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# Urban Resilience and Adaptation for India and Mongolia

Curricula, capacity, ICT and stakeholder collaboration to support green & blue  
infrastructure and nature-based solution

Report on:

**Lecture Material**

**Introduction to Landscape Design**

**Prof Shweta Suhane & Prof. Sneha Ramani**



***Partner number: P12***

**Nirma University**

**Gujarat, India**

## Disclaimer

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**Course Name:**  
**Introduction to Ecology & Landscape Design**

**Number of credits: 3 ECTS**

**Period: Fall semester**

Coordinator	<b>Prof Shweta Suhane &amp; Prof. Sneha Ramani</b>
Credits	3 ECTS
Lecturers	<b>Prof Shweta Suhane &amp; Prof. Sneha Ramani</b>
Level	3 <sup>rd</sup> Semester – B.Arch Program
Host institution	Nirma University
Course duration	15 Weeks

**Summary**

This is a 3 ECTS offline course which will introduce ecology, interactions in an ecological community, ecological cycles, impact of architectural design on sustainability and landscape to second-year bachelors in architecture students.

**Target Student audiences: 3<sup>rd</sup> Semester – B.Arch Program**

**Prerequisites: NA**

**Aims & Objectives**

The main course objective is to introduce basic concepts of ecology and landscapes to students to build a strong foundation for future courses. The focus will be more on the role of ecology and landscape in an ecosystem. The main objectives are:

- To define the ecology and landscape.
- To identify the significance of ecology and landscape to humans, and the built environment.
- To inculcate knowledge about natural selection, ecology, community, biodiversity, climate change and sustainability.

**Semester III, IAPNU**



source: Google images

# **LANDSCAPE DESIGN & Ecology ... an Introduction**

**LectureTopic:**

# Introduction to Landscape Design

What is **Landscape** ?

Why **Landscape**?

Have we all been interested in landscape **since childhood**?



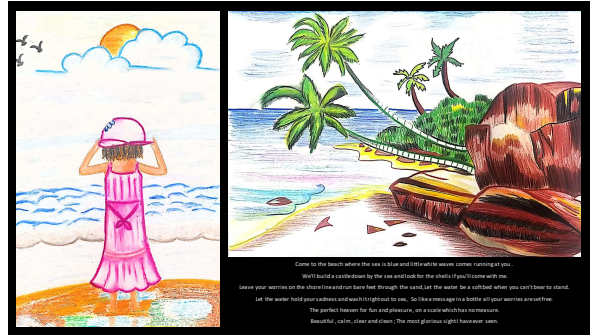
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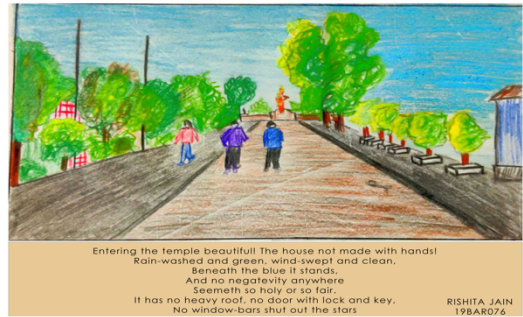
## Various interpretations of Landscape / A child's imagination



Prachi Mistry (19bar0564)



Binisha (19bar050)



Sanjana Joshi (19bar010)

### EXERCISE- LANDSCAPE MEMORY

Swinging on the branches of banyan tree

I still remember that day, I was almost 10 years old and once went on outing with my family to a nearby place all surrounded with natural beauty. There was a huge huge banyan tree with all their branches coming down and at that time it fascinated me a lot then my dad taught me and my brother how to swing through those branches. It was so much fun and kind of adventure for me. This is most beautiful memory I have with nature. Whenever I see any banyan tree I remember this scene and it takes me back to that day.



**landscape**

**noun:**

- all the visible features of an area of land, often considered in terms of their aesthetic appeal.
- a picture representing an area of countryside.
- the genre of landscape painting.
- the distinctive features of a sphere of activity.
- denoting a format of printed matter which is wider than it is high. "landscape format"

**Verb**

make (a garden or other area of ground) more attractive by altering the existing design, adding ornamental features, and planting trees and shrubs.

