



Criteria 3 – Research, Innovations and Extension (110)

3.3- Research Publication and Awards (25)

3.3.2. Number of books and chapters in edited volumes/books published and papers published in national/ international conference proceedings per teacher during last five years (15)

NO	List of Book/Chapter
	2018-19
1	Sustainable landscape Development for Urban Group Housing
2	Cultural Urban Forests: For Sustaining Urban Ecology , Environment and Conservation of Cultural Values .
3	Understanding the Conversion of Existing Agrarian Landscapes into Designed Agro Tourism Destination to Conserve Associated Cultural Heritage and Ecology: Shrirampur Taluka, Ahmednagar
4	Understanding the Character of Open Spaces of an Urban Village on the Urban-Rural fringe of a City, to derive Design Strategies for its Longevity: Nanded Village, Pune
5	Architecture – Beyond Design : Exploring Architectural Profession through Quality Management



PRINCIPAL
Pravara Rural College of
Architecture, Loni

(SSC-18)

NATIONAL CONFERENCE ON
SMART AND SUSTAINABLE CITIES (SSC-18)

22-23 December, 2018



(Sponsored under TEQIP-III)

Organised by



**P.G. Section in Urban Planning
Civil Engineering Department,
S.V.National Institute of Technology
Surat - 395007 (Gujarat)**

Editors

**Dr. Joel Macwan
Dr. Krupesh A. Chauhan
Dr. Ravin M. Tailor
Dr. Chetan R. Patel**

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SUSTAINABLE LANDSCAPE DEVELOPMENT FOR URBAN GROUP HOUSING

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ABSTRACT: “A smart city is an innovative city that uses information and communication technologies (ICTs).” One of the mean of smart city is to ‘establish an environmentally responsible and sustainable approach which meets the needs of today without compromising the needs of future generations’

The aim of this study is to understand the significance of Landscape Sustainability with respect to Landscape Development of Urban Group Housing project. The trend of group housing is spreading at a very faster rate in all developing cities. For these settlements the land use of agricultural land has been changing. A physical and natural characteristic has been changing. But during this transformation a futuristic approach of sustainable development is missing. The sustainable site initiative is therefore creating guidelines to conserve, protect and restore resources, reduce pollution and improve the quality of life and long term health of both communities and the environment.

Objectives of the study are to study the impact of urbanization on natural resources, to study the Parameters of Sustainable Landscape Development, to study various dimensions of and strategies for Sustainable landscape Development and to apply above studies for Sustainable Landscape Development of Group Housing. Data used for this study is collected from various secondary sources. Photographic survey and data collection associated with case studies are done to understand the subject.

The purpose of paper is to derive a framework for sustainable Landscape Development of urban group housing. The paper addresses the role of Designed Landscape as a tool in Sustainable development. The study aims to evolve a sustainability brief and provide a Landscape management framework which can be implementable.

1. INTRODUCTION

The group housing in its modern form is a form of residential community or housing estate containing strictly-controlled entrances for pedestrians, bicycles, and automobiles, and often characterized by a closed perimeter of walls and fences. Group Housing has been, at least initially, an upper class and elite phenomenon in India and

elsewhere. Group housing usually consists of small residential streets and includes various shared amenities. For smaller communities this may be only a park or other common area. For larger communities, it may be possible for residents to stay within the community for most day-to-day activities. Amenities available in Group Housing depend on a number of factors including geographical

location, demographic composition, community structure, and community fees collected.

The trend of group housing is spreading at a very faster rate in all developing cities. For these settlements the land use of agriculture land has been changing. Temperature mitigation, climate control, clean water, clean air, and carbon storage these ecosystem services and the natural world that provides them are underestimated or simply ignored throughout land-use decisions. Landscape has great potential to do environmental good and counter previous damage. The sustainable site initiatives began concentrating on the hydrology, materials, soil, vegetation and human health as related to constructed landscape. Analyzing these site components through the lens of ecosystem services should help to shape the guidelines to promote not only ecologically sensitive design, construction and maintenance, but landscape that are also ecologically regenerative.

1.1. Meaning of Sustainability, Development, Sustainable Development and Sustainable Landscape Development

Sustainability

The term ‘Sustainability’ has been defined variously such as

- Sustainability refers to a process or state that can be maintained indefinitely. 2. Natural resources must be used in ways that do not create ecological debts by overexploiting the carrying and productive capacity of the earth.
- A minimum necessary condition for sustainability is the maintenance of the total

natural stock at or above the current level.

Development

The term development means the social and economic improvement in a broad sense. It is needed to create opportunities, prosperity and choices for all inhabitants of the world and it must proceed in a way that leaves choices available for future generation also. It refers to holistic growth of the human and natural environment towards autonomy and freedom.

