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3.3- Research Publication and Awards (25)

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1	Cultural Urban Forests: For Sustaining Urban Ecology, Environment and Conservation of Cultural Values
2	Landscape as a Method and Medium for the Ecological Urban Development: An approach to urban-regional planning and development
3	Cultural Urban Forests: For Sustaining Urban Ecology, Environment and Conservation of Cultural Values



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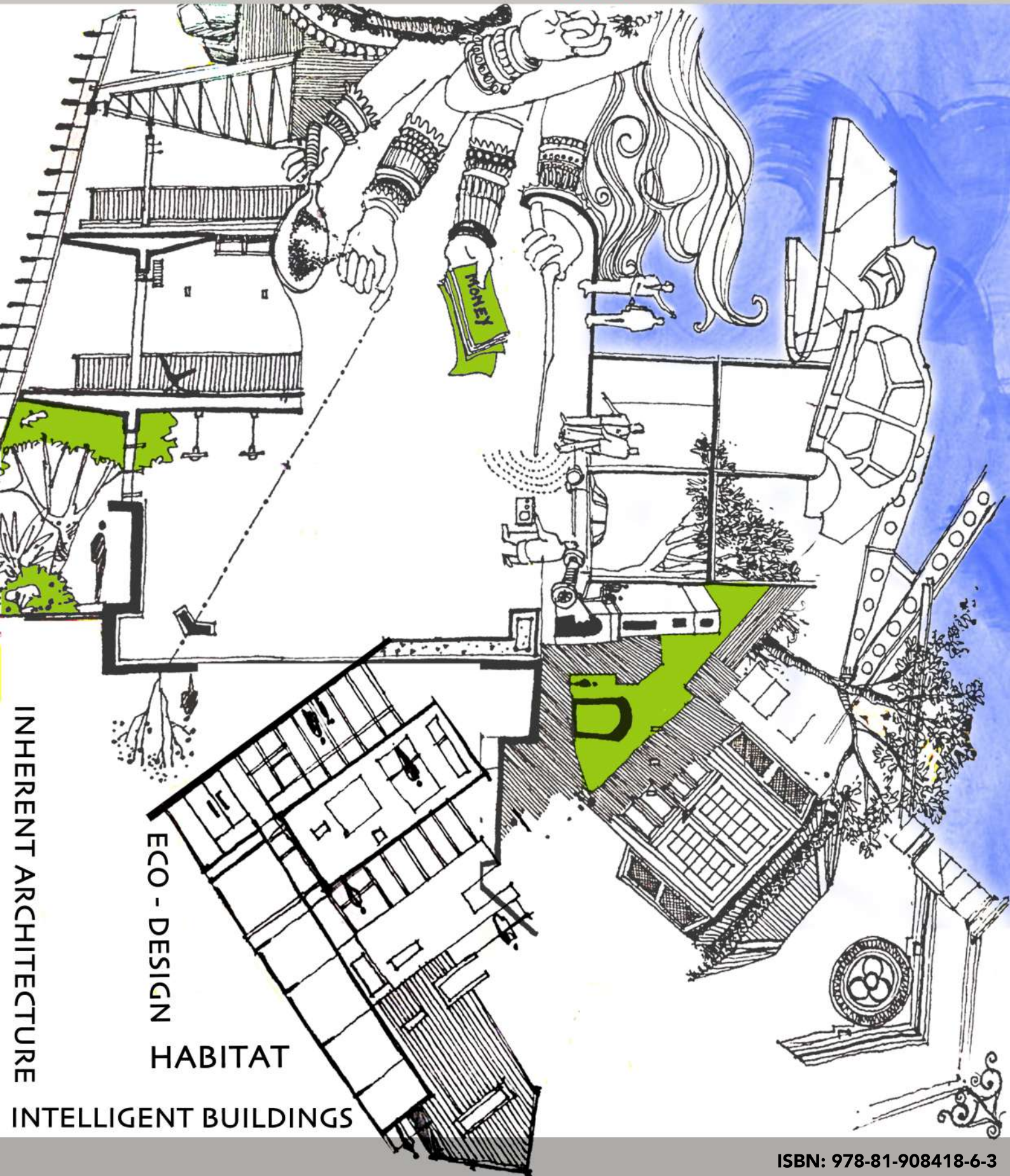
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D Y PATIL
SCHOOL OF
ARCHITECTURE
AMBI, PUNE



Savitribai Phule
Pune University



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ECO - DESIGN
HABITAT
INTELLIGENT BUILDINGS

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Cultural Urban Forests: For Conservation of Culture

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ABSTRACT

This paper is aiming to study evolution of forest as per chronological order of Indian landscape and Hindu scripts for , deriving guidelines to design Cultural Urban Forest. Objectives of this study are to study chronological order of Indian forest landscapes, to study issues and impacts of deforestation in past, to study Hindu scripts for , understanding concepts of ecology, environment and city planning, to study actions taken against forests during British rule to post independent era and their impacts on forests. Methodology would be conducted through literature review of evolution of forest from agni purana (4000 years ago) to post independent era. Term Cultural forest would also help to revive different terminologies like cultural landscapes , sacred forests and groves, sacred corridors & variety of ethno forestry, monastery forest, sacred trees, biodiversity, environmental, ecology, mass plantation which were coined by our ancestors and incorporated it in city planning. By reviving and implementing all our ancestors concepts of landscape city planning and its correlation with surrounding landscapes could make the cities culturally rich . Indirectly the study would throw light on conservation and enhancement of cultural native species, culture and can rebuilt neighborhood relationships which is been lost now days.

KEYWORDS: Forest, Context, Culture, Chronological order , India, Conservation

1. INTRODUCTION TO THE TOPIC

Tangibly and intangibly, forests feature in all aspects of culture: language, history, art, religion, medicine, politics, and even social structure itself. Forests provide the venue for religious, social, and healing ceremonies. Urban forest is either as a forest within the city or a forest upon which a city relies. These city greens acts as an ecosystem, including not just trees, but their dynamic relationships and interactions with factors biotic and a biotic. Cultural urban Forest could be important element in development of cities for making them culturally rich in terms of culture, ecology, environment.

