

## Sustainable Architecture as a Concept of Rationalizing Consumption and Improving the Environment

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### Abstract:

The interest in the environment and its problems increased as adversely affects current and future generations, especially with regard to the energy field, which prompted the world to search for solutions to eliminate these problems and find common values between sustainable development and energy. Based on reconciling the concepts of development, energy rationalization, and a green environment to reach environmental sustainability.

The pioneers of sustainability in environmental architecture, and many academic and professional organizations, have worked hard on developing the means of achieving sustainability and applying them to modern buildings, leading to the concept of sustainable architecture.

This has led to the development of a societal view towards the internal and external environment of Egyptian homes from being architectural facilities for housing only. In order to develop them into entities with environmental, economic and social responsibility. All of this requires a deeper development of the role of studies towards identifying elements for improving the environment from the design, economic and social side for energy-efficient buildings.

The interaction of human beings with the environmental components has led to the depletion of their natural resources. In view of the tremendous development in information technology and the changing concepts of space, time and human relations. Therefore, it has become necessary to develop the concepts of architecture in accordance with the expected future changes, as happened in the era of modernity and the period of postmodernism leading to superior modernity, and future thinking in Sustainable environmental designs.

By applying the concepts of sustainable architecture through design practices in the building industry, it cannot be possible made by qualified designers in this field, which will lead to finding appropriate solutions to environmental, economic and functional problems. The concept of environmental design linked to exploiting the components of the natural and geographical environment to obtain the necessary energy, to provide a comfortable environment for housing, while protecting the environment, preserving its natural properties, and resorting to new sources of energy.

The traditional residence is a good example of applying sustainable design concepts in terms of design principle, building materials and environmental treatments, as it relied on exploiting natural energy sources such as sun, wind, topography of the site, to provide a comfortable interior environment, and to align it with social values and customs and traditions of society.

**Key words.**

Sustainable Architecture, building architecture, rationalization of consumption, environmental improvement, Household products.

**Research problem**

The spread of urban societies in Egypt has led to a boom in modern architecture due to the availability of capital flows. However, there are limited studies on buildings that support the idea of rationalizing consumption, and improving the environment. In order to achieve harmony between the positive aspects of modern buildings and the natural, social, and heritage environment, in terms of form and composition Structural structure and Ecosystems.

**Research importance**

The importance of this study lies in determining the elements and vocabulary of improving the environment from the design, economic and social side of energy-saving buildings as an environmental trend towards developing the scope of smart architecture in Egypt to support rationalization of consumption and improve the quality of environmental services, and uphold the values of social responsibility of designers.

**Research objective.**

The research aims to study the concepts of sustainability and its relationship to environmental culture and ways to benefit from it in improving the characteristics and standards of Egyptian homes economically, climatically, socially and culturally as a principle to rationalize consumption and improve the environment to support the application of environmental accounting in urban communities.

**Assumption of research**

The research assumes that by specifying the standards and specifications supporting the architecture of energy-saving buildings. In order to rationalize consumption and improve the environment through reliance on natural energy sources, and by applying modern sustainable intellectual trends in architecture. The architecture creates its own energy by achieving integration between technologies, materials and construction processes in building designs to reduce the use of energy and a sustainable urban environment.

**1- Previous studies****2- Main themes of sustainability**

Through previous studies, there are three main dimensions of sustainable development, interconnected and intertwined in the context of an interaction characterized by exact and rationalization of resources. (ElTahan: 2014), (Tunisi: 2017).

However, the researchers added extra dimensions as a main support to the main dimensions of sustainability. Those dimensions are the economic dimension, the social dimension and the environmental dimension.

### **3- Requirements to rationalize consumption and improve the environment**

#### **3-1- The living requirements inside the house**

The beginnings of adopting the concept of sustainability in the urban sector are not different from the beginnings that led to the emergence and adoption of the concept of sustainable development with its interrelated environmental, economic and social dimensions. The world has begun to recognize the link between economic and environmental development. Specialists have confined traditional forms of economic development in order to over the exploitation of natural resources, and create great pressure on the environment with its harmful pollutants and residues.

3/1/1- Living space.

+ Ventilation.

+ Lighting.

+ Air conditioning.

+ Thermal comfort.

+ Noise control.

+ Energy management.

