values of our society.

Due to Egypt's special nature, the trend towards environmentally friendly architecture has become very important due to its lack of energy sources, political crises, water scarcity and severe environmental pollution. The importance of this issue is further exacerbated by the absence of any formal regulatory framework that stimulates the process of urban construction in environmentally compatible ways for better internal and external environment. therefore The research discusses the methodology of preserving heritage through the thought of compatibility with the environment.

Key words (environment,archiecture,heritage,energy)

1-Introduction:

After the industrial revolution and the control of machinery and technology on the process of construction, considered the architectural product a machine live within the human, resulting in many environmental problems, the most important environmental pollution and separation between man and its

natural environment and the resulting imbalance in the psychological and biological balance with the scientific and technical development and incompatibility between the planning processes Design, natural environment and surrounding conditions, and with higher exploitation of natural resources and energy, which led to a significant decrease, came the call for compatible architecture, where compatible architecture aims to achieve the ideal design Which provides balance and thermal comfort within the architectural spaces in buildings, which affects the efficiency of environmental performance and reduce energy consumption. Architecture is indivisible from the environment. Architecture is the art of mass formation(8).

All the daily phenomena and indicators confirm that the curve of energy consumption in all its forms is increasing and contemporary buildings do not neglect the use of energy to operate it and adapt it to the needs of its inhabitants. It is essential for lighting the buildings and operating the various electrical and mechanical equipment needed to serve it. This is in addition to the energy necessary to prepare the building for the convenience of its users and to achieve its basic function with the expected efficiency. Where the thermal comfort of the occupants of buildings is essential to achieve the functions designed for them. To achieve this, the research discusses a methodology to create a suitable environment with the appropriate temperature and humidity, as well as sufficient natural ventilation to achieve the required air quality and to achieve the appropriate lighting by relying on some of the vocabulary of the heritage of the Egyptian environment.

2. Research methodology:

To access the proposed methodology for research, follow the following methodologies:

First: descriptive and analytical approach

- Review the concepts and principles of environmentally compatible buildings.
- Analysis of the standards of building compatible with the environment, including the conclusion of the most important standards directly affect the environment.

Second: Analytical approach

- study and analysis of a collection of heritage vocabulary that achieved the thermal comfort of the past through tables and drawings to reach the collection of traditional vocabulary that can be relied upon to achieve the standards of compatibility with the environment and through this we can identify the .recruitment and use of these vocabulary in modern buildings.
- A set of results and recommendations of the research.

3-Environmental Architecture, Environmentally Compatible Buildings (Concepts and Definitions):

Environmental architecture: This is the built environment that does not destroy biological systems and preserves the earth's permeable resources, which have functional and comfort features. The Concept of Environmentally Compatible Buildings: An integrated concept that starts from the idea of constructing the building to design, construction and business management until we reach the end of the construction period of the demolition and construction of a new building, this concept depends on alleviating the negative effects that may affect the environment inside and outside the building(8).

We can clarify the concept of buildings that are compatible in terms of (environmental design): that is the specialized design in solving environmental problems and preserving them and employing them to serve the human being - the (compatible construction): the use of local natural resources as far as possible and away from the manufactured resources ... so that all materials (Efficient use of resources), rationalization of resource use, and (business administration): This phase is characterized by several factors, including the efficiency of the performance of the engineer and the webmaster to implement the work in a timely

manner and use the implementation method which reduces From Energy wasted in transport and installation, etc.. Must balance the ratio of equipment to reduce labor and implementation of energy consumed in the construction and finishing, either (compatibility and end of the building age): The materials used can be recycled (eg the use of construction products or debris in landfill works, the use of recycled glass, the use of recycled wood).

The concept of "compatibility with the environment and conservation of heritage" is defined as: the science of integrating architecture as an art and architecture with the environment, with the aim of developing general policies and comprehensive and diverse programs that contribute to the preservation and improvement of the environment in both existing cities and new and future cities. Weight in the urban citizen's belonging to his environment.

4- Compatible building standards

The agreed building assessment criteria agreed upon by all experts can be summarized as follows(7):

1. Respect the characteristics of the site.
2. Respect the internal environment for user comfort.
3. Energy efficiency.
- 4- Water use efficiency.
- 5 - Efficiency in the use of building materials.

First- Respect the characteristics of the site: This principle expresses the interaction and compatibility between the building and the site on which it is a key factor to achieve a successful compatible architecture and the main objective of this principle to enter the building of the ground in a way that does not make significant changes in the site even if removed site.