1.1 SCOPE:

Forests feature in all aspects of culture: language, history, art, religion, medicine, politics, and even social structure.

1.2 LIMITATIONS:

Study is limited to Indian context and Hindu festivals only.

1.3 NEED OF THE TOPIC:

From anthropological, ethno botanical and linguistic studies it is observed that, along with environmental and ecological values, forests has cultural significance in Indian Culture. (fao.org, n.d.) Term Cultural Urban Forest refers to forests in urban areas having planting policy and activities based on Indian festivals, Culture and rituals. Every seasons has some festivals and their association with nature. Nature also displays a distinctive character in every season which keeps changing landscape characters of the city. Hence, Cultural urban forest would be in fact be a forest of celebrating Nature and Culture along with providing the visitors the knowledge about the association of nature in the form of vegetation and other elements with festivals. It would also create awareness and strengthen the association of man with nature and cluster of trees would provide the venue for religious, social, and healing ceremonies. It's

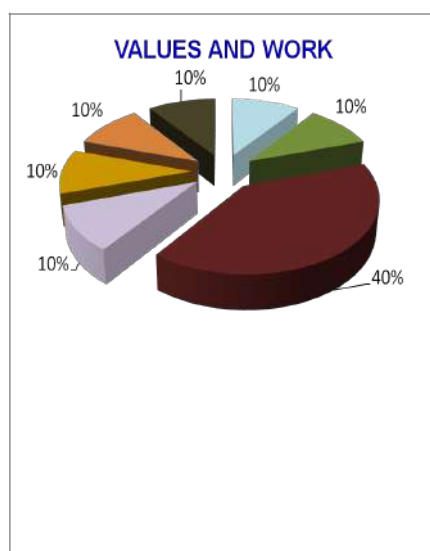
time to rebuilt neighborhood relationships and revival of our culture, through Landscape City Planning by bringing new concepts like CULTURAL URBAN FOREST! Due to westernization we are losing our culture and new generation is unaware of our traditions and culture. Hence developing Cultural Urban Forest areas within city areas will be beneficial for sustaining environment, ecology and conservation of cultural values.

2. OBSERVATIONS AND FINDINGS

2.1 Chronological order of values and work associated with landscapes: (Anon., n.d.)

2.2 FINDINGS:

NO	<i>Agni purana</i>	Indus valley	Vedic period - 1200-500 BC				Chandra Gupta Maurya	Ashoka	The Muslim	The Mughals
CHRONOLOGICAL ORDER FOR VALUES AND WORK DONE										
CIVILIZATIONS AS PER ORDER	4000 years ago	3000-2600 BC	Pre Vedic period	Post Vedic period	Manusm ruti - Post Vedic period	Caraka-Samhita and Susruta-Samhita	322-185 BC	273-237 BC	1000-1750	1483-1757 A.D
LEGEND	Materialistic Use (Total 10%)	City Planning (Total 10%)	Ecology (Total 40%)	Ecology (Total 40%)	Ecology (Total 40%)	Environment (Total 10%)	Ecology (Total 40%)	Preservation of flora fauna (Total 10%)	Deforestation (Total 10%)	Garden Planning (Total 10%)
	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%

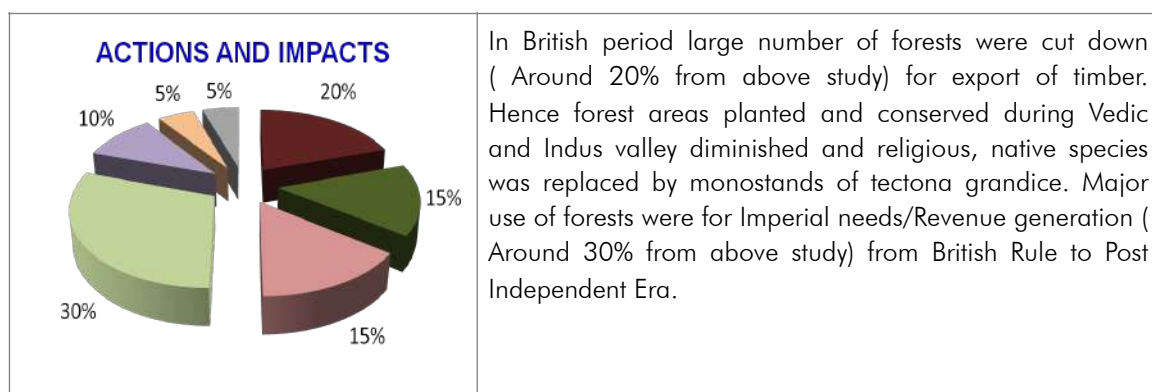


Above chronological study shows that, from Mughal Period Planning, Management And Conservation Of Forest Landscapes got DIMINISHED and trend of Garden Designing and beautification was emerged. Major Contribution in Landscape Planning on Ecological Values (Around 40% from above study) was covered During Pre Vedic period to Chandra Gupta Maurya

2.3 Actions taken against forests and their impacts (Shalini lyengar, n.d.)

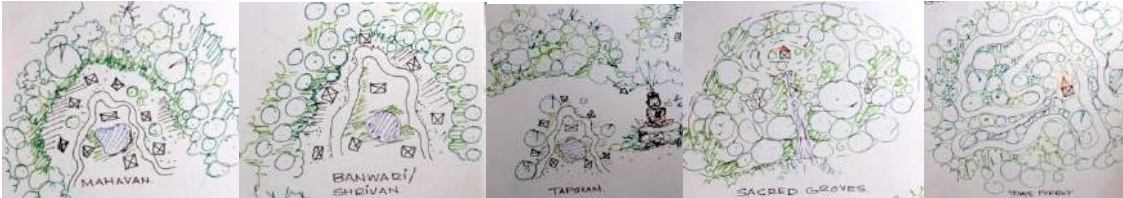
2.4 FINDINGS:

NNO	British Rule										During world war - I	Post Independent Era
CHRONOLOGICAL ORDER FOR ACTIONS TAKEN												
CHRONOLOGICAL ORDER	11750-1947 A.D	1800	1806	1855	1865 to 1894	From 18th century	Between 1926 and 1947	In the early 1930s	1947	1952	1976	
LEGEND	Deforestation (Total 20%)	Deforestation (Total 20%)	Afforestation Of Monostands (Total 15%)	Afforestation Of Monostands, Conservation of forest (Total 10%)	Imperial needs/ Revenue Generation (Total 30%)	Techniques for Sustainability of forest (Total 10%)	Imperial needs/ Revenue Generation (Total 30%)	People participation - conservation of wildlife. (Total 5%)	Imperial needs/ Revenue generation (Total 20%)	Conservation of forest (Total 15%)	Plans for tribal economy and wildlife reserve (Total 5%)	
	10%	10%	10%	5% 5%	10%	5%	10%	5%	10%	10%	5%	



3. CONCLUSIONS

1. City Planning and Forest Landscape planning were not separate entities in ancient time, means forest areas were part of city planning itself.
2. Forests were categorized by different activities and use. For example,
 - i. Mahavan- Forest adjoining to village (Khanna, n.d.)
 - ii. Banwari/Shrivan- productive Forest, having monostands (Khanna, n.d.)
 - iii. Tapovan- Forest for religion (Khanna, n.d.)



1. Mahavan 2. Banwari/Shrivan 3. Tapovan 4. Sacred Groves 5. Temple Forest

3. The concept like Cultural Landscapes , Sacred Forests And Groves, Sacred Corridors & Variety Of Ethno Forestry, Monastery Forest, Sacred Trees, Biodiversity, Environmental, Ecology, Mass Plantation was coined by our ancestors and was incorporated it in city planning.
4. From British era different categories of forests derived by our ancestors got vanished and today also we follow only two categories of forests, those are Reserve Forest and Protected Forest, which is not actually inherent.
5. Britishers destroyed our forests and monoculture, exotic species were planted, which is majorly affected ecology and environment.
6. Tangibly And Intangibly, forests Feature In All Aspects Of Culture: Language, History, Art, Religion, Medicine, Politics, And Even Social Structure Itself.
7. Hence, Holistic Approach Is Needed To Develop Forest Areas And It's Time To Revive And Implement All Our Ancestors Concepts Of City Planning And Its Correlation With Surrounding Landscapes To Make The Cities Culturally Smart And Rich.

4. References

1. Anon., n.d. edugreen.teri.res.in. [Online] teri Available at: <http://.fao.org>, n.d. docrep/t9450e/t9450e06.htm#TopOfPage. [Online] Available at: www.Khanna, A.N.P, n.d. In Ancient Landscape History. pp.14-16.
2. Shalini lyengar, P.D., n.d. What's in a name? Defining forests in India.

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Cultural Urban Forests: For Sustaining Urban Ecology, Environment and Conservation of Cultural Values

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Abstract - This paper is aiming to study evolution of forest as per chronological order of Indian landscape and Hindu scripts for, deriving guidelines to design Cultural Urban Forest. Objectives of this study are to study chronological order of Indian forest landscapes, to study issues and impacts of deforestation in past, to study Hindu scripts for, understanding concepts of ecology, environment and city planning, to study actions taken against forests during British rule to post independent era and their impacts. Methodology would be conducted through literature review of evolution of forest from Agni purana (4000 years ago) to post independent era. Term Cultural forest would also help to revive different terminologies like cultural landscapes, sacred forests and groves, sacred corridors & variety of ethno forestry, monastery forest, sacred trees, biodiversity, environmental, ecology, mass plantation, which were coined by our ancestors and incorporated them in city planning. Reviving these concepts could make the cities culturally rich. The study would throw light on conservation and enhancement of cultural species, culture and can rebuilt neighborhood relationships.

Index Terms - Context, Conservation, Culture, Forest

INTRODUCTION TO THE TOPIC

Tangibly and intangibly, forests feature in all aspects of culture: language, history, art, religion, medicine, politics, and even social structure itself. Forests provide the venue for religious, social, and healing ceremonies.

Urban forest is either as a forest within the city or a forest upon which a city relies. These city greens acts as an ecosystem, including not just trees, but their dynamic relationships and interactions with factors biotic and a biotic.

Cultural urban Forest could be important element in development of new cities for making them smart in terms of culture, ecology, environment. (John A. Parrotta, (25 September 2007))

Scope:

Forests feature in all aspects of culture: language, history, art, religion, medicine, politics, and even social structure.

Limitations:

Study is limited to Indian context and Hindu festivals only.

Need of the topic:

From anthropological, ethno botanical and linguistic studies it is observed that, along with environmental and ecological values, forests has cultural significance in Indian Culture. (docrep/t9450e/t9450e06.htm#TopOfPage) Term Cultural Urban Forest refers to forests in urban areas having planting policy and activities based on Indian festivals, Culture and rituals. Every seasons has some festivals and their association with nature. Nature also displays a distinctive character in every season which keeps changing landscape characters of the city. Hence, Cultural urban forest would be in fact be a forest of celebrating Nature and Culture along with providing the visitors the knowledge about the association of nature in the form of vegetation and other elements with festivals. It would also create awareness and strengthen the association of man with nature and cluster of trees would provide the venue for religious, social, and healing ceremonies. It's time to rebuilt neighborhood relationships and revival of our culture, through Landscape City Planning by bringing new concepts like **CULTURAL URBAN FOREST!** Due to westernization we are losing our culture and new generation is unaware of our traditions and culture. Hence developing Cultural Urban Forest areas within city areas will be beneficial for sustaining environment, ecology and conservation of cultural values.

Methodology:

Methodology Is conducted through, Literature review, data collection and interview method. For understanding Term Cultural Urban Forest, Issues, significance of forests, Concept of forest as per Indian chronological order and Hindu Scripts, Evolution of forest and concept of ecology, environment, as per ancient time, Understanding evolution of the term forest and concepts of landscape, environment, ecology and cultural values and need of forests for deriving Guidelines for Designing Cultural Urban Forests

OBSERVATION AND FINDINGS:

	Concept Of Forest, Landscape, Ecology, Environment, City Planning	Findings, Contributions
1.	Agni purana- 4000 years ago	
	It states that man should protect trees to have material gains and religious blessings.	-
2	Indus valley -3000-2600 BC	
	<p>Concept of Village -Vedic traditions affirm that every village will be complete only when certain categories of forest vegetation trees are preserved in and around its territory.</p> <p>Also no village would be complete without its woodlands in and around the house.</p> <p>Every village must have a cluster of five great trees, <i>panchavati</i> symbolizing the five primary elements earth, water, fire, air and ether-the totality of everything.</p>	<p>Types of forest:</p> <p>i. Mahavan- great natural forest-Equivalent to protected areas of today.-It adjoins the village & provides a place where all species can coexist.</p> <p>ii. Banwari / Shrivani- Forest of wealth.-It is another kind of forest which established after, original forests are cleared.-Equivalent to production forest areas of today.-It provides essential goods and services to humans and live stock-These can be in the form of monospecific stands (plantations) or species mixtures (agro forests).</p> <p>iii. Tapovan- Forest of religion.-Home of sagas-Being sacred ,no animal or tree could be harmed in these forests.-This kind of forest is natural and untended , but is specifically set aside as a place for practice of religion.</p>
3.	Vedic period - 1200-500 BC	
a.	Pre Vedic period	
	The Hindu idea is that, whole world is forest, to keep this world as it is, they have to keep the world forest intact	The concept of cultural landscapes such as sacred forests and groves, sacred corridors & variety of ethno forestry practices that mirror the “ecosystem” like concepts.
b.	Post Vedic period	
	The tradition of pre Vedic period continued , in addition to considering a landscape as such valuable and sacred individual species and micro units were also treated as sacred.	Temple forest, monastery forest, sacred trees
c.	Manusmruti- Post Vedic period	
	Religion plays diversified role in saving the integrity of the natural environment. Importance was given for conserving and domesticating animals, biodiversity protection, and vegetarian food habit	<p>Ecological awareness</p> <p>i. Biodiversity means all living forms broadly ascribed as chara (movable living world) and achara (immovable: plant kingdom).</p> <p>ii. Pollution refers to spoilage of the five gross elements by unethical activity.</p>

		iiii. Contamination refers to any action against wholesomeness (soucha)
d.	Caraka-Samhita and Susruta-Samhita	
	Charaka and Susrata classified lands according to the nature of the soil, climate and vegetation into three categories: i. Jangala, or the region of open spaces where a steady dry wind blowed. ii. Anupa, or the marshy tract bordered by seas, where cold wind and networks of rivers prevailed. iii. Sadharana, or the intermediate regions which had some of the features common to the other two regions.	i. The common plants of the Jangala region were khadira (acacia catechu), asana (terminalia tomentosa) and badari (zizyphus jujuba). ii. The common plants of Anupa were vanjula (cane or reed), hintala (kind of palm) and narikela (coconut), varieties of lotuses and water lilies, variparni (pistia sp.), Musika-parni (salvinia sp.), Jalanili (algae) and saivala (moss). iii. The common plants of intermediate regions were mandara or parijataka (coral tree) and santana (kalpa tree).
Vedic people assimilated new environmental values and the concept of "sacred groves", productive aspects of forest vegetation was emphasised		
4	Chandra Gupta Maurya : 322-185 BC	
	Importance was given on the protection and management of forests, gardens, orchards as these all were considered as sources of revenue, besides being of recreational spots. Kautilya divided the country between the Himalayas and the oceans into various kinds of regions	The book Arthasastra written by Kautilya, the minister of Chandragupta Maurya (321-297 BC), informed that the people knew about the rainfall regimes, soil types and appropriate irrigation techniques in specific micro-ecological contexts.
	Forests	Aranya
	Village areas	Gramya
	Mountains	Parvata
	Plains	Sama
	Uneven lands	Visawa
	Drylands	Bhauma
Perception and concern about the living creatures -domestic and wild animals, plants and vegetations		
5	Ashoka - 273-237BC	
	He stated that wild animals and forests should be preserved and protected	He launched programmes to plant trees on a large scale. These rules continued even during the Gupta period.
6	The Muslim -1000-1750	
	During the Muslim invasions a large number of people had to flee from the attacks and take refuge in the forests. This was the beginning of a phase of migration to the forest.	i. They cleared vast areas of forests to make way for settlements. ii. The Muslim invaders were all keen hunters and therefore had to have

		patches of forests where they could go hunting
7	The Mughals -1483-1757 A.D	
	They showed more interest in gardens and their development.	i. Akbar ordered the planting of trees in various parts of his kingdom. ii. Jahangir was well known for laying out beautiful gardens and planting trees

Table.1- Containing chronological order of Indian Forest landscapes and concepts of Forest, Landscape, Ecology, Environment and City Planning as per Hindu scripts. (Khanna)

<i>Agni purana</i>	Indus valley	Vedic period - 1200-500 BC				Chandra Gupta Maurya	Ashoka	The Muslim	The Mughals
Chronological Order									
4000 years ago	3000-2600 BC	Pre Vedic period	Post Vedic period	Manusmrti - Post Vedic period	Caraka-Samhita and Susruta-Samhita	322-185 BC	273-237BC	1000-1750	1483-1757 A.D
Values And Work									
Materialistic Use	City Planning	Ecology	Ecology	Ecology	Environment	Ecology	Preservation of flora fauna	Deforestation	Garden Planning