**Origin**

The modern form of the word, with its connotations of scenery, appeared in the late 16<sup>th</sup> century when the term *landschap* was introduced by Dutch painters who used it to refer to paintings of inland natural or rural scenery.

The popular conception of the *landscape* that is reflected in dictionaries conveys the **particular meaning** referring to an area of the Earth's surface & the **general meaning** being that which can be seen by an observer.

An example of this second usage can be found as early as 1662 in the [Book of Common Prayer](#):

**Could we but climb where Moses stood,  
And view the landscape over.  
(General Hymns, verse 536).**

There are several words that are frequently associated with the word landscape:

Scenery	Seascape	Setting	Cityscape	topography
Picturesque	Wilderness	view	countryside	
Terrain	environment	vista	panorama	perspective

*Landscape is more than just scenery.*

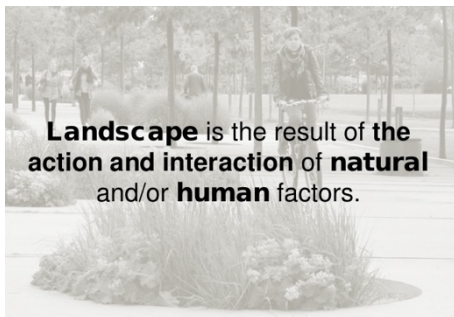
**LAND** - is one of the basic commodities of the world, its planning for use & conservation is a central political & social issue.

"**LAND**" means both a place and the people living there.

"**SCAPE**" means "to shape", & also mean association, partnership.

**Land** becomes "**Landscape**" when it is described or seen in terms of its physiographic & environmental characteristics. / varying according to the historical impact of man on it.

**Landscape is a reflection of dynamic, natural, & social systems.**



**A landscape is the visible features of an area of land, its landforms, and how they integrate with natural or man-made features.**

**Physical elements of land form**  
Geophysically defined landforms such as (ice-capped) mountains, hills, water bodies such as rivers, lakes, ponds and the sea

**Living elements of land cover**  
indigenous vegetation

**Human elements**  
different forms of land use, buildings, and structures

**Transitory elements**  
lighting and weather conditions

**Combining both their physical origins and the cultural overlay of human presence, landscapes reflect a living synthesis of people and place that is vital to local and national identity.**

**Character of a Landscape**

helps define the **self-image of the people** who inhabit it & a **sense of place** that differentiates one region from other regions.

It is the dynamic backdrop to people's lives.

It is as varied as:  
a farmland  
a landscape park or wilderness.

**The Earth has a vast range of landscapes:**

- |                                 |                                       |
|---------------------------------|---------------------------------------|
| icy landscapes of polar regions | mountainous landscapes                |
| vast arid desert landscapes,    | islands                               |
| coastal landscapes,             | densely forested or wooded landscapes |
| tropical rainforests,           | agricultural landscapes               |

**What is Landscape?**

"A picture representing a section of natural, inland scenery, as of prairie, woodland, mountains.. and expanse of natural scenery seen by the eye in one view."  
-Webster's New Universal Unabridged Dictionary

*All images source: Google images*

# Why Landscape?

## Why landscape?

- Aesthetics – Looks Nice
- Privacy
- Reduce erosion
- Wind or noise block
- Create recreation areas
- Increase property value

## Importance of Landscape

- Support our health and wellbeing by encouraging physical outdoor activity and an antidote to stress
- Offers aesthetic enjoyment, escapism, tranquility, and a sense of belonging to an area with a **distinct natural and cultural identity**.

## Planning

- Implies a futuristic approach to land.
- Land is regarded as a resource to be viewed in relation to the demands & predicted needs of society & its values.
- Planning Techniques involve political & economic procedure.

## Design

Refers to the qualitative & functional arrangement of parcels of land set aside in the planning process for some specific purpose such as housing, education, or recreation.