Second- Respect for the internal environment for user comfort: Respect for environment-friendly architecture must at the same time respect users to protect them from external conditions and at the same time provide them with an ideal environment for life. This criterion consists of several sub-criteria: Quality of interior design - Preventing and controlling indoor pollutants - Achieving thermal comfort - Achieving visual comfort - Achieving acoustic comfort - Achieving safety and security

Third- Energy Efficiency: The building should be designed and constructed in a manner that minimizes the need for fossil fuels and relies more on natural energies. The old buildings and heritage have understood and achieved this criterion to a large extent. This standard consists of several sub-criteria: - Reduce energy consumption - Eliminate air pollutants)

Fourth- Water use efficiency: When designing and constructing buildings, the consumption of potable water must be taken into consideration. The building should be based on rational water consumption and the possibility of reuse of gray water, especially in Arab countries, which are severely affected by the lack of potable water sources. This criterion consists of several sub-criteria: (General economic design of water consumption - Water systems and pollution prevention - Water efficiency in the building - Use of water meters to monitor water consumption - Gray water reuse)

Fifth- The efficiency of the use of building materials: The recycling of building materials protects the natural environment resources from depletion, and the design decisions of the resources used and the methods of construction reduce the negative impacts on the environment. This standard consists of several sub-criteria (reuse of building materials - Materials used - Waste management during construction and use

5 - vocabularys of architectural heritage that achieve the corresponding with environment:

5-1: Respect for the characteristics of the surrounding environment: Architecture considered that the design of the building is one of the most important stages of the building's compatibility with the surrounding environment, where the direction of the building and the formation of the appropriate environmental appropriate way of reducing the thermal loads on the building as well as access to the best ventilation and natural lighting

5-1-1 - The direction of the building: - The general direction of the building plays an effective role in the efficiency of heating, lighting and ventilation, so guidance in the direction of optimal ventilation and natural lighting, thus having a positive effect in the provision of energy consumed. Figure (1) shows the best orientation and the preferred direction during the summer and winter. Figure(2): Direction and distribution of spaces and functional relationships with environmental trends.

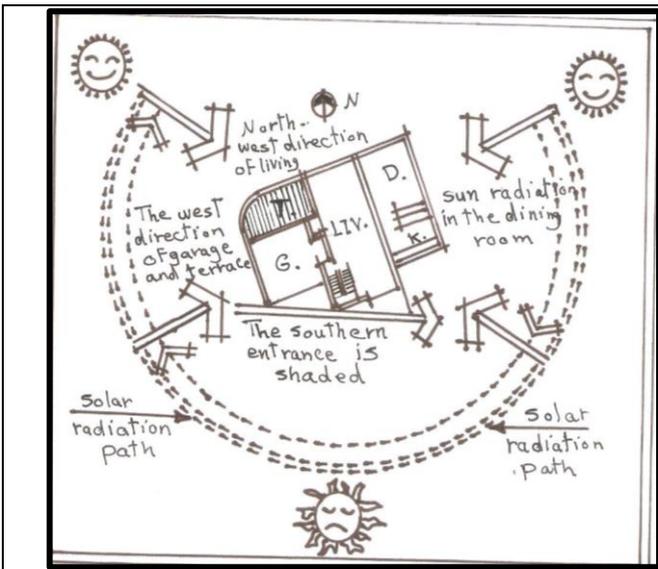


Figure (2) Direction and distribution of spaces and functional relationships with environmental trends (Source: 2)

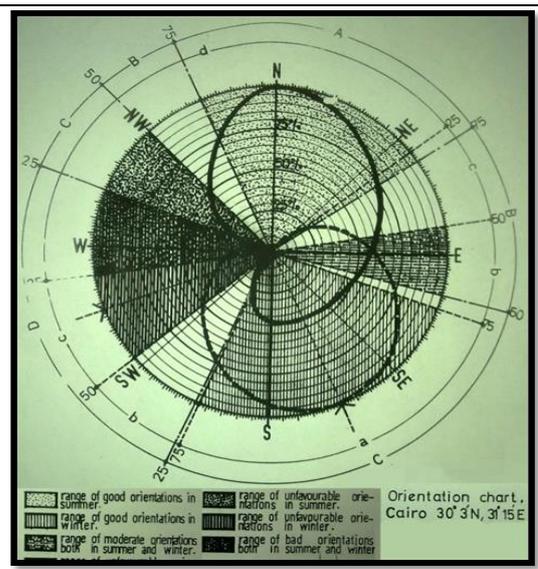


Figure 1 - Orientation Chart (Source 3)

5-1-2- The formation of the building block: The architect found that the optimal form of the building's fallout are the most central forms such as the circle and the square where the largest content and the least surface exposed to solar radiation, and with the mass of the mass and the work of an internal courtyard, for example, the flexibility of design increases(5). It was found that the optimal rate of elongation in dry hot areas is 1: 1.3, and this ratio can be increased to 1: 1.6 on both the eastern and western axis as shown in Figure (5).

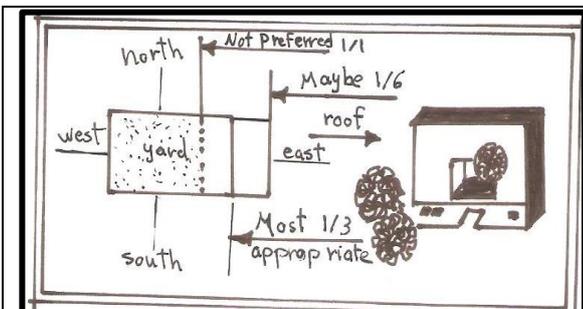


Figure (5) Best ratio of horizontal projection (Source: 6)

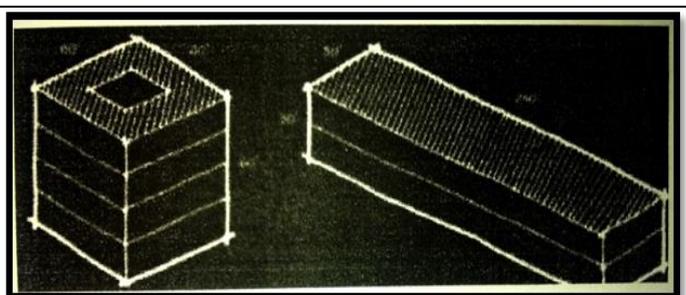


Figure (4) Roof area exposed to weather factors in longitudinal and cubic shape (Source: 5)

Thus, the designer today, when studying the direction of the building and the mass of the site during the design process, achieves the first criterion for the construction of the corresponding respect for the characteristics of the site.

