

Sustainable Urban Landscape Practices: A New Concept to Reduce Ecological Degradation.

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Abstract - Urbanization is an inevitable process of development of human society and an outcome of economic development and scientific and technological progress. While urbanization process in promoting the development of human civilization, also no doubt, urban landscape has been a corresponding impact. Urban environment has suffered unprecedented damage majorly due to the increase in urban population density and heavy migration rate, traffic congestion and environmental pollution. All this have however led to a major ecological degradation and imbalance. As lands are used for the rapid and unplanned urbanization, the green lands are diminished and severe pollution is created by waste products. Plastic, the most alarming waste at landfill sites, is yet uncontrolled. Therefore, initiatives must be taken to reduce plastic mediated pollution and increase green application. However, increasing green land is not possible due to the landfill by urban structures.

In order to create a harmonious environment, sustainable development in the urban landscape becomes a matter of prime focus. This paper thus discusses the concept of ecological design combined with the urban landscape design, green landscape design on urban structures and sustainable development through the use of recyclable waste materials which is also a low costing approach of urban landscape design.

Index Terms— sustainable, urban, landscape, ecological balance.

1. INTRODUCTION

Landscape embodies human outlook, values, ethics and moral and reflects peoples love and hate, desire and dreams in the land. Today, landscape has become an indispensable part of contemporary urban life. From the perspective of modern people, we are supposed to protect environment in accordance with the laws of ecology in order to ensure sustainable development.

With the rapid development of mankind and urbanization, landscape structures of cities have been affected accordingly. City environment suffers unprecedented hazards, such as air pollution, shortage of water resources, high population density, urban traffic congestion, shortage of resources and so on.

Architecture is always in a dilemma when it tries to achieve the double objectives of creating its own value and manifesting the harmonious with the city as well. Nowadays, in the face of problems caused by the process of urbanism, such as destruction of ecology, loss of cultural characteristics, fragmentation of urban tissue, contemporary architecture has been strongly influenced by the concepts and methods of landscape, which give another possibility beyond the dualism

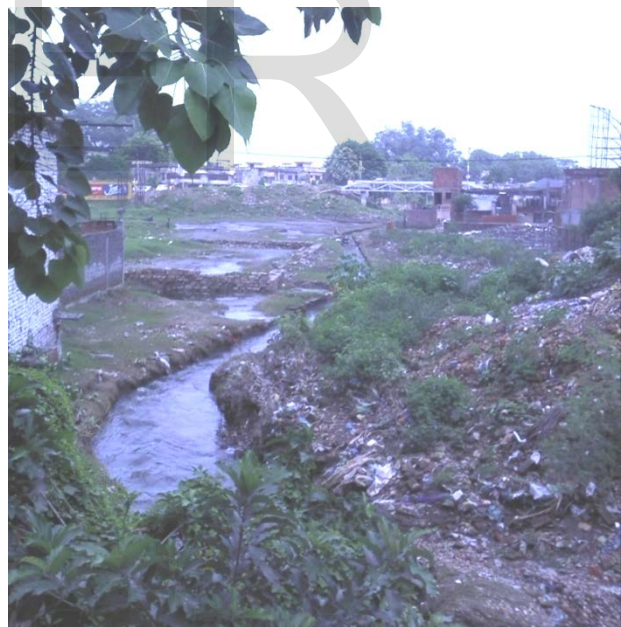


FIG1. DEGRADATION IN THE NATURAL URBAN LANDSCAPE DUE TO POLLUTION.

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relation between architecture and urban, man and nature.

2.0 THE RELATED CONCEPTS

2.1 Sustainability and environment

Sustainable planning and design focus on promoting recycling and achieving an ecological balance. It majorly talks about designing nature in a very natural way.

Sim Vander Ryn and Stuart Cown first proposed the definition of ecological design: any coordination with the ecological processes, as far as possible damage to the environment of their reach minimal design in the form, is referred to as eco-design.

This coordination means that the design respects species diversity, reduce the deprivation of resources, maintaining nutrition and water circulation to maintain plant and animal habitats, habitat quality, and help improve the living environment and the health of ecosystems.

Ecological planning and design follow the 4R principle - reduction (reduction), re-use (reuse), recycling (recycle), renewable (renewable).



FIG2. HEAP OF URBAN WASTE ALL AROUND THE GHATS OF VARANASI.