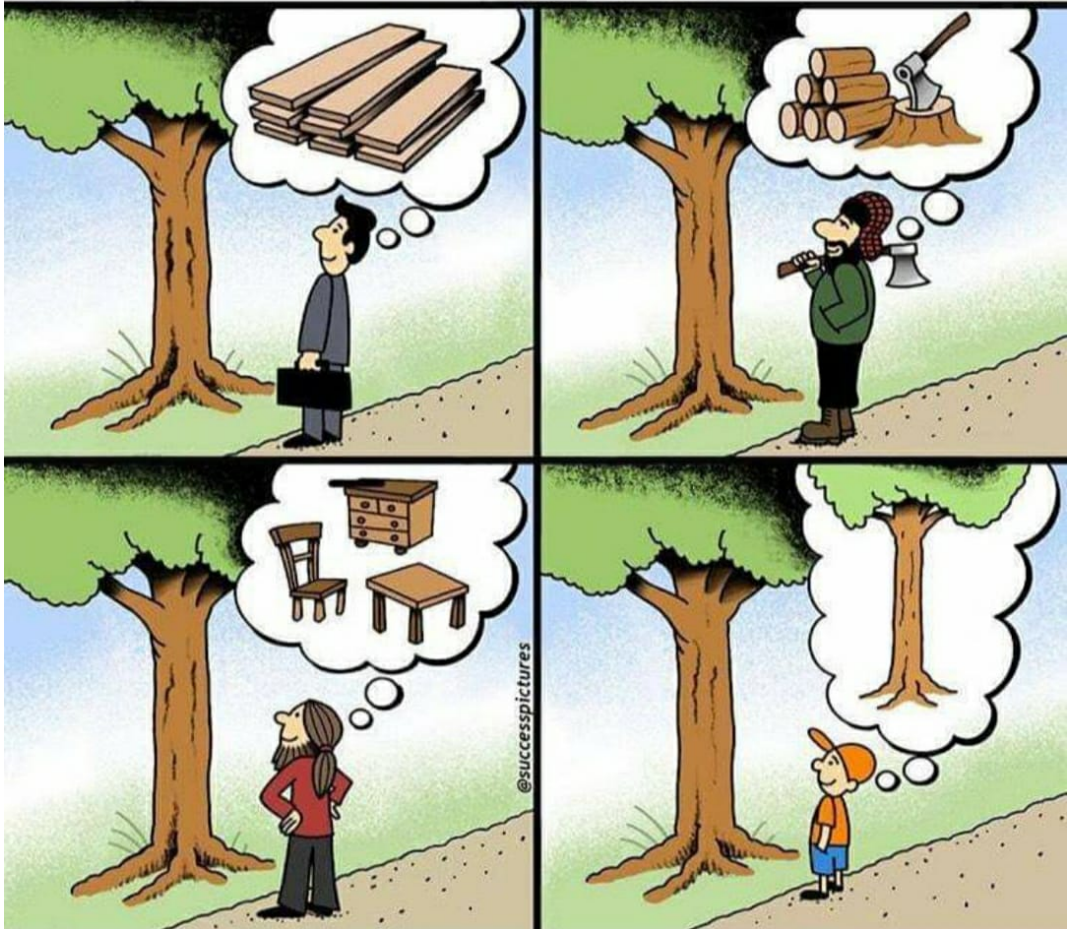
Design involves construction, planting & maintenances.

*All images source: Google images*



# Perspective.

@successpictures



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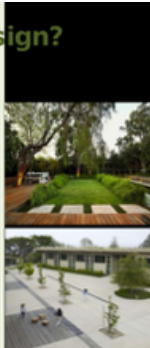
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[banksystore@fabiogomestrindade](mailto:banksystore@fabiogomestrindade) in Trindade, Brazil



**Source:** <https://www.redbubble.com/i/poster/Crazy-Plant-Lady-Graffiti-Street-Art-A-stylish-woman-painted-mural-with-live-Bougainvillea-plant-hair-by-IMP/Hives/83020763.LVTDI>

## What Is Landscape Design?

Landscape design is an independent profession and a design and art tradition.



Landscape Designing is the art and science of planning and design of out door open spaces, to meet the physical, economic and socio-behavioral needs of the users, respecting and in harmony with the existing contextual natural and man made environments.