5-2-Respect for the internal environment for the user's comfort: The exterior of the building is a link between the inside and outside, the amount of radiation falling on the surface is large due to the length of exposure to the sun and therefore the heat leaked through the inside is larger than the vertical walls. The openings are considered to be the main source of heat penetration inward for their thickness, and therefore their design should be considered in a way that reduces heat transfer to and from the vacuum to create a healthy and comfortable environment for the human and to reduce the burden of convection⁽¹⁾

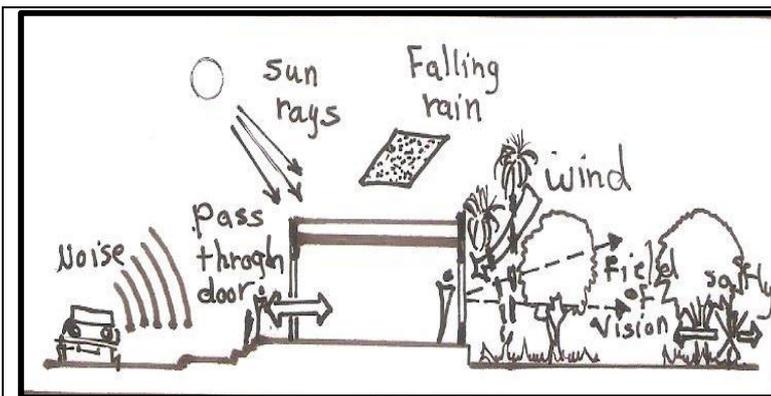


Figure (7): The most important elements and influences between the inside of the building and outside the building through its outer cover (Source: 1)

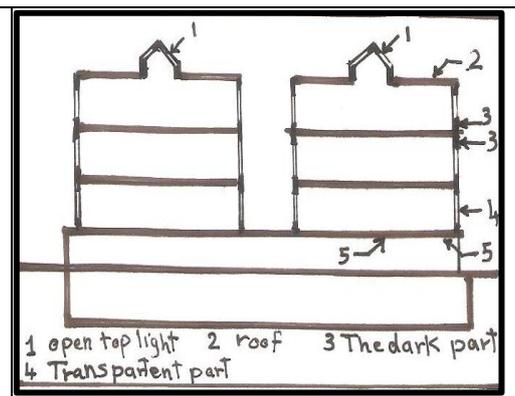


Figure (6): An explanatory section of the exterior casing elements of the building (Source: 16)

5-2-1. Roofs: Roof treatment plays a large role in hot climate to prevent sunlight from reaching the building block at daytime. There are several ways to design the roof of the building contribute to the achievement of thermal comfort, , Used in many areas in Egypt and it is a traditional vocabulary can be reused at the present time, including⁽⁵⁾:



مركز الحرف التقليدية في القسطاط الميني على الطراز المعماري الذي دشنته حسن فتحي

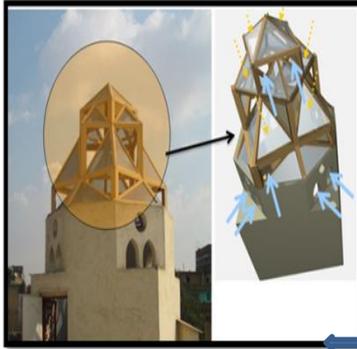
- **The use of curved forms of the roof:** The vaults are the most famous examples of curved roofs, which are widely used in the desert areas, the most prominent examples of Hassan Fathi. These ceilings also help to generate a high pressure area in the sun exposed area and a low pressure area in the shaded area of the ceiling, which helps the movement of air between the two areas, which helps to reduce the excessive heat on the ceiling, Hence this vocabulary provides thermal comfort.

← Figure (8) reflects the use of curved roofs (Source: 15)



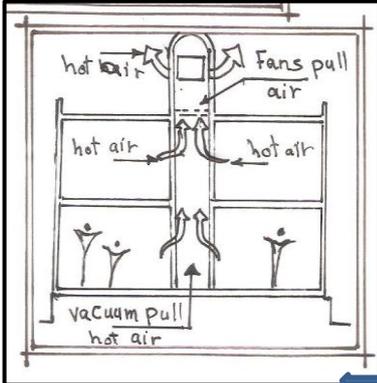
- **Lunar:** A roof of glass or plastic colored and used mainly to provide lighting for some areas without passing hot air into the house⁽⁶⁾. Thus achieving the quality of interior design and providing visual comfort.