Sustainable Development

Sustainable Development combines two terms of ‘Sustainability’ and development to indicate a pattern of growth which strengthens both the national capacities to care for their people in relation to their total relationship with the resources of the earth. The most widely used definition of ‘Sustainable Development’ was given by the Brundtland Commission in its report ‘Our Common Future’ (1987). It defined Sustainable Development as ‘development which meets the need of the present without compromising the ability of future generations to meet their own needs.

Sustainable Landscape Development

Landscapes are the result of people’s interaction with their environment and these are the spaces in and through which people live, work, and spend their leisure time, they are often regarded as common goods even if the land itself and its objects belong to someone. Sustainable Landscape Development is a concept of growing significance. It refers to the role of landscape in sustainable development and also to the sustainable protection, management, and or planning of

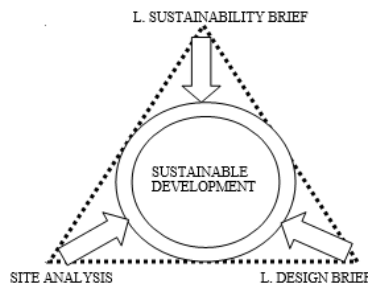
landscapes. Sustainable Landscape Development includes two broad schools – one focused on the design and protection of scenic assets and the other emphasizing dynamic multifunctional links between ecosystem services and human well being.

Table 01: Dimensions, Parameters and Strategies

Sr. No.	Dimensions	Parameters	Strategies
1	Environment	Site selection	Use of appropriate plants
2	Economic	Site Analysis	Managing Soil
3	Social		Waste managements
4	Political		Water Use
5	Aesthetic		Long term vision
Inferences	1. Site planning is the vital components and first step for sustainable development of any type of building activity 2. Site planning includes two stages – a. Site Selection and b. Site Analysis Ideally the design team must be involved in Site Selection and should assess the appropriateness of the site relative to the proposed development. 3. Site analysis brings it upfront all those elements and natural resources that would get affected by the project, are soil conditions if not preserved, hydrology of the site topography and characteristics of land due to hard paving and built up spaces on the site, existing vegetation, solar access and wind pattern. 4. Management of the resources before execution, during execution and after execution is necessary.		

2. CONCLUSION

Fig. 1: Process for the Project



2.1. Various Dimensions, Parameters of and Strategies for Sustainable Landscape Development

Table 02: Landscape Design Brief

LANDSCAPE FUNCTIONAL / DESIGN BRIEF (Site Area 25 Acre)				
Sr. No.	Space	Associated Landscape Element	Activity/Function	Area/No. of Users
1	Entrance plaza	LAND	Entry, Enquiry, Waiting, Relaxing	600 Sq. M.
2	Parking - Visitors – 2 wheeler - 4 wheeler - Resident’s– 2 wheeler - 4 wheeler		Parking	1800 1200 cars
	Open space under parking	LAND		6200 Sq. M.
3	Road Primary Road – 9 m Secondary Road – 7.5m Tertiary Road – 4.5m Total		Connectivity, Facilitate movement	3700 Sq. M. 6610 Sq. M. 7900 Sq. M. 18625Sq.M
4	Pathway		Walking, Jogging	6300 Sq. M.
5	Amphitheatre		Gathering, Meeting, Celebration	1945 Sq. M.
6	Club House with multiuse court		Function, Interaction	2220 Sq. M.
7	Celebration / Interaction		Celebration/Interaction	1600 Sq. M.
8	Children play area Play Area with equipments Play Area without equipments		Playing	980 Sq. M. 1975 Sq. M.
9	Multiuse play court Cricket pitch Basket ball court	Playing	185 Sq. M. 402 sq. M.	
10	Swimming pool Children pool Large pool	WATER	Swimming	52 Sq. M. 305 Sq. M.

1	Water Curtain / Feature wall		Visual Pleasure	2 Nos6 M x 0.35M
1	Plantation Trees Shrubs Ground Cover	VEGETATION	Visual Pleasure	45000Sq.M
1	Terrace Garden		Visual Pleasure	
1	Covered seating / Pavilions	OTHER	Seating, Relaxing, Waiting	
1	Illumination Street lighting Ambient lighting Activity lighting Event lighting			