## Landscaping

- Activity that modifies the visible features of an area of land
- Improve the aesthetic appearance of the area
- changing its contours, adding ornamental features, or planting trees and shrubs.



## Landscape Architect

- Apply creative and technical skill, scientific, cultural and political knowledge in the planned arrangement of natural and constructed elements on the land integrating **ecological sustainability**.
- Resulting environments shall serve **useful, aesthetic, safe and enjoyable** purposes

**Frederick Law Olmsted** – designer of New York City's Central Park, coined the term Landscape Architect in 1858.



All images source: Google images





Description

English: Detail from the [Taylor Map of New York](#) showing [Central Park](#).

Date

1879

Source

<http://hdl.loc.gov/loc/gmd/g/3804n/pm005990>

Author

Will L Taylor



Description An 1868 Map of Central Park taken from Wikipedia Commons, cropped and rotated to illustrate the Boys Playground.

Source Wikipedia Commons.

Date 1868

Author Calvert Vaux and Frederick Law Olmsted



New York City's Central Park spans 843 acres.  
That's 6% of the island of Manhattan



All images source: Google images

Garrett Expo defines landscape architecture as

Covering that portion of the landscape which is developed or shared by man, beyond buildings, roads or utilities and up to wild nature, designed primarily as space for human living (not including agriculture, forestry).

It is the establishment of relations between building, surfacing and other outdoor construction, earth, rock forms, bodies of water, plants and open space & the general form and character of the landscape;

but with primary emphasis on the human content, the relationship between people and landscape, between human beings and three-dimensional outdoor space quantitatively and qualitatively.

**This definition is essentially concerned with site planning and the relations between people and design in that context.**

### A Theory of Landscape Architecture

Five major components

1. Natural Process
2. Human Factors
3. Methodology
4. Technology &
5. Values.



It must be based on set of values (*most difficult part of the theory to deal with*)

natural and social science methodology and technique can be learnt

values have to be lived and felt.

experience and good sense tell us that we need to develop a set of priorities and subscribe to a land ethic related to our Belief in the "alternative for survival" in which short-term profit at the expense of long-term regeneration and conservation of resources would be unthinkable.

environmental impact must be seen in regional context.

quantity must be created with quality.

we must learn to make judgements in term of what is considered best for the common good and the future of mankind.

### The practice of landscape architecture

Over the years the realm of landscape architecture has diversified & classified its activities in response to the needs of a changing world.

There are now four related type of practice.

1. landscape evaluation and planning.
2. site planning
3. detailed landscape design
4. urban design.

There is an inter relationship among these four types.

The wider landscape urban or rural is the context for the site which in turn is the **framework** within which lies the **details**.

but just as it is reasonable to expect that small scale projects such as garden or Park should be influenced by and respond to the larger environment so it is true that criteria for certain large-scale and planning decisions for urban design depend on understanding of the details of design and technology in siting buildings roads and facilities.

**We have to understand both scales to do the project with responsibility and sensitivity.**

### Landscape Architecture Profession

- OLD Approach : Landscape Gardening
- New Approach : Design with Nature
- Contemporary Approaches :
  - i. Sustainability and Landscape
  - ii. Modification of micro-climate through energy efficient enviroscaping
  - iii. Resource efficient landscape :TERI GRIHA
  - iv. Ecology and Habitat creation

### Architects, Planners, Landscape & Urban Design

- Architects design interior and outdoor spaces (3D)
- Planners plan and design Neighborhood /city (2D)
- Landscape architects design Enclosures (4D)
- Urban Designers creates Place (3D)

### The 4<sup>th</sup> dimension TIME

#### an important aspect of Landscape Architecture

The far reaching conception the designer must have in developing 'a picture so great that nature shall be employed upon it for generations, before the work he has arranged for her shall realize his intentions'.