← Figure (9) for lunar illumination (Source: 6)



- **Shakhshikha:** It is a stereotype and be either in the shape of a wooden dome or circular or polygonal or on the neck of a circular or hexagonal or eight. And used to cover the main halls and help to provide ventilation and lighting of the room above, and works with the Sanctuary to soften the temperature of the air and drag the hot air located at the top of the room and also helps to provide indirect overhead lighting(6). Figure. (10), Thus improving air quality in the internal environment and providing thermal comfort.

Figure. (10) Shakhshikha with a glass prism (Source: 6)



- **Solar chimney:** Solar chimney is a way to improve the natural ventilation in buildings using the convection of heated air from idle solar energy. The vertical solar chimney is preferred for vertical ease of air travel and is longer than allowing vertical elevation of hot air. The chimney is covered from top with porous wood or other covers to permeate the air, with water bottles or tubes filled with water to cool the air and thus reduce convection within the vacuum. As in Figure (11) . Thus improving air quality in the internal environment and providing thermal comfort.

Figure (11) Using Ducts to Ventilate Internal Spaces (Source: 1)

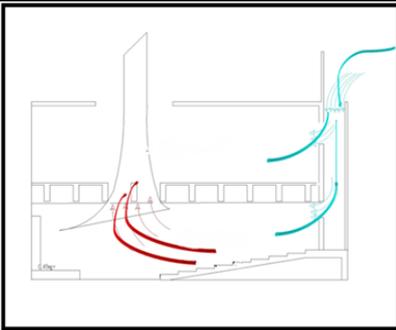


Figure (12) Using Ducts to Ventilate Internal Spaces (Source: 9)

5-2-2- Fenestration: The openings, including windows are the most important elements responsible for the transfer of heat into the spaces through the outer shell of the building, and in the form of doors or windows or openings for architectural formation. The openings in the hotspots are small openings and are supplied with solar breakers to reduce heat acquisition(5).



-**Mashrabiya:** One of the important methods of heritage treatments, regulates the entry of sunlight without causing dazzle or luster because of the details of the Arabesque component, which does not occur when a sharp refraction of light. It also allows visibility from the inside to the outside and not the opposite, providing both the look and the privacy, as shown in Figure(13). It also has a hole in the cell to place the small water tractor cooled by the evaporation caused by air moving through the hole, and consists of typical Mashrabiya of two parts:

A bottom part made of a narrow bar with a fine rod - a top part of a wide buckle with cylindrical wooden rods(8), And thus achieve security, safety and privacy in addition to achieving visual comfort and thermal comfort ideal to suit the reality of Egyptian and Arab.

Figure(13):The use of Mashrabiya for lighting homogeneity (Source: 5)



Upper openings: Upper openings are used to increase the flow of air and move it and get rid of hot air in the hot areas as well as increase the lighting area. It is a small openings used for ventilation and are mostly in the form of circles or polygons and located in the ceilings and domes and works on Dispose of the hot air collected at the ceiling area, allowing cold air to replace it as a source of ventilation for the population at home(8). The ventilation quality is thus achieved in the internal environment and provides thermal comfort.

Figure 14: Use of Mashrabiya for lighting homogenization (Source: 15)

5-2-3- Walls: Walls support the multiple functions of the outer shell of the building is to protect the interior spaces of the environment and the factors that are undesirable, in addition to a key role in the structural consolidation of the building and the division of internal spaces. External walls are exposed to thermal radiation, to reflected radiation from the earth's surface, walls of surrounding buildings, and convection from hot air near the Earth's surface(4).

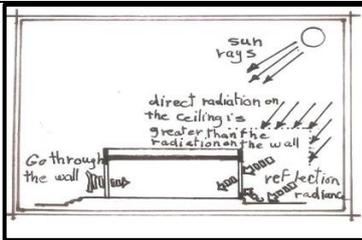


Figure (16) Solar radiation on walls and ceiling (Source: 4)

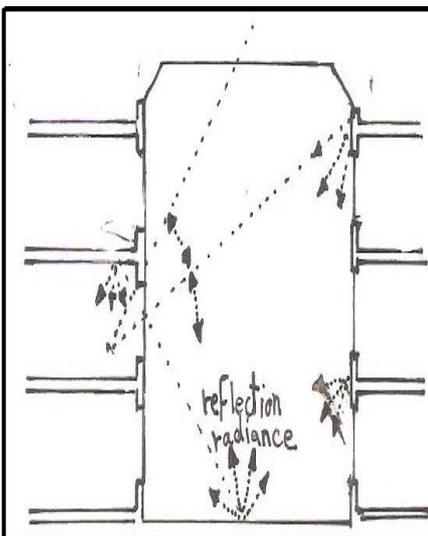


Figure (15) Bawaki (Source: 15)

Al-Bawaki: Through these gates, he produces cold shaded areas and produces pressure differentials (airless)

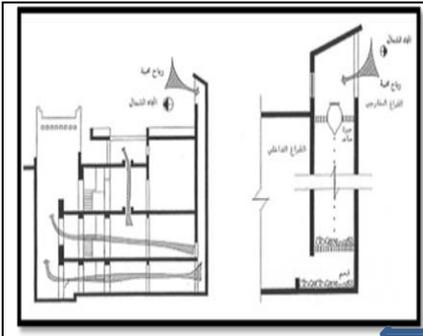
Thus, the designer today can, through the study of the traditional vocabulary used in the formation of the outer casing of the building achieves the second criterion is respect for the internal environment for the convenience of the user.