2.2 Ecology and environment

Sustainable development aims at meeting current needs without compromising the ability of future generations meeting their development needs. Sustainable development also means the maintenance, rational use and improvement of the natural resource base which supports the pressure resistance of ecological basis and economic growth. The sustainable design is essentially a regenerated design based on a self-renewal capacity of natural systems, including how to interfere and destroy the self-regenerative capacity of natural systems as little as possible, how to enhance the regeneration capacity of damaged landscape as much as possible, and how to minimize a design by means of maximizing the natural regeneration capacity. These lead to a sustainable landscape.

2.3 Eco-city: an integrated concept

Roseland argues that the eco-city is a particular structure consisted by numerous seemingly unrelated elements, including urban design, lifestyle, economic improvement, physical environment, popularity, and social system [xi]. It is an important argument of Yu that an eco-city should be a process of delivering integrated social, economic and environmental development [xiii]. More specifically, Song describes six fundamental principles of establishing ecological city, including sustainability concept; individuals as priority; being harmony with economy, society and environment; emphasizing healthy economic environment; stimulating innovation and overall planning [xii]. These views show that the eco-city concept integrates culture, natural and social-economy into a whole development approach.

Currently, climate change is the major challenge to an eco-friendly environmental establishment. Because of the extreme weather, the energy shortage and overutilization of raw materials, the price of natural resources is rising sharply. Additionally, water shortage is a considerable challenge to the eco-city development. This situation is mainly caused by excessive use, low efficiency, pollution and destruction of vegetation. Due to the significantly important role of clean water in the city, water scarcity can be a great challenge of the ecological construction. Moreover, pollution of air, water, soil and other areas brings enormous challenge of ecological urban environment. Not only destroys the biological balance, the pollution may also cause negative effects on human beings. There is a tendency that pollution is a severe damage to individuals, leading to physical diseases and mental illness.

3.0 IDEAS TO REDUCE ECOLOGICAL DEGRADATION IN URBAN LANDSCAPE DESIGN

Ecological landscape design is basically to maximize the use of nature and to improve regeneration capacity of nature system. To optimize ecosystem as much as possible in landscape design is the ultimate goal of landscape designers in the present times.

Based on the methods of ecological design, designers should pursue to maximize the combination of design and environment rather than only one of them. In the actual urban landscape designs, landscape ecology and construction optimize landscape pattern and process, reducing Urban heat island effect, water resources consumption, water environmental deterioration and global warming and so on. As excellent contemporary landscape architects, we should avoid designing only for design and try to make full use of the original elements of nature. But we cannot be shackled by the natural elements. In our design, we do our best to use renewable raw materials and reuse the materials on the site, maximizing the potential of materials to reduce production, processing and transport of materials and reduce construction

waste, and retain some characteristics of local traditional culture.

Certain suggestive methods for Eco-sensitive landscape Design:

1) The retention and re-use of the site:

Fully respecting original appearance of the site, retaining its original elements and reusing the original material not only save handling materials and avoid producing, processing and transporting those materials but also reduce the destruction of the ecological environment.



FIG3. THE PRIMARY THREAT TO THE URBAN LANDSCAPE IS HABITAT DESTRUCTION OR LOSS. IT ALTERS OR ELIMINATES THE CONDITIONS NEEDED FOR VEGETATION AND ZOOLOGY TO SURVIVE.

2) Priority to recycling materials and Eco-efficiency Based on local materials, promote the use of green materials. Strive to find a durable, locally produced, low-maintenance, and low-consumed materials.

The approach of using recyclable material and green landscaping can give a lot of beneficial effect in perspective of today's scenario. It can be started easily from the waste without investment and application of technical sense can convert the polluted places to a green city, thereby reducing the load in landfill sites.

Create a virtuous cycle of terrestrial ecosystems. Transform the "waste" mold into a new landscape through the recycling of materials and resource and thereby minimize the demand to new materials as well as reduce the demand of energy required for production of material obtained.



FIG 4. GRAPHIC DESIGN DONE IN A PUBLIC SPACE WITH THE HELP OF USED PLASTIC BOTTLES.

3) Conservation and preservation of non renewable resource: We can reduce the consumption of non-renewable energy sources as much as possible through science and technology, and widely use renewable energy in nature such as solar, wind, etc., to adapt to modern ecology environment.

Take Tilonia village, Rajasthan, India as an example. A well laid out village which plans and preserves the natural resources through the use of alternate energy resources in the buildings. Also termed as barefoot college.



FIG 5. USE OF SOLAR PANELS AS AN ALTERNATE SOURCE OF ENERGY AT BAREFOOT COLLEGE, TILONIA.