### SPROUL PLAZA, University of California



August 1964



June 1980



April 1984

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Lovell, S. T. and D. M. Johnston. 2009. Designing landscapes for performance based on emerging  
principles in landscape ecology. *Ecology and Society* 14(1): 44. [online] URL: <http://www.ecologyandsociety.org/vol14/iss1/art44/>



## Synthesis

# Designing Landscapes for Performance Based on Emerging Principles in Landscape Ecology

*Sarah Taylor Lovell<sup>1</sup> and Douglas M. Johnston<sup>2</sup>*

**ABSTRACT.** We have proposed a framework for transforming landscapes to improve performance by integrating ecological principles into landscape design. This effort would focus on the development of multifunctional landscapes, guided by the rapidly growing knowledge base of ecosystem services provided by landscape features. Although the conventional approach to landscape ecology is based on a model that assumes poor ecological quality in the human-dominated matrix, a review of recent literature reveals important opportunities to improve the quality of the landscape matrix by increasing spatial heterogeneity through the addition of seminatural landscape elements designed to provide multiple ecosystem services. Taken alone, these individual elements might not appear to have a large impact on the environment, but when considered together within the entire landscape, the contribution could be significant, particularly when these elements are intentionally designed to improve landscape performance. Previous attention has focused on the value of large patches of native vegetation for conservation efforts. These efforts have included preserving those areas that still remain, restoring those that once existed, and providing connectivity between them. But great opportunities exist to improve the quality of the matrix by designing multifunctional elements throughout the landscape. Through a synthesis of knowledge in landscape architecture and landscape ecology, we have demonstrated some important applications of the landscape performance framework in urban and agricultural settings. Based on a review of the literature, we have suggested several methods of evaluating and monitoring landscape performance to determine the relative success of a designed landscape.

**Key Words:** *agroecosystem; design guidelines; ecological design; ecosystem services; human-dominated; multifunctional landscape; multifunctionality; urban agriculture; urban ecology.*

## INTRODUCTION

According to the U.S. Census Bureau (2008), global population exceeded 6 billion in 2000, and is expected to reach 9 billion by 2050. Conventional knowledge suggests that the growing global population will require more land on which to live and produce food for survival, and that this land requirement will come at the expense of native ecosystems as they are converted to cropland or urban living spaces (anthropogenic landscapes). This pattern has been observed in many cultures during various time periods throughout history. Today, however, we live in a world where only a small percentage of land remains relatively undisturbed. This land is found primarily in areas where agriculture, and thus human occupation, is inefficient and even impractical. Many scientists

agree that these relatively undisturbed areas should be protected and conserved due to the important ecological functions they provide (Wilson et al. 2007). Although there is great pressure to support a growing population, an alternative to the conversion of our last remaining important ecosystems is needed. We suggest that one solution may be found through the integration of existing knowledge in the fields of landscape architecture and landscape ecology. This synthesis can be used to develop creative alternatives for the transformation of our anthropogenic landscapes, with a focus on multifunctionality for improving overall performance of the landscape.

The field of landscape ecology has recognized and even encouraged a connection between science and landscape design from the beginning. European

<sup>1</sup>University of Vermont, <sup>2</sup>Iowa State University



# Bridging landscape preference and landscape design: A study on the preference and optimal combination of landscape elements based on conjoint analysis

Keyi Cai <sup>a</sup>, Wenwen Huang <sup>a</sup>, Guangxi Lin <sup>a, b, c, d, e</sup>

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## Abstract

Landscape preference is the focus of landscape research, in which the relationship between landscape elements and landscape preference is an important issue. Most previous studies have analysed correlation between the landscape preference scored by the public and scores on the quality of landscape elements by experts; some have compared the effects of individual landscape elements on landscape preference by photo simulation. In this study, landscape preference is regarded as the selection preference of landscape element combination. The conjoint analysis method is used to further explore the ranking and optimal combination of the significant degrees of impact of landscape elements on landscape preference when multiple landscape element combinations are used. The results show that the influence degrees of landscape elements on landscape preference in urban parks followed the order water, square, openness of the landscape, vegetation, road and seats. The optimal combination of landscape elements is the open landscape with flowing water, a shaded square, rich vegetation, a road and seats. This study demonstrates the advantages of the conjoint analysis method over the univariate method in controlling multiple variables, improving experimental efficiency and obtaining more meaningful results. A combination of urban park landscape elements based on landscape preference is helpful to inspire landscape architects to make choices among multiple landscape elements, provides evidence-based design methods for

## Reference Reading Material for Articles:

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