5-3- Energy Efficiency: The design process depends on the methods that do not need drilling fuel and rely on natural energies in providing thermal radiance and improving the quality of air and natural light through some elements heritage, including(5):



- inner courtyards Atrium: The internal courtyard is the system of Islamic architecture in the treatment of the warm environment and its use is useful in hot climates to obtain cooling of the interior spaces, Reducing fuel consumption and relying on natural energies in the ventilation process, The role of the interior can be summarized in achieving the following environmental dimensions: Minimizing the effect of heat and work to provide shade for the parts of the building Ventilation and natural lighting and modification of the humidity of the place, which has a positive effect in providing comfort to users - exploitation of water collected from rainwater in the irrigation of plant elements - reduce the high rates of carbon dioxide - and open all the spaces of living On the courtyard in the building so it must not be less than 25% - 40% of the total area of the building(8).

Figure 17 Lighting by the courtyard (Source: 11)



- **Cooling Towers:** The idea of the projectors to obtain a natural air stream for ventilation and cooling inside the building, the wind was passing through the water on a pot of pore pottery, which increases the coldness of this air and increase its density, and developed this simple idea to become Towers As shown in Figure 2-23, this idea has been developed to be reached by cooling towers by placing water sprinklers at the top of the tower and a small fan(8), Encouraging the use of renewable energy (wind energy).

Figure (18) Method of work of the projectors - sector - (Source: 15)



- **Biscuit:** is a floor area outside the roof used to sit between the inner courtyard and the back garden and the whole view of the inner courtyard and connects through what is known as Mashrabiya garden backyard and as the area of the back garden is larger than the courtyard and therefore more exposed to the sun so the air heats up quickly And rises to the top, which causes the moderate air cold to move from the yard to the back garden through the clap, leading to a mild breeze.

Form (19) Confusion - House of Suhaimi (Source: 5)

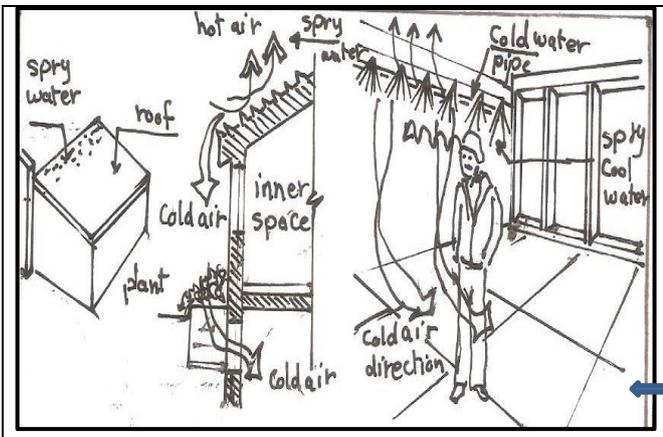


- **The seat:** A balcony located on the first floor of the residence and facing the prevailing winds and accessible through the inner courtyard through a direct staircase to climb to the seat and open front of the inner courtyard framed by a bow or brackets(5) , Achieve natural ventilation and reduce energy consumption

Figure (20) Seat - Beit Zeinab Khatoun (Source: 5)

The designer can now rely on some heritage vocabulary that reduces the use of non-renewable energy and thus eliminate air pollutants and this achieves the third criterion of environment-friendly structure is energy efficiency

5-4- water use efficiency: Water is used to reduce the thermal loads of the building and improve the quality of ventilation through:



-**The creation of water bodies next to the building:** help the water bodies next to the buildings to break the sun and fall on them and thus reduce the thermal load resulting therefrom, so as not to be the surface of water as a reflective surface of the building must be water rippled to lead to dispersion and break the sun, Fountains(1) are also in Figure (20).

Figure (20) Using water spray for summer cooling on walls and ceilings (Source: 1)

	<p>- Fountain: The fountain is placed in the middle of the yard of the house to mix the air with water and moisturize and then transfer to the interior spaces. This process causes the temperature to drop. It also acts as a noise barrier for noise. It produces a continuous low noise that draws the ear away from external noise(5). Thus achieving thermal and acoustic comfort through the reuse of water, but it is not water-saving.</p> <p>← Fig. (21): The fountain is placed in the middle of the courtyard (Source: 15)</p>
	<p>- Salsabil: is a crispy marble slab inspired by the movement of wind or water placed inside an alcove or an opening of the wall opposite the ion or sit position to allow the water to drip over its surface to facilitate evaporation and increase air moisture there and then flow water in a marble course until it reaches the position Fountain(5), Figure (22).</p> <p>← Figure (22) Salsabil - House of Suhaimi (Source: 5)</p>
	<p>- Drainage and roof garden: where the surface is cultivated to reduce the heat or the work of pools of water and fountains for moisturizing, especially in the hot areas and heritage buildings, and work is Darawi in the forms of hollow and wrinkled and light materials such as bricks and stone to empty the air and work to disrupt the movement of air on the roof of the building Cooling surfaces(5). It works to reuse gray water.</p> <p>← Figure (23) Plant element for water recycling (Source: 15)</p>

Thus, the designer today can use some of the heritage vocabulary that achieves the fourth criterion of the compatible structure is the efficiency of water use;

5-5- Efficiency in the use of building materials: The construction material affects the amount of thermal access between the outside and inside the vacuum. It is considered to be the best used material in Egypt. It is characterized by slow properties in the acquisition and penetration of heat between inside and outside. Thus achieving the protection of natural environmental resources from the energies and building materials that can be recycled when the buildings are demolished and thus they achieve the fifth criterion of the structure compatible with the efficiency of the use of building materials.