Table 03: Landscape Sustainability Brief

LANDSCAPE SUSTAINABILITY BRIEF			
Landscape Element		Concern	
LAND	1	Land cut = Land fill	- Natural hydrology of the site - Minimum Soil Erosion
	2	Stripped top soil	Conservation of fertile Top Soil
WATER	3	Top Soil in reapplication	- Conservation of Fertile Top Soil - Vegetative growth
	4	Paved area of the site under parking, road, pathway (Maximum 25% of the site area)	Permeability / water infiltration
	5	Pervious Paving (50% of the paved area)	Permeability / water infiltration
	6	Shaded paved area (Minimum 50% of the paved area)	Heat Island Effect
	1	Use of treated waste water (More than or equal to 50%)	Reduce use of Potable water
	1	Rain water harvesting from roof area (Minimum 50%)	Water conservation
	VEGETATION	1	Protected existing vegetation
1		Plantation for soil stabilization	Soil erosion control
1		Plantation for windbreaks and shelterbelts	Protection from Wind & Sun
1		Plantation for pollution control	Microclimate moderation
1		Productive	Economic

	7	vegetation	sustainability
	1	Roof / terrace garden (more than or equal to 50%)	Heat Island Effect
	1	Area under plantation	Heat Island Effect
	2	Drought resistant plantation (more than or equal to 20%)	Optimum use of natural resources
	2	Native plantation	Maintenance
	2	Water requirement for plantation	Water conservation
OTHER	2	Proximity of the site from public transit / household services and amenities (within 1 km)	Time, Fuel, Money consumption
OTHER	2	Use of compost manure (Treatment to domestic waste + landscape waster)	Optimum use of Natural Resources
	2	Use of Solar Lighting	Energy Conservation

Table 04: Landscape Management Framework at Pre-Execution Stage

LANDSCAPE MANAGEMENT FRAMEWORK AT PRE EXECUTION STAGE			
S t a g e s	Type of Work	Concern	Purpose
1	Site analysis	Soil, Air, Water, Solar access, Building sitting	- To study impact of development of the project on ecology and available resources on site. - To apply mitigation options to reduce the negative impact on the resources.
2	Suitability and zoning	Existing natural resource - Relation between built-up and open space - Solar access	Optimum use of natural resources - To facilitate functional requirement
3	Landscape design	- Sustainability Brief - Functional Brief	Optimum use of natural resources. - To facilitate functional requirement.
4	Staging / phasing	Separation of undisturbed land from disturbed land	To divide a construction area into two or more areas - to minimize the area of soil that will be exposed

			- to separate water runoff so that pollutants from the construction area do not mix with storm water runoff from undisturbed area.
5	Top soil conservation	- Top soil removal and preservation (stockpile) - Location for stockpile	- To control soil erosion during construction stage and post construction - Reapplication of soil to site during plantation of the proposed vegetation.
6	Preservation of existing vegetation	Documentation of existing vegetation (area, species, number of trees) - Minimum vegetation clearing. – Define the area where trees need to be Protected, Preserved Transplanted and removed	- To prevent disturbance or damage to specified areas during construction. - To minimize erosion potential, protect water quality, and to provide aesthetic benefits.
7	Water conservation	Minimize storm water runoff	To capture and to reuse storm water for existing landscape irrigation
8	Schedule of work	Weather / climatic condition	To schedule appropriate timing and sequencing of construction considering weather condition to protect natural resources on site

Table 05: Landscape Management Framework at Execution Stage

LANDSCAPE MANAGEMENT FRAMEWORK AT EXECUTION STAGE			
Stages	Type of Work	Concern	Purpose
1	Staging / phasing areas	Separation of undisturbed land from disturbed land	To divide a construction area into two or more areas - to protect existing vegetation - to minimize the area of soil that will be exposed -to separate water runoff so that pollutants from the construction area do not mix with storm water runoff from undisturbed areas.

2	Civil work	Emission (dust, noise and vibration) generated during construction	To protect the existing natural resources on site
3	Laying of services	- Water conservation - Reduction in water demand for landscape - Waste water management - Rain water harvesting - Domestic and landscape waste management	Optimum use of available natural resources
4	Finishing work	Consumption of resources Transportation cost Consumption of materials Life cycle cost of materials	To capture and to reuse storm water for existing landscape irrigation
5	Top soil laying	Reapplication of stockpile top soil	To provide suitable soil medium for vegetative growth
6	Plantation	Native plants, Drought resistant plants	- Plantation for -Soil stabilization - Windbreaks and shelterbelts - Pollution control - Productive vegetation - Visual pleasure

Table 06: Landscape Management Framework at Post-Execution Stage

LANDSCAPE MANAGEMENT FRAMEWORK AT POST EXECUTION STAGE			
Stages	Type of Work	Concern	Purpose
1	Hardscape – road paved areas and Pathways	Cleaning / Sweeping	
2	Softscape - tree plantation - shrub plantation ground cover – soil,	- Collecting leaf litter - Watering - Cutting /Trimming - Fertilizers - Seeding	- Cultivated vegetables - Plant Nursery - Guava orchard - Under plantation

	sand, grass		
3	Services - Storm Water Management - Rain water Harvesting - Irrigation . Drip irrigation . Sprinkler irrigation . Swimming pool / filtration plant - solid waste management . Biodegradable . Non-biodegradable . Hazardous - Illumination . Electrical, Solar	- Maintenance of fixture - Cleaning of chambers	- Swimming pool - Biodegradable waste management
4	Elements - Swimming pool - Feature wall - Pergola - Children play equipments - Seats	Cleaning Repairing Painting	Swimming Pool Components - A basin - A motorized pump - A water filter - A chemical feeder - Drains - Returns - PVC plastic plumbing connecting all of these elements

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CULTURAL URBAN FORESTS: FOR SUSTAINING URBAN ECOLOGY , ENVIRONMENT AND CONSERVATION OF CULTURAL VALUES

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ABSTRACT: From anthropological, ethno botanical and linguistic studies it is observed that, along with environmental and ecological values, forests has cultural significance in Indian Culture. Forest areas provides important habitat for wildlife, ranging from small insects to wild animals and term Cultural Urban Forest refers to forests in urban areas having planting policy and activities based on Indian festivals and rituals. This paper is aiming To Study Evolution of forest as per chronological order of Indian landscape and Hindu scripts for , understanding need and cultural values associated with forests Methodology would be conducted through literature review of evolution of forest from Agni purana (4000 years ago) to Post Independent era. Study is limited to chronological order of Indian landscape and Hindu scripts. Term Cultural Forest would also help to revive different terminologies have been used in ancient times. This study will act as a guideline for forest department and NGO's for planting policy. Such city greens can also be act as socio cultural gathering and festival celebration spaces. Also will provide nesting sites for birds, butterflies and other insects in future. Indirectly the study would throw light on conservation and enhancement of cultural species, Culture and can rebuilt neighbourhood relationships which is been lost now days, Negative impacts of deforestation and project public awareness and participation.

KEYWORDS: Urban Forest, Ecology, Environment ,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 abiotic.

Cultural urban Forest could be important element in development of new cities for making them smart in terms of culture, ecology, environment.

1.1. Aim

To Study Evolution of forests as per chronological order of Indian landscape and Hindu scripts for, understanding need and cultural values associated with forests. .

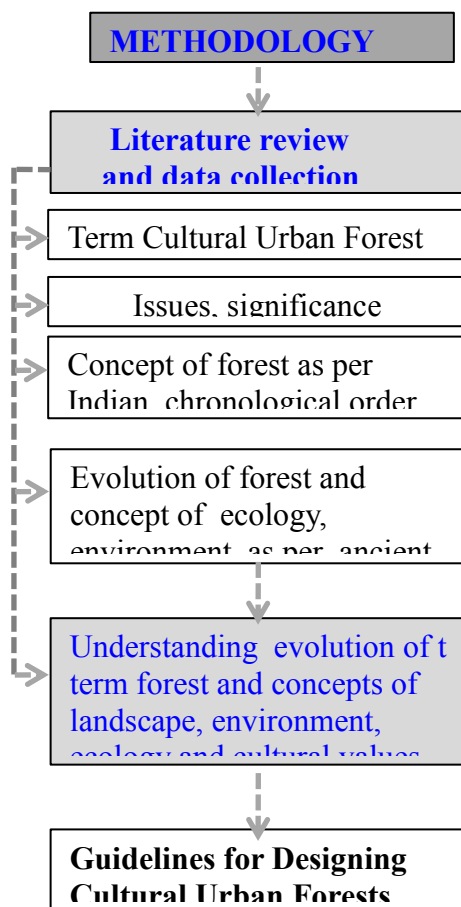
1.2. Objectives

- 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.

1.3. Scope

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

1.4. Methodology



1.5. Need of the Topic

Lack of residential spaces in core city areas and increasing need of shelters, cities are expanding in outskirts areas, Hence outskirts of the cities are under high risk of green hazard. These areas serves as food systems to human being in the form of agrarian landscapes and green spaces provide shelters for wildlife. Another issue of developing cities is need of smart infrastructures within the city, which is disturbing ratio between hardscape to softscape. These issues together resulting in imbalance of urban ecology and environment. Which is impacting on wildlife and ecology. Due to westernisation 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 culture and will give different identity to city for making it smart.

2. OBSERVATION AND FINDINGS

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

	Concept Of Forest, Landscape, Ecology, Environment, City Planning	Findings, Contributions
1	<i>Agni purana- 4000 years ago</i>	
	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>i. Mahavan-</i> great natural forest-Equivalent to protected areas of today.- It adjoins the village & provides a place where all species can coexist.</p> <p><i>ii. Banwari / Shrivan-</i> 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><i>iii. Tapovan- Forest of religion.-</i>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	
	<p>The Hindu idea is that, whole world is forest, to keep this world as it is, they have to keep the world forest intact</p>	<p>The concept of cultural landscapes such as sacred forests and groves, sacred corridors & variety of ethno forestry practices that mirror the “ecosystem” like concepts.</p>
b .	Post Vedic period	
	<p>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.</p>	<p>Temple forest, monastery forest, sacred trees</p>
c .	Manusmriti- Post Vedic period	
	<p>Religion plays diversified role in saving the integrity of the natural environment. Importance was given for conserving and domesticating animals, biodiversity protection,</p>	<p>Ecological awareness</p> <p>Biodiversity means all living forms broadly ascribed as chara (movable living world) and achara (immovable: plant</p>

	<p>and vegetarian food habit</p>	<p>kingdom).</p> <p>Pollution refers to spoilage of the five gross elements by unethical activity.</p> <p>Contamination refers to any action against wholesomeness (soucha)</p>
d .	Caraka-Samhita and Susruta-Samhita	
	<p>Charaka and Susrata classified lands according to the nature of the soil, climate and vegetation into three categories:</p> <p>Jangala, or the region of open spaces where a steady dry wind blowed.</p> <p>Anupa, or the marshy tract bordered by seas, where cold wind and networks of rivers prevailed.</p> <p>Sadharana, or the intermediate regions which had some of the features common to the other two regions.</p>	<p>The common plants of the Jangala region were khadira (acacia catechu), asana (terminalia tomentosa) and badari (zizyphus jujuba).</p> <p>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.), Jalandi (algae) and saivala (moss).</p> <p>The common plants of intermediate regions were mandara or parijataka (coral tree) and santana (kalpa tree).</p>
	<p>Vedic people assimilated new environmental values and the concept of “sacred groves”, productive aspects of forest vegetation was emphasised</p>	
	<p>Chandra Gupta Maurya : 322-185 BC</p>	

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 Arthashastra 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	
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.
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.	They cleared vast areas of forests to make way for settlements. The Muslim invaders were all keen hunters and therefore had to have patches of forests where they could go hunting
The Mughals -1483-1757 A.D	
They showed more interest in gardens and their development.	Akbar ordered the planting of trees in various parts of his kingdom. Jahangir was well known for laying out beautiful gardens and planting trees

3. ACTIONS AND IMPACTS

Table 2 Containing Actions taken against forests during British rule to Post independent era and their impacts on forests and city

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

	<p>the forests were made, with many areas undergoing regeneration and sustained harvest plans being drawn up.</p> <p>ii. Emphasis was still not on protection and regeneration but on gaining maximum revenue from the forests.</p> <p>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.</p>
1947	<p>i. A great upheaval in forestry organization occurred.</p> <p>ii. The princely states were managed variably, giving more concessions to the local populations.</p> <p>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.</p> <p>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.</p>
9	Post Independent Era
1952	<p>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.</p> <p>ii. Certain activities were banned and grazing restricted.</p> <p>iii. Much of the original British policy was kept in place, such as the classification of forest land into two types.</p>
1976	<p>i. The governance of the forest came under the concurrent list.</p> <p>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</p>

	<p>with the tribal economy. But a large gap between aim and achievement exists still.</p>
--	---

4. CONCLUSION:

The traces of correlation between forests and human being was first mentioned in *Agnipurana* (4000 years ago) which states that, forests were used for materialistic use. In the Vedic Period attention was given to biodiversity protection, ecological awareness, conservation and concept of cultural forest, scared groves. During Chandra Gupt Maurya's period intent of the forest was revenue generation by using different forest management and protection techniques. In Ashoka's period mass plantation of trees in large area was started. Muslim period was the beginning phase of migration to the forest. They have cleared patches for forests to make roads path up to their settlements. From Muslim Period forests got disturbed and it was begining of deforestation. In Mughal Period Focus was on garden designing. Above chronological study shows that, from Mughal period planning, management and conservation of forest landscapes got vanished and trend of garden designing and beautification was emerged. 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 period lost their identity and religious native species was replaced by monostands of tectona grandice. During world war-I deforestation was continued. In post independent era, policy of forest protective function of forest was established for maintaining one third part of India's land.

In current practice we are lacking behind to follow concepts of forests based on their functions which is derived by Vedic and Indus valley civilizations. Which