3/1/2- Housing dynamics.

3/1/3- Multi-purpose furniture.

3/1/4 - Household products.

#### **3-2- Life requirements around the house.**

3/2/1 - The Eco mimicry.

3/2/2 - Cradle to cradle strategy.

3/2/3- Design for the environment.

3/2/4 -Design for disassembly.

3/2/5- Products Life Cycle.

3/2/6 -The environmental impact.

3/2/7 -Design for recycling.

3/2/8 - Designing for reuse, recycling.

3/2/9 - Energy saving, using renewable energies.

3/2/10 - Biological fermenters.

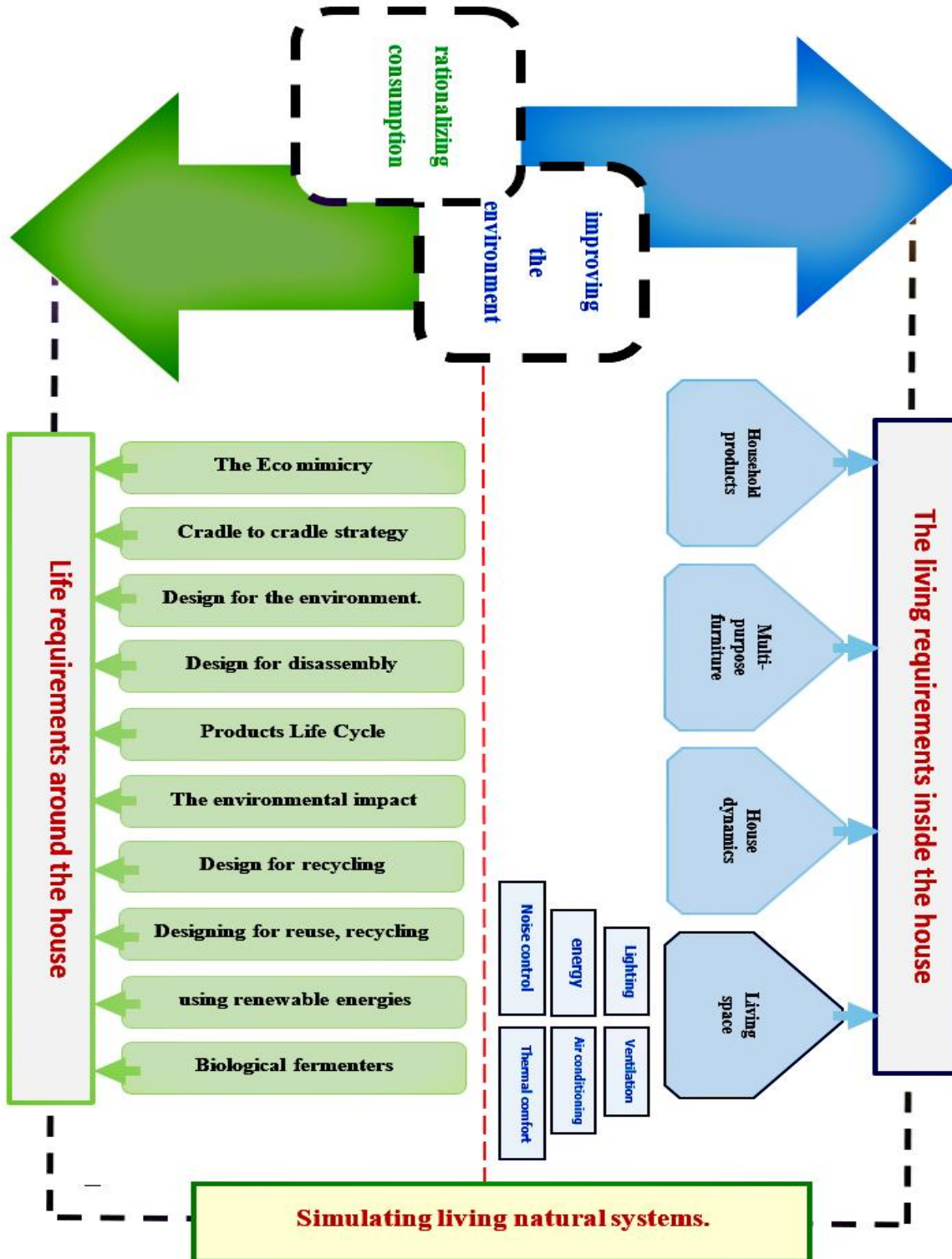


Figure: Clarifies the requirements of rationalizing consumption and improving the environment.  
Source: researchers

### 3/3- Simulating living natural systems.

It is a process of imitating or simulating nature known as biomimetic (designs inspired by biology). In order to inspire multiple solutions to the needs of successive generations that involve finding solutions to design problems. (Ali: 2012).