6- The relationship between the corresponding building standards and the group of architectural vocabularys that achieve the corresponding building standards:

Through the study of heritage vocabulary that has achieved compatibility with the environment in ancient times we can clarify the relationship between the criteria of evaluating the construction of the corresponding architectural heritage vocabulary through the following table:

Table (1): The relationship between the standards of evaluating the corresponding construction and the vocabulary of architectural heritage

Architectural Heritage Vocabulary																			Standards for the assessment of the corresponding construction		
The results of the realization of the heritage vocabulary for the corresponding construction standards	Building materials			Water as an element of design elements			Natural Energy Investment			External Cover						Design phase					
	The stone	clay	Burned brick	Drainage and roof garden	Fountain	Find the water bodies next to the building	seat	Altahtboh	Cooling towers and towers	Internal courts	Bawakey	walls	Age	The Mashrabiya	Solar chimney	Shakshika	Curved forms of roof	Building block formation			Orientation of the building
	15/19	*	*	*	*		*			*	*	*	*	*	*	*	*		*	*	Respect the characteristics of the site
19/19	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	Improve air quality in the internal environment	
11/19				*	*	*	*		*		*	*	*		*			*		Quality of interior design	
5/19	*	*	*						*		*									Preventing and controlling indoor pollutants	
19/19	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	Achieve thermal comfort	
8/19				*				*		*		*	*		*					Achieve visual comfort	
5/19	*	*	*						*		*									Achieving acoustic comfort	
10/19	*	*	*						*	*	*				*	*	*	*	*	Achieving safety and security	
13/19				*			*	*	*	*	*	*		*	*	*	*		*	Encouraging the use of renewable energy	
15/19	*	*	*	*			*	*		*	*	*		*	*	*	*		*	Reduce energy consumption	
2/19									*		*									Eliminate air pollutants	
-																				General economic design of water consumption	Efficient water use
-																				Ensure the existence of water systems and prevent contaminants	
-																				Water efficiency in the building	
-																				Use water meters to control water consumption	
2/19				*		*														Reuse of gray water	
2/19	*	*																		Reuse of building materials	Efficient use of building materials
4/19	*	*	*								*									Specifications of materials used	
3/19	*	*	*																	Waste management during construction and use	
10/19	10/19	9/19	8/19	3/19	5/19	5/19	5/19	5/19	11/19	5/19	11/19	7/19	5/19	5/19	8/19	5/19	5/19	6/19	The results of achieving the standards of buildings through the use of traditional vocabulary		

This Table represents the 19 elements of the criteria of the corresponding building assessment and 19 elements and columns elements of heritage heritage and the number of 19 elements and then display the results of the realization of the vocabulary of the standards of building compatible in a digital format shows the most important criteria that were able to address the heritage items in accordance with the environment, as well as the results of the achievement of building standards Through the use of vocabulary heritage to learn more of those words that have been able to old compatibility with the environment and can be invoked today in contemporary architecture as key elements of Egyptian architecture.

By analyzing the relationship of the elements of the previous table we can present the most important search results, which are as follows:

First, the heritage vocabulary was able to achieve the criteria of building consensus with the environment clearly:

The first criterion (respect for the characteristics of the site): - The design of the buildings achieved the thermal comfort of its inhabitants designed for them, and created a suitable environment with the specifications of temperature is the appropriate temperature and humidity as well as sufficient natural ventilation and achieved the quality of air required and achieved the appropriate lighting.

The second criterion (respect for the internal environment for user comfort): - Heritage vocabulary helped in the interaction of the building with the surrounding climatic factors and achieved the best thermal performance possible. The areas of hot conditions was relying on natural means through the design of the exterior of the building and created a comfortable internal atmosphere and was arranged in order Good for the openings and determine the size and space of the aperture and the appropriate orientation to introduce the greatest amount of air and proper lighting.

The third criterion (energy efficiency): - The design of the building was based on the use of heritage vocabulary in which the need for drilling fuel was reduced and more reliance on the natural energies and elements that collected hot air for heating. Store cold air at night to withstand extreme heat during the day.

The fourth criterion (water use efficiency): - Heritage vocabulary can not achieve the elements of this criterion in the narrow limits of water recycling in gardening.

The fifth criterion (efficiency in the use of building materials): - Heritage vocabulary can not achieve the elements of this criterion in the narrow limits of building materials.