4) Reuse of certain specific building elements from dilapidated and dungeon site:

Reusing certain specific building elements from old and dilapidated sites can be a great approach towards sustainable development. Apart from reducing the load on construction debris and landfill sites, it can be a great way to restore and revive our past glory. Certain specific cities from Rajasthan (India), which had a glorious past, are now into ruins. They had beautiful havelis and landscaped gardens, which now are in a dilapidated condition due to ill maintenance. However,

certain specific elements from those buildings are still standing tall; all they need is a bit hammering and polishing.



FIG 6. CERTAIN BUILDING ELEMENTS RESTORED FROM OLD DILAPIDATED HAVELIS AND REUSED IN A NEW FORM.

5) Revival and restoration: water bodies, natural woodlands, landscaped gardens, Kunds, baories, inland public spaces, which were acting as major active and recreation zones for local communities in the yesteryears, have come under major stress these days due to massive urbanization.

Especially some of the Indian cities (jaipur, Varanasi etc) which, are now facing some critical challenges. These invaluable assets are now into a state of major dilapidation and a big waste as far as land recourse is concerned. The stepped wells of Rajasthan and the Ghats of Varanasi, which had once been the outcome of a magnificent blend of natural phenomena, cultural belief and manmade intervention, presently, face the threat of extinction. It is therefore an important issue ecologically, to formulate a comprehensive vision for Repair, Renovation and Restoration of these bygone classics.



FIG 7. RESTORATION OF A WATER BODY AT JAL MAHAL, JAIPUR, INDIA

6. Eco-Design for an overall sustainable development. Eco-design methods are diverse, but every method in practice has different characteristics. We can make our design more ecological by these eco-design methods. We may maximize the use of the original elements on the site, respecting the original buildings and facilities and give some new features to them. Efficient use of water to reduce water consumption is common in ecological planning and design. In some urban landscape design, gathering rainwater or dew to supply most of the landscape water, add water to the surrounding waterscape and supply buildings with clean water, etc., so that the city achieve zero water consumption. Or we can adopt various natural purification mechanisms like artificial wetlands. Water flow and the growth of aquatic plants are associated with water purification, so that the landscape is ecologically rational integration of the principles. The rich plant resources are also an important element that cannot be ignored. In urban eco-landscape design, when designers choose plant material, shapes are very important. You can attract people's attention by designing a variety of forms of plants and let people benefit from nature. In plant design, grass plot and ground cover plants lie low and stretch without a break making our space full of vitality and endless green.

4. CONCLUSION

Eco design principles and its elements have been a part of our lifestyle since the beginning. It is closely linked with our daily lives and culture. In the present times, protecting the natural ecological environment and promoting sustainable development of the human environment has become our urgent task. The concept of sustainable development into urban landscape design to expand the area of landscape design is the need of the day. Design should apply more native plants; respect the field on the original natural regeneration vegetation. Nature will have its evolution and update the rule, from ecological perspective. Ecologically, sustainability is taken seriously in order to balance natural resources and its development thereby protecting and

strengthening the production and updates of environmental systems. the urban designers and planners need to adhere to the view of ecology and culture, in the least damage to the site of the original ecological environment based on local conditions construction, inheritance historical context, regional development to push forward, through the mining of ecology and culture, to create a harmonious coexistence of cultural memory and the trend of the times of the urban space.

Any landscape, especially the urban landscape system, with the most closely related is human itself. Concept of sustainable development requires caring for people first, respecting for nature and thus the blindness of artificial modification of the natural environment is reduced, which precisely embodies the concept of ecological planning; at the same time, we should pay attention to specific regional characteristics of the environment. When we create landscape design, we should avoid damaging original ecological environment and respect biological and ecological needs in the environment after fully understanding the ecosystem characteristics of the landscape. Secondly, in process of urban landscape design, we protect and make use of natural resources. We maximize the use of natural green energy, reduce the use of pollution energy, and reduce environmental pollution. Overall, the concept of sustainable development of landscape design requires us to take eco-development as basis and respect for the ecological environment, strengthening recycling of the material and energy, Strengthen using self-sustaining and sustainable environment processing technology. In fact, the process of urban landscape ecological design is also the process of sustainable development of urban landscape. They integrate with each other. Their design intents are same. The sustainable development of urban landscape design represents a design method of respecting objective environment and using green techniques. When creating a green environment, we should express original beauty, namely, a deep harmony of human, biology and nature. Sustainable urban landscape design emphasizes on harmony and unity of nature and society. As art works, urban landscape design respects nature and matches the requirements of ecological development. In addition, it also improves the visual environment of a region, thereby enhancing the value of entire region and closely link with the social economy.

In short , urban landscaping design concept of sustainable development requires us to seek a balance between these factors, with both the rational use of landscape features of its own, but also good ecological and economic benefits of landscape, that is, the harmony and unity of nature and society.

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