Nature is considered the first source and mentor from which the designer draws through the times innovative design solutions of symbols, elements and vocabulary in light of what nature possesses resources characterized by diversity, balance and symmetry with its formations, color combinations, etc.

The following figure shows a picture of an integrated environmental system that takes into consideration all desired environmental requirements, for the shape and function of the house required for environmental use. Also takes into account the rationalization of energy using solar energy, in addition to the use of various natural materials that can be recycled in the future, which do not cause any damage to the environment.



**Figure:** Shows a picture of a house that takes into consideration all the environmental aspects required to achieve rationalization in consumption and improve environmental quality.

Source: internet website

## 4- Results, Recommendations and References

### 4/1- Results.

The search results are as follows:

- The environmental design supports the exploitation of the components of the natural and geographical environment to obtain the energy necessary to rationalize consumption, and provide housing facilities that support the improvement of the environment in terms of design, social, environmental and economic aspects.
- The traditional dwelling is a good example for applying the concepts of sustainable design in terms of design principle, building materials and environmental treatments, and the exploitation of natural energy sources such as sun, wind, topography of the site, in order to provide a good environment compatible with the social values of society.

- The research seeks an integrated picture of an environmental building. So that it works as an integrated system that takes into consideration all the desired environmental, economic and social requirements, and supports the rationalization of energy consumption and the improvement of the environment using various natural raw materials that can be recycled in the future to reduce the environmental harm.

#### **4/2- Recommendations.**

The research recommends the following:

- The Egyptian government needs to adopt sustainable future thought in the urban expansion in new cities, that the state supports expansion in its establishment, which works to rationalize consumption and improve the environment to support the Egyptian economy.
- The need to expand the study of structural and structural systems in nature as well as the behavior of natural organisms as a primary source of information for inspiration so that it can be employed in both the field of environmental design and the field of industrial design.
- Activating the role of the industrial designer and the interior designer in the direction towards a sustainable environment to reduce the harmful environmental impact on the natural environment to achieve comprehensive quality in environmental, economic and social trends.

#### **4/3- References**

##### **4/3/1- Arabic references.**

- 1- Ahmed, Sayed Abdo (dr.), and others** (2018), "Design for recycling as an environmental requirement in product design", Journal of Architecture, Arts and Humanities, Cairo, Volume III, Eleventh Issue, Part Two, pages ( 708-742).
- 2- El-Hadidy, Haitham Ibrahim, El-Gohary, Mohamed Murtada, Shawky, Alamir Ahmed** (2019): "The courses of the faculty of applied arts and its relation to the idea of entrepreneurship as an entrance to entrepreneurial university, case study in the departments of (Industrial Design - Ceramics - Interior Design)" Arts and Humanities, Volume V, Number Twenty, pages 635-653.
- 3- Al-Helou, Majed Ragheb** (2002): "Environmental Protection Law in the Light of Sharia", Ma'arif Foundation, Alexandria, p. 31.
- 4- Al-Rifi, Aida Ismail** (1999): "The Role of the Designer in Achieving Product Quality", Journal of Science and Arts, Studies and Research, Volume 11, No. 3, Helwan University, Cairo, pp. 99-110.
- 5-Al-Zubaidi, Maha Sabah-Shaheen, Bahjat Rashad** (2008): "Principles of Sustainability in Traditional Architecture according to Islamic Perspective", Architecture, College of Engineering, University of Baghdad, Iraqi Journal of Architecture, Vol. 4, p. 12-13, pp. 74-91.
- 6- Al-Tahhan, Lawrence** (2014): "Applying green architecture standards to existing buildings from 1950 to 1970", case study (Baghdad Street), Damascus University, Faculty of Architecture, Department of Building and Implementation Sciences, Syria.
- 7- Tunisian, Amna - Bornnan, Ibrahim** (2017): "The role of environmental culture in supporting the application of environmental accounting in light of the requirements of sustainable development", (the case of the Sonatrach company), Journal of Studies and

Research, The Arab Journal in Humanities and Social Sciences, ISSN: 975-1112, ninth year, number 27.