Second: The most important vocabulary that has been able to achieve building standards compatible with the environment and we can rely on:

Pavements and walls: Check the access of light and air to the interior of the building and the interior of the rooms, and there are ponds and fountains to moisten the hot air and reduce the temperature, and the walls support the multiple functions of the outer shell of the building is the protection of the interior spaces of the surrounding environment and its elements As well as reduce the day-to-day temperature fluctuations in the building, achieve thermal comfort and acoustic comfort, and achieve safety, safety and pollution protection.

Building materials (clay and stone): The attention to local materials is very important because it does not require the exchange of any energy for production or transport, and these materials proved effective over the ages are considered the most appropriate materials from the environmental point of view, such as stones and bricks burnt and clay, Egypt, and these materials do not pollute the environment and do not need a large capacity to produce them but the minimum limits, and also helps the economic development of the country and contribute to the technological and environmental development of architectural spaces, and the use of such materials helps to keep pace with the world in environmental trends to reduce pollution.

Garden surface: Use the available natural resources and environmentally compatible to achieve human comfort and thermal use of water as a component in the natural environment, which works to reduce the temperature and works on recycling and use of water in the cultivation of surfaces, the plant element within the means of shading

Chakshikha: works to pull the hot air located in the top of the vacuum also provides indirect overhead illumination and reach to the maximum depth in the vacuum.

7- Conclusions and Recommendations:

First: Conclusions

- A proposed methodology towards the idea of compatibility with the environment and preservation of heritage:

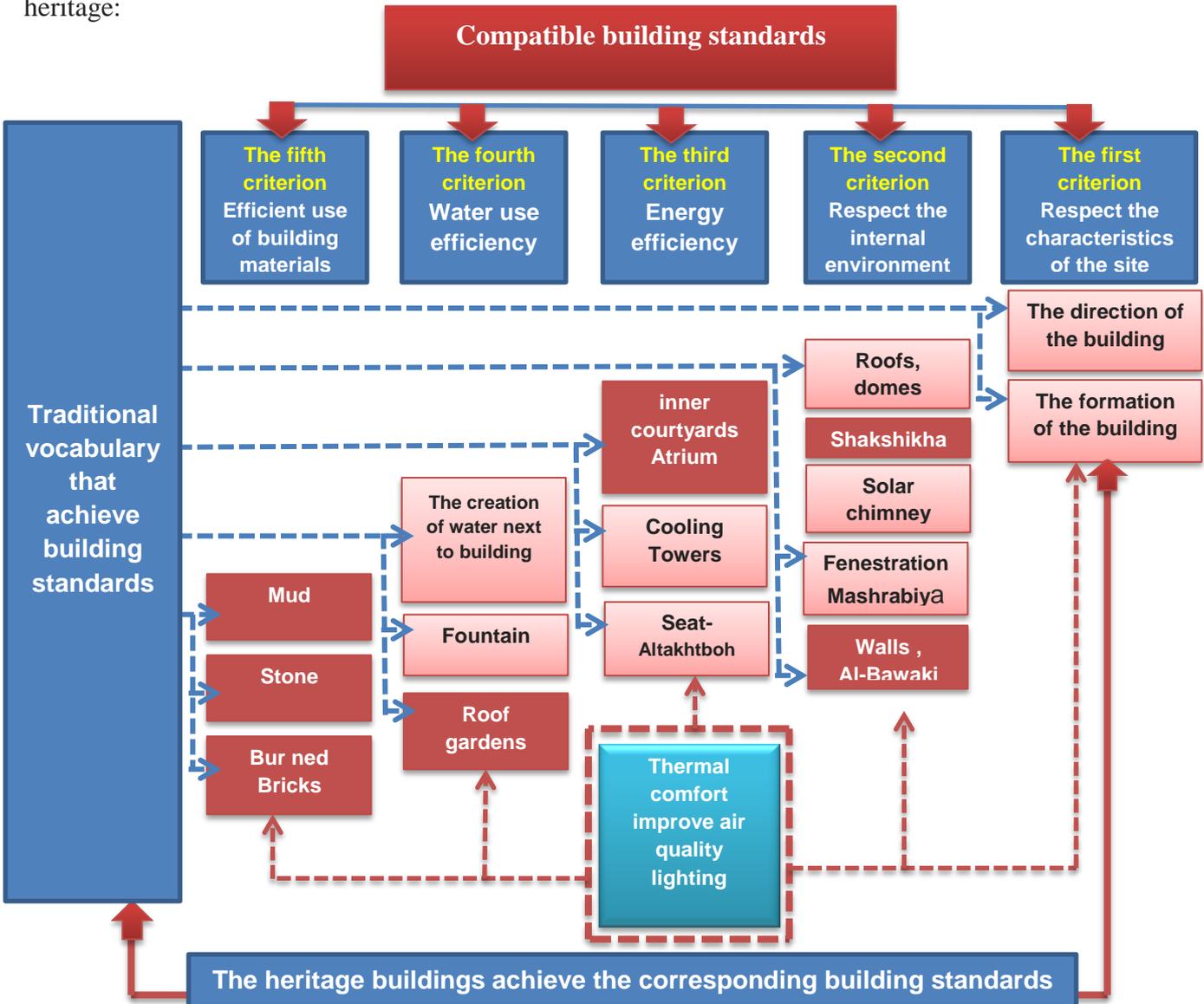


Figure (24): The relationship between the corresponding building standards and the group of architectural vocabulary that achieve the corresponding building standards