Findings of above study:

	<p>Above chronological study shows that, from Mughal Period Planning, Management And Conservation Of Forest Landscapes got DIMINISHED and trend of Garden Designing and beautification was emerged. Major Contribution in Landscape Planning on Ecological Values was covered During Pre Vedic period to Chandra Gupta Maurya</p>
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Actions And Impacts:

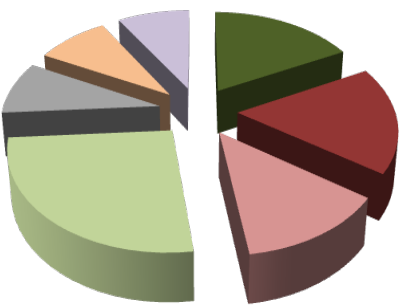
No	British Rule
1750-1947 A.D	<ul style="list-style-type: none"> i. Large numbers of trees such as the sal, teak, and sandalwood were cut for export. ii. The history of modern Indian forestry was a process by which the British gradually appropriated forest resources for revenue generation. iii. Trees were felled without any thought. iv. Trees could not be felled without prior permission and knowledge of the authority. v. This step was taken to ensure that they were the sole users of the forest trees.
1800	<ul style="list-style-type: none"> i. A commissioner was appointed to look into the availability of teak in the Malabar forests.
1806	<ul style="list-style-type: none"> ii. The Madras government appointed Capt. Watson as the commissioner of forests for organizing the production of teak and other timber suitable for the building of ships.
1855	<ul style="list-style-type: none"> i. Teak plantations were raised in the Malabar hills and acacia and eucalyptus in the Niligiri hills. ii. Lord Dalhousie regulations for conservation of forest in the entire country.
1865 to 1894	Forest reserves were established to secure material for imperial needs.
From 18th century	Scientific forest management systems were employed to regenerate and harvest the forest to make it sustainable.
Between 1926 and 1947	Afforestation was carried out on a large scale in the Punjab and Uttar Pradesh.
In the early 1930s	People began showing interest in the conservation of wild life.
8	During world war - I
	<ul style="list-style-type: none"> i. Between the two wars, great advancements in scientific management of the forests were made, with many areas undergoing regeneration and sustained harvest plans being drawn up. ii. Emphasis was still not on protection and regeneration but on gaining maximum revenue from the forests. iii. Forest resources were severely depleted as large quantities of timber were removed to build ships and railway sleepers and to pay for Britain's war efforts.
1947	<ul style="list-style-type: none"> i. A great upheaval in forestry organization occurred. ii. The princely states were managed variably, giving more concessions to the local populations. iii. The transfer of these states to the government led to deforestation in these areas. But some forest officials claim that the maharajas cut down a lot of their forests and sold them. iv. This may have been the case in some instances, but a lot of forest had existed and has been lost since the government took over these states.
9	Post Independent Era

1952	<ul style="list-style-type: none"> i. The new forest policy of 1952 recognized the protective functions of the forest and aimed at maintaining one-third of India's land area under forest. ii. Certain activities were banned and grazing restricted. iii. Much of the original British policy was kept in place, such as the classification of forest land into two types.
1976	<ul style="list-style-type: none"> i. The governance of the forest came under the concurrent list. ii. 'Development without destruction' and 'forests for survival' were the themes of the next two five-year plans, aiming at increasing wildlife reserves and at linking forest development with the tribal economy. But a large gap between aim and achievement exists still.

Table.2- Containing Actions taken against forests during British rule to Post independent era and their impacts on forests and city planning. (Gopa, 1989) (Gopa, 1989)

British Rule										During world war - I	Post Independent Era
Chronological Order											
11750-1947 A.D	1800	1806	1855	1865 to 1894	From 18th century	Between 1926 and 1947	In the early 1930s	1947	1952	1976	
Deforestation	Deforestation	Afforastraion Of Monostands	Afforastraion Of Monostands	Imperial needs/Revenue generation	Techniques for Sustainability of forest	Imperial needs/Revenue generation	People participation - conservation of wild life.	Imperial needs/Revenue generation	Conservation of forest	Plans for tribal economy and wildlife reserve	

Findings of above study:

<p style="text-align: center;">ACTIONS AND IMPACTS</p> 	<p>In British period large number of forests were cut down for export of timber. Hence forest areas planted and conserved during Vedic and Indus valley diminished and religious, native species was replaced by monostands of tectona grandice. Major use of forests were for Imperial needs/Revenue generation from British Rule to Post Independent Era.</p>
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CONCLUSIONS

- 1.City Planning and Forest Landscape planning were not separate entities in ancient time, means forest areas were part of city planning itself.
- 2.Forests were categorized by different activities and use. For example,
 - i. Mahavan- Forest adjoining to village (Khanna)
 - ii. Banwari/Shrivan- productive Forest, having monostands
 - iii. Tapovan- Forest for religion (Khanna)



1.Mahavan 2.Banwari / Shrivan 3.Tapovan



4. Sacred Groves 5. Temple Forest

4. From British era different categories of forests derived by our ancestors got vanished and today also we follow only two categories of forests, those are Reserve Forest and Protected Forest, which is not actually inherent.
5. Britishers destroyed our forests and monoculture, exotic species were planted, which is majorly affected ecology and environment.
6. Tangibly And Intangibly, forests Feature In All Aspects Of Culture: Language, History, Art, Religion, Medicine, Politics, And Even Social Structure Itself.

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Implementations:

This could be implement in three phases. First one is at regional level, find out opportunistic sites (green areas) in regional plan and apply this strategy. Second one is at macro level, large number of upcoming townships which occupies acres of lands , some green spaces of such a townships could be converted to cultural urban forests. Third last one is at micro level , home gardens or any small patch of land can be converted to cultural forest areas. Apart from this following are the different categories where this can be implemented at city level such as Hills & Institutional , Lakes & Streams , Residential & Urban Parks , Industrial & Wastelands, Rivers & Transport Corridor.

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REFERENCES

All of the examples given above may be summarized by citing a few references in the form we would like you to use. Here are some examples that would be cited in the text as (Crosley, 1988), (Essinger, 1991, May 28, pp. 97-99), (Armstrong & Keevil, 1991, p. 103), and so forth.

Printed Book

Ancient Landscape History- Author- Ar. Nupur Prothi Khanna, Page No-14-16-

Magazine Article

Joshi Gopa- Cultural Survival Quarterly Magazine, (June 1989). 13-2 India: Cultures in Crisis, Issues: Lands, Resources, and Environments

Journal Article

Traditional knowledge, cultural heritage and sustainable forest management: Edited by John A. Parrotta, Mauro Agnoletti, Volume 249, Issues 1-2, Pages 1-140 (25 September 2007)

Vol 1: Urban Ecology

Interview

Prof. Ketki Ghate (Ecologist), Public Interviews

World Wide Web Address

<http://www.indiaenvironmentportal.org.in/files/Forestry%20in%20ancient%20India.pdf>

<http://www.fao.org/docrep/t9450e/t9450e06.htm#TopOfPage>

<https://scenariojournal.com/article/building-the-urban-forest/>

<http://www.britannica.com/eb/article?eu=121168>

<http://edugreen.teri.res.in/explore/forestry/history.htm>

http://www.academia.edu/7348769/Forest_and_Biodiversity_in_Ancient_India_A_review

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Landscape as a Method and Medium for the Ecological Urban Development: An approach to urban-regional planning and development

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Abstract - Designed Landscape is never a natural space, can be a feature of natural environment. It is always artificial, dominated by human activities and subjected to natural process of growth, maturity and decay. Landscape Design is used as a tool only to meet human functional need, visual pleasure but environmental effects are ignored.

The aim of this study is to identify the role of Landscape as a method and medium for the ecological urban development.

Urban development is the reason for transformation of natural landscape and its ecological function. It disturbs the natural habitat, species composition, alters hydrological system and modifies energy flows and nutrient cycling. In turn these changes affect the ability of ecosystem to support human functions, the quality of human environment and ultimately human well being. This present context of environmental crises raised the need of sustainable explorations for protecting ecological system. It is imperative to derive a method for ecologically designed urban landscape which will be multifunctional and will help to meet the needs of growing population with minimum negative impact on the environment. Derived method / framework will act as a foundation to design multifunctional landscape which will also help to conserve environmental, social, cultural, traditional, economical, heritage, historical value of the region.

Keywords: Landscape, urban development, environment, urban design, sustainable, ecological design.

1. INTRODUCTION

Due to the urbanisation global human population has been shifting from rural to urban and hence land use of agricultural land has been changing. Temperature mitigation, climate control, clean water, clean air, carbon storage these ecosystem services and the natural world that provides them are under estimated or simply ignored throughout land use decision. It disturbs the natural habitat, species composition, alters hydrological system and modifies energy flows and nutrient cycling. In turn these changes affect the ability of ecosystem to support human functions, the quality of human environments and ultimately human well-being. As a result integration between Landscape ecology and Landscape Architecture in both theory and practice is necessary. Landscape Architecture encompasses the analysis of existing

physical conditions, (i.e. topography, hydrology, geology, vegetation) Planning, design, management and stewardship of the natural and built environments. Analysing these site components through the lens of ecosystem services should help to shape the guideline to promote not only ecologically sensitive design, constructions, maintenance but also landscapes that are ecologically regenerative.

1.1 AIM

To study the effects of urban pattern on ecosystem function and identify the role of Landscape as a method and medium for the ecological urban development.

1.2 OBJECTIVES

- To study Driving forces of landscape change
- To study effects of urban pattern on ecosystem function
- To study ecological methods of analyzing the urban landscape
- To study design strategies for ecological urban landscape.

1.3 RESEARCH QUESTION

Can the framework for ecologically designed urban landscape be significantly used in urban planning for future?

1.4 SCOPE

Cities differ from other natural ecosystem. Investigate complex interactions between human and ecological processes in urbanising regions. Derive design strategies to minimize the impact of urban growth on ecology.

1.5 NEED OF THE TOPIC

- To simplify urban ecological design to incorporate intentional change of landscape in cities their mega regions and natural resources.
- To derive principles for applying landscape as a medium and method for urban ecological design which can be used to effect sustainability and to invites creative invention.
- To minimize the negative consequences of urbanisation and create the opportunities for sustainable development of cities which can be a catalyst for global sustainability.

1.6 METHODOLOGY

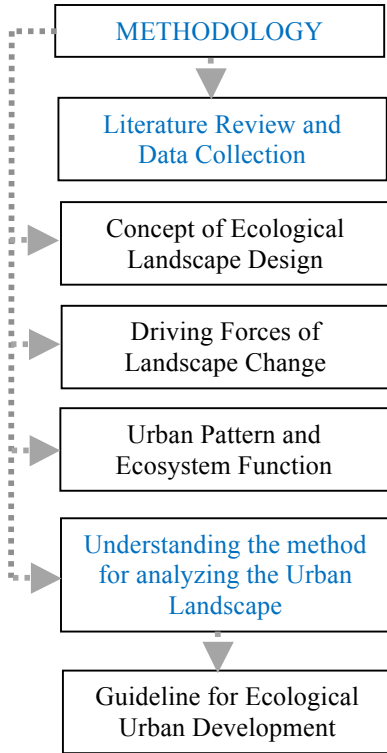


FIGURE1. RESEARCH METHODOLOGY

2. LITERATURE STUDY

2.1. ECOLOGICAL LANDSCAPE DESIGN

Ecological landscape design is based on an ecological understanding of landscape which ensures a holistic, dynamic, responsive and intuitive approach.

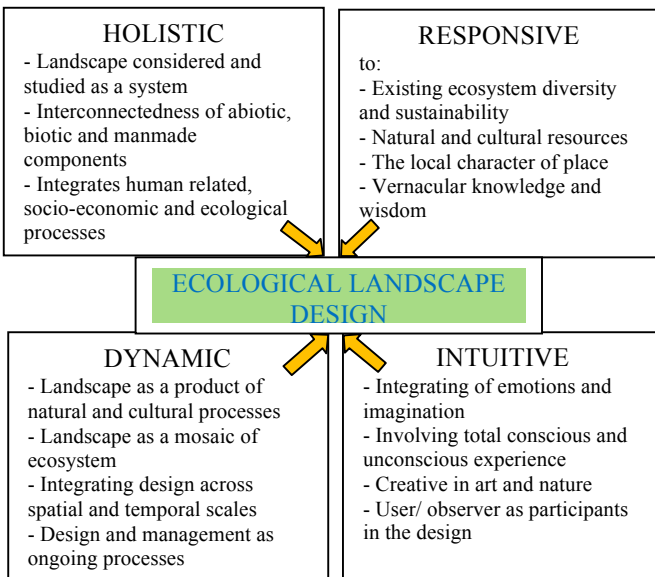


FIGURE2. ECOLOGICAL LANDSCAPE DESIGN APPROACH

Sonali S. Chaskar

2. 2. EFFECT OF URBAN PATTERN ON ECOSYSTEM FUNCTION

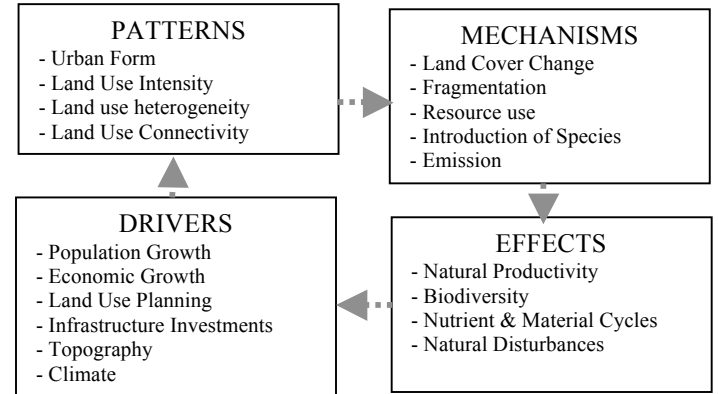


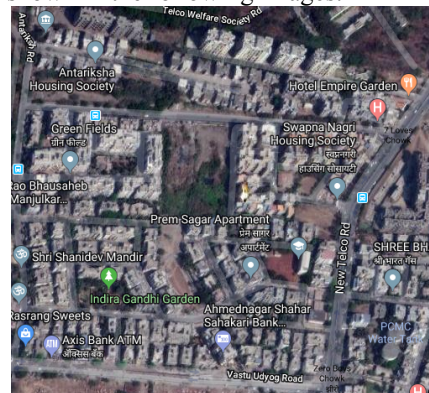
FIGURE3. EFFECT OF URBAN PATTERN ON ECOSYSTEM FUNCTION

- Urban form refers to the degree of centralisation of the urban structure.
- Land-use intensity is the ratio of population to area
- Land-use heterogeneity indicates the diversity of functional land uses such as residential, commercial, industrial, institutional etc.
- Land-use connectivity measures the interrelation and mode of circulation of people and goods across the location of fixed activities.
- Different patch type refers to the percentage of land of a certain cover.
- Percentage land is the sum of the area of all patches of the corresponding patch type divided by total landscape area.
- Mean patch size is the sum of the areas of all patches divided by the number of patches.

3. EXAMPLE

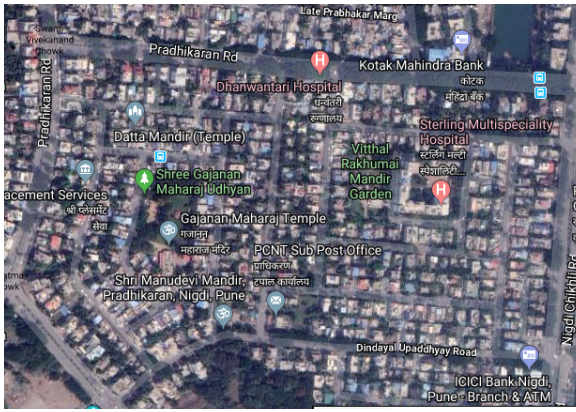
Pimpri – Chinchwad is situated in the sub urban region of Pune city. It has a population of 1.72 million residing in area of 181 square kilo meters. It is well known for its automotive and manufacturing industry.

Different land covers across different land use types are shown in the following images.

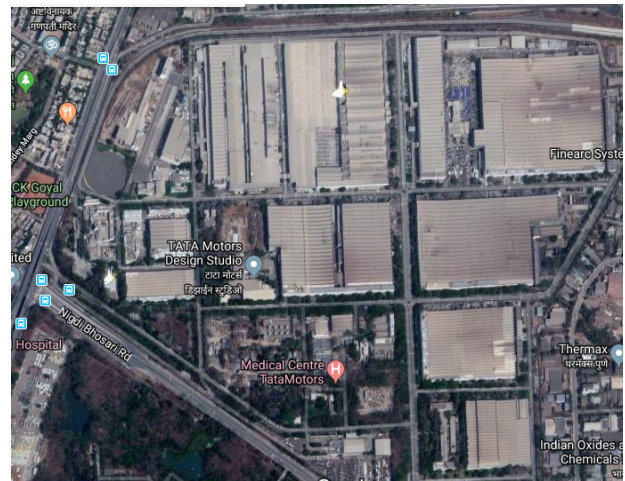


Multi Family Residence

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Single Family Residence



Industrial

IMAGES1. DISTRIBUTION OF LAND COVER ACROSS LAND – USE TYPE

3.1 OBSERVATION

- Complex relationship between land use and land cover in urban landscapes can be revealed by defining the distributions of land cover across parcel with different land uses.
- We can find out the exact percentage of different land covers on different land use parcel and its effect on ecological conditions.
- Single Family Residence parcel have lower amount of impervious surface as compare to Multifamily Residence.
- Land development types have different land covers signatures both in terms of amount and level of fragmentations of natural land cover that can be preserved.

4. FINDINGS

4.1. DIFFERENCE BETWEEN NATURAL ECOSYSTEM AND URBAN ECOSYSTEM

Natural Ecosystem
 - Energy consumption is less

Urban Ecosystem
 - Vastly large amount of energy consumption
 - Lack of integration of habitat patches
 - The invasion of non-native species
 - External control of succession
 - Microclimate – warmer and have greater precipitation
 - Increased run-off
 - Soil – higher concentration of heavy metals & organic matter

4.2. GUIDELINE TO UNDERSTAND THE EFFECT OF DEVELOPMENT PATTERN ON BIOPHYSICAL PROCESSES AND ECOLOGICAL CONDITION

- Characterising landscape in the urban area according to objective measures of composition and configuration.
- Use of these measures to study emerging relationships between landscape pattern and ecosystem dynamics.
- Use of advanced GIS (geographic information system) and remote sensing technique, combined longitudinal, socioeconomic and ecological data sets to extract signatures of development pattern and stimulate future scenario.
- Use of developed metrics for quantifying landscape pattern and their effect on ecological processes.
- Landscape metrics to measure urban landscape pattern used by the other researchers are percent land (PLand), mean patch size (MPS), contagion, Shannon index, aggregation index (AI), and percent of like adjacencies (PLADJ).
 - Percentage land is the sum of the area of all patches of the corresponding patch type divided by the number of patches.
 - Mean patch size is the sum of the areas of all patches divided by the number of patches.
 - The Shannon diversity index represents the number of land use classes in the landscape.
 - Contagion, AI, and PLADJ all measure various aspects of aggregation of the land cover.
- Identify the development pattern which is most effective in supporting ecological function.
- Develop a typology based on real estate type and land development characteristics which include predominant land use, number of units, parcel size and road infrastructure.

5. CONCLUSION

FRAMEWORK TO IDENTIFY THE EFFECT OF URBAN PATTERN ON ECOSYSTEM AND TO DERIVE GUIDELINE FOR ECOLOGICAL URBAN DEVELOPMENT

SR. NO.	LAND USE PATTERN	PATCH TYPE	DRIVERS	ECOSYSTEM FUNCTION	FINDINGS	CONCERN FOR FUTURE DEVELOPMENT
1.	RESIDENTIAL SINGLE FAMILY RESIDENCE / MULTI FAMILY RESIDENCE	Covered with shrubs/ ground cover		- Natural productivity - Biodiversity - Nutrient & material cycle -Natural disturbances		
		Covered with tree canopy		- Natural productivity - Biodiversity - Nutrient & material cycle -Natural disturbances		
		Covered with pervious surface		- Natural productivity - Biodiversity - Nutrient & material cycle -Natural disturbances		
		Covered with impervious surface		- Natural productivity - Biodiversity - Nutrient & material cycle -Natural disturbances		
2.	MIXED USE RESIDENTIAL + COMMERCIAL	Same as above		Same as above		
	COMMERCIAL + INDUSTRIAL					
3.	AGRICULTURE	Type of crop / ground cover		- Natural productivity - Biodiversity - Nutrient & material cycle -Natural disturbances		
		Type of soil		- Natural productivity - Biodiversity - Nutrient & material cycle -Natural disturbances		
4.	OPEN SPACE PRIVATE OPEN SPACE / PUBLIC OPEN SPACE	Covered with shrubs/ ground cover		- Natural productivity - Biodiversity - Nutrient & material cycle -Natural disturbances		
		Covered with tree canopy				
		Covered with pervious surface				
		Covered with impervious surface				
5.	FOREST	Covered with shrubs/ ground cover		- Natural productivity - Biodiversity - Nutrient & material cycle -Natural disturbances		
		Covered with tree canopy				
6.	BARREN	Impervious surface / Pervious Surface		- Nutrient & material cycle -Natural disturbances		
7.	WATER / WATER FRONT	Water / Covered with plants		- Natural productivity - Biodiversity - Nutrient & material cycle		

				-Natural disturbances		
8.	WET LAND	Covered with shrubs/ ground cover		- Natural productivity - Biodiversity - Nutrient & material cycle -Natural disturbances		
		Covered with tree canopy		- Natural productivity - Biodiversity - Nutrient & material cycle -Natural disturbances		

TABLE1. FRAME WORK FOR ECOLOGICAL URBAN DEVELOPMENT

- It is known that there is an impact on ecosystem function due to urbanisation but complex interaction between urban patterns and ecological processes are unknown.
- It is imperative to gain the knowledge about drivers of specific urban region and effect of ecosystem structure and function in urban landscape.
- Based on the existing mapping provided by urban planning and landscape ecology, it is possible to give implementable solution / mechanism to link urban pattern to ecological function.
- We can also investigate how land use intensity and urban pattern interact to affect ecological conditions.
- Depending on the land use type we can suggest the modification in landscape structure and can investigate its interaction with and effect on local ecosystem.

REFERENCES

1. Marina Alberti, The Effect of Urban Patterns on Ecosystem Function, International Regional Science review 2005 28:168-92
2. Mary L Cadenasso, Steward TA Pickett, and Kirsten Schwarz, Spatial Heterogeneity in Urban Ecosystem, Ecological Society of America.

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