**8- Raafat, Ali** (2007): Solasyat al abdaa – al abdaa al fekry – Emarat al mostaqbal – algozaa al khamis, p 73.

**9- Abdul Rahman, Doaa - Al-Najadi, Ali, and others** (2019 AD): “The concept of sustainable design and its impact on the quality of the interior environment for interior design”, The Arab Journal of Civilization and Islamic Arts, Cairo, Volume IV, Fifteenth Issue, pages 185-200, p. 189.

**10- Abdel-Ghani, Hassouna** (2013 AD): “Legal protection of the environment in the context of sustainable development”, published doctoral dissertation, Faculty of Law and Political Science, University of Mohamed Khodeir, Biskra, Ministry of Higher Education, Algeria.

**11- Abd ElMaqsood, Zain Al-Din** (1998 AD): Contemporary Environmental Issues, Confrontation and Reconciliation between Man and His Environment, Second Edition, Scientific Research House, Kuwait, p. 17.

**12- Ali, Donya Hameed** (2012 AD): “Simulating Natural Systems in Urban Sustainability Decisions”, College of Engineering, Baghdad University - Ministry of Construction, Housing and Municipalities, Engineering Construction Department, Republic of Iraq.

**13- Salim, Haitham Sadiq** (2011 AD): “The architecture of globalization in Egypt and the absence of concepts of sustainability in design - a case study of administrative buildings in New Cairo”, Engineering Journal, Faculty of Engineering, Al-Azhar University, Cairo.

**14- Fahmy, Dalia Khaled** (2018): “Considerations for realizing a sustainable concept in the field of industrial design”, Architecture and Arts Magazine, Cairo, Volume III, Eleventh Issue, Part One, pages 217-237.

**15- Yassin, Adel** (2010 AD): “Green Architecture”, Supreme Council of Culture, General Authority of the National Books and Documentation House, Cairo, deposit number 20266 / 2019AD, pp. 20-80.

#### **4/3/2- English references.**

**16- Marshall, Alan** (2007): “The theory and practice of Ecomimicry”, Sustaining Gondwana issue3, Curtin University, Australia.

**17- Hillier, Bill** (2007): "Space is the Machine", A configurational theory of architecture, Space Syntax, London E1 5LN, ISBN 978-0-9556224-0-3, United Kingdom.

**18- James Wines, edited by Philip Jodidio**, (2000): “Green Architecture”, Taschen; Köln, Germany. Paperback.

**19- Mclennan, Jason F.** (2004): The Philosophy of Sustainable Design – Ecotone – Kansas City Missouri -p 4.

#### **Internet web sites.**

- [https://ranem2019.blogspot.com/2019/02/blog-post\\_18.html](https://ranem2019.blogspot.com/2019/02/blog-post_18.html)- 2/4/2020- 11PM.
- <https://arabpsychology.com/hierarchy-needs-theory.pdf>
- <https://www.google.com/search?Maslo>. 1/4/2020- 11pm.
- <https://www.amazon.com/Green-Architecture-Philip-Jodidio/dp/3836503212>.
- <http://www.thwink.org/sustain/glossary/Sustainability.htm#WhyFlawed>.2/4/2020-11pm.

- [http://buddhajeans.com/encyclopedia/design-for-disassembly-diagram/.3/4/2020-6pm.](http://buddhajeans.com/encyclopedia/design-for-disassembly-diagram/.3/4/2020-6pm)
- [http://buddhajeans.com/encyclopedia/ecological-footprints-illustration/.3/4/2020-8pm.](http://buddhajeans.com/encyclopedia/ecological-footprints-illustration/.3/4/2020-8pm)
- [https://www.nippon.com/ar/features/h10031/-4/4/2020-10pm.](https://www.nippon.com/ar/features/h10031/-4/4/2020-10pm)
- [http://kawngroup.com/bio-digester/-10/4/2020-6am.](http://kawngroup.com/bio-digester/-10/4/2020-6am)