- The most important vocabulary that has been able to achieve the standards of construction compatible with the environment
- Traditional vocabulary that has not been able to meet building standards compatible with the environment

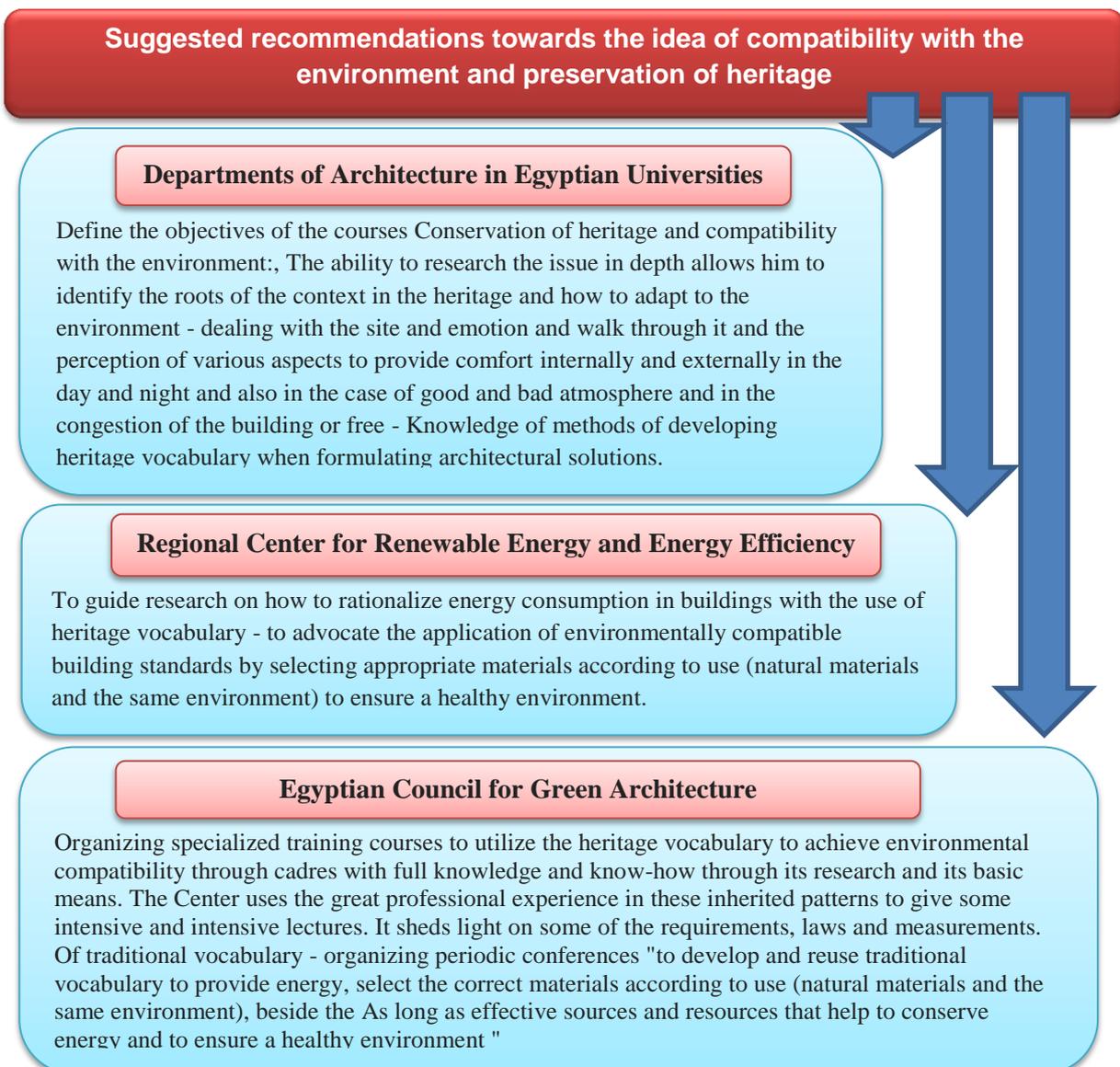
Second: Recommendations

1-Egypt Needs Environmentally Compatible Architecture:

All the daily phenomena and indicators confirm that the curve of energy consumption in all its forms is increasing as the modern buildings do not neglect the use of energy to operate them and adapt them to the needs of their residents. They are essential for lighting the buildings and operating the various electrical and mechanical equipment needed to serve them. ... in addition to the energy necessary to create the building for the comfort of its users and to achieve its basic function with the expected efficiency⁽¹²⁾.

In order to achieve this, it is necessary to create a suitable environment with the specifications of temperature is the appropriate temperature and humidity as well as sufficient natural ventilation pure to achieve the required air quality and to achieve the appropriate lighting, and to achieve this need to use some of the vocabulary of heritage that has achieved compatibility with the environment.

2-By studying the relationship between the traditional vocabularys and the corresponding structures and the initiatives to support environmental architecture, there are sets of recommendations that can be directed to the organizations.



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