

CONTRIBUTIONS OF RESIDENTIAL LANDSCAPE DESIGN TO ECO-HOUSES

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ABSTRACT

In recent years, uncontrolled growth of world population and therewith unconscious growing has led to deterioration of plans designed in city establishments. As well as the many difficulties we face in urban, especially with 1950 s, environmental problems reveal the need of ecological approaches.

Ecology as a concept firstly is used by Ernest Haeckel in 1869. When it is considered in urban scale, in the matter of generating rational solutions with two-way; deduction, and induction methods, has been a concept rediscovered by people. Along with this concept; cities, have been striving against with different types of problem within itself, will be attempt to gain to nature. Because of the ignorance in land use; inadequate land use of necessary points and unnecessary land use in unnecessary points lead to be done in landscape planning for residential environments too. It is known that, so many methods can be produced in residential landscape design. For instance; logical and active use of wind shelters and solar shelters in landscape design, can provide %25 energy saving. Apart from that, selected and located trees can provide welcome shade whilst providing for solar access in the winter. Also, deciduous climbing plants on south facing walls, provide shade in summer whilst allowing unimpeded solar access in winter, whilst green roofs can also keep houses cool through intercepting solar energy.

The aim of the study is to defend “right ecological solutions for landscape planning will provide energy saving in eco-houses and so contribute sustainability in cities”. The deductive method was adopted for this study. Firstly, the definitions of ecology and sustainability will be expressed with their role in cities to understand the need of eco-houses for sustainability in cities. After that, will be focalized on the landscape design for eco-houses. For this purpose; at the end of the study, landscape design decisions and methods for eco- houses will be defined, the hypothesis which put forward at the beginning of the study will be supported.

Key words: Ecology, sustainability, Eco- houses, residential landscape design for eco-houses.

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1. INTRODUCTION

In recent years, the population of cities and urbanization increase in a significant at a furious pace. Industry, commerce and education opportunities at some places in cities make them more attractive for people (Gül and Polat 2009). The existence of social and cultural spaces in urban, differentiation and development in economical sense are making these places more preferable to rural.

Though this accelerated and uncontrolled changes are getting more threats for nature and human health. Natural resources are consuming; air, water and soil pollution are increasing etc. Therefore, these problems and more should be solved by government and the local administrations by the help of citizens.

Existent cities are resuming their negative affairs and becoming “nature enemy cities” day by day, but this process reminds the term “ecology” that has been forgotten by human because of the defective politics.

“Ecology” first is used by Ernest Haeckel in 1869. It is derived from “oikos” which is meaning “home” in Greek. Ecology means “home for living organisms” (Begon et al. 1990). When it is considered in urban scale, it’s been a rediscovered term for humanity on produce logical solutions with deductive and inductive methods.

Holistic approach should be adopted for the solution of ecological problems in cities. From the smallest scale-houses to the largest scale - cities should be thought and an urban ecology should be aimed.

Especially, the rapidly rising developments in industry and technology in cities by 1950s; bring along an uncontrollable immigration from rural to urban. Because of this intensity in cities, disequilibrium has begun in land use. In consequence, landscape use in houses has being decreased even it has finished in many places.

After all these negativeness, new concepts have been discovered. “Sustainability” is one of these concepts which become a significant term for human. Sustainability proposes a new lifestyle to human for preserving natural resources in this planet. by the help of ecologic methods.

Firstly, in small scale, these protections begin from houses. From this point of view, a new term “eco- houses” has been found. In this study will be investigated the effects of residential landscaping to eco- houses. And different natural methods will be suggested for landscape planning for eco- houses.

2. THE RELATION BETWEEN “ECOLOGY” AND “SUSTAINABILITY”

2.1. Ecology and Ecological Approach in Cities

Sustainability and ecology in the existing urban areas of the city's approach to integrating all the components, that and policies in the context of integrated urban management, urban planning and design of the institutional / social and individual responsibility and the scale must be resolved (Gül and Polat 2009).

In ecological approach, multifaceted methods are required. To increase the intensity of natural and green spaces, clean energy use, the use of environmentally -friendly technology, ecological-based urban, spatial and architectural planning and design of structures, on ecology and environmental protection education (information and

awareness) activities, ecological transport solutions, supervision and monitoring, promoting savings, environmentally friendly and harmonious use of materials are some of these methods (Gül and Polat 2009).

For all and more than these methods of ecology are based on some principles. These are:

- Nature integrity principle
- Nature limitation principle
- Nature self- audit principle
- Nature variety principle
- Nothing is disappear in nature

2.2. Sustainability and Sustainable Approaches for Cities

The majority of people worldwide live in cities and towns. By so many different reasons, their numbers are continuing to increase. Cities and towns offer an attractive living environment for the majority of people, but more knowledge is needed about the dynamics of this man- made environment, i.e. about the extremely changed natural conditions and about urban areas as living space. With increased urbanization worldwide, an urban perspective is progressively needed to understand human – nature integrations to improve research, design, planning and management of cities, towns and urban regions (Breuste and Qureshi 2011).

Sustainability was found out in the World Commission on Environment and Development report (Brundlandt Report). The definition of sustainability (1987) according to this report is: “Sustainable Development is to ensure that humanity meets the needs of the present without compromising the ability of future generations to meet their own needs.”

Along with decrease use in resources, the limitation in fossil energy use, the controlling of pestilent wastes of sustainable houses, increasing of use clean energy resources are bring new initiatives to design.

3. ECO- HOUSES

3.1. Contribution of Eco-Houses to Sustainability in Cities

Ecological houses are the houses that can be adapted to take environmental effects of domestic life into consideration, have been put forward as a crucial site and instrument of environmental citizenship (Hinchliffe 1997).

Whole of the countries in the world are making an effort for saving their own resources. For instance, UK government is attempted to cutting greenhouse gas emissions by 80% by 2050 in a bid to succeed climate change. Dwellings in the UK account for approximately 27% of the UK total of carbon dioxide emissions through the burning of fossil fuel for heating, lights and appliances. This includes combustion on the premises, mainly natural gas for heating and cooking, and combustion in power stations to produce electricity for homes. In order to address the climate change contribution from the domestic sector, the UK government has stated that every new home needs to be zero-carbon by 2016. As it is seen below, not only for keeping energy and also for producing and converting whole of

recourses; eco- houses are the essential potential for sustainable cities (Gillott and Rodrigues, L and Spataru 2010).

3.2. Contributions and Methods of Residential Landscape Design for Eco-Houses

Landscape design strategies for residential houses are additional and purposeful methods for energy efficiency in eco-houses. Logical and methodological planning process brings along minimum energy consumption in eco-houses.

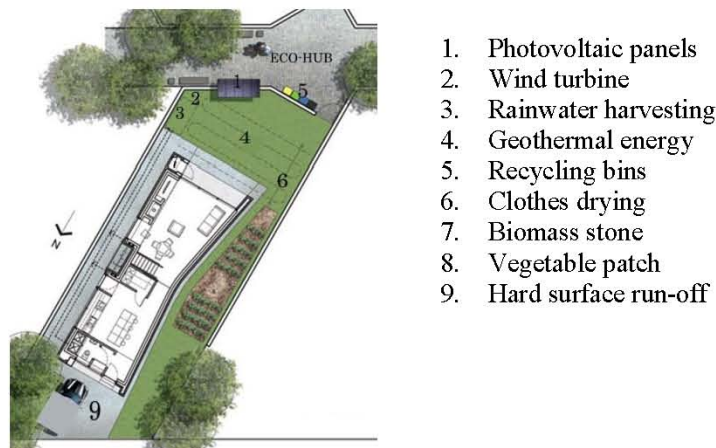


Figure 1. Some ecologic methods of residential landscape

-Bio-filtering of wastes through constructed wetlands, reduction of stormwater, run-off through the use of bio-swales, rain gardens and green roofs and walls use can provide water- saving. And using water from showers and sinks, known as gray water can be used for landscape irrigation in eco-houses.

-Xeriscaping: It is a new term that is used for reduction of water use in landscapes through design of water-wise garden techniques.

-Permeable paving materials to reduce stormwater run-off and allow rain water to infiltrate into the ground and replenish groundwater rather than run into surface water. Also, landscape products such as paving stones, mulch and other materials in landscape projects can be created from recycling products; such as glass, rubber from tires and other materials. Use of sustainably harvested wood, composite wood products for decking and other landscape projects, should be preferred instead of plastic.

-Soil management techniques, including composting kitchen and yard wastes, to maintain and enhance healthy soil that supports a diversity of soil life

-Instead of spend electricity in landscape lighting, integrated and adopted of renewable energy, including solar-powered should be used.

-A local plant, which has adapted to local climate conditions, will require less work on the part of some other agent to flourish. And by choosing the right kind of local

plants, a great deal of money can be saved on amendment costs, pest control and watering.

-Plants used as windbreaks can save up to 30% on heating costs in winter. They also help with shading a residence in summer. A dense vegetative fence composed of evergreens (e.g. conifers) near that side from which cold continental winds blow (usually north in the N. hemisphere) and also that side from which the prevailing winds blow (west in temperate regions of both hemispheres). Calculations show that placing the windbreak at a distance twice the height of the trees can reduce the wind velocity by 75%.

-Plants release water vapor in the air through transpiration and water has the ability to reduce temperature extremes in the areas near it. The larger and more leafy the plant, the most water vapor it produces. Additionally, as a principle for permaculture, the presence of trees is crucial in the creation of stable, healthy and productive ecosystems.

-For providing direct energy conservation should be placed broadleaf deciduous trees near the east, west and optionally north-facing walls of the house. It provides shading in the summer while permitting large amounts of heat-carrying solar radiation to strike the house in the winter.

(http://en.wikipedia.org/wiki/Sustainable_landscaping).



Figure 2. Gray water use in landscape irrigation

Figure 3. Plant location for energy saving in eco-houses

Figure 4. Sample of xeriscape use for residential landscape

4. CONCLUSION

Improved socio-cultural life and variety in means of existence, make cities attractive for living. Gradually; cities have been exposed to increasing in population and losing their previous silhouette. Thereby cities are becoming to transform “building masses” which are stylistically bereft of character. Whereas in 1911 Le Corbuiser could not hide his admire and said “if we compare New York and Istanbul now, we can say that the first one is a hell and the second is a heaven in planet”. These words reveal changes to bad in cities clearly.

Besides of aesthetic losses, cities are beginning to be a threat for human and nature. Natural resources are being polluted, with the aim of serving to this crowd population, a lot of natural production is relinquishing to artificial one.

Human has been living this negativeness in his health and searching for solutions. Thus, it is gradually rising to seek for natural in modern world that might be defined as “return to past”. Is being developed methods to provide sustainability for the world with ecological approaches.

“Eco- houses” are residential houses which are designed to preserve natural resources and provide energy saving. With the aim of increasing efficiency in systems to conserve energy, residential landscape design should be planned consciously. In the context of this research, residential landscape applications are examined in detail, necessitate a precise design and application progress. By this means, can be built energy efficient and nature- friendly residential houses that have very few operational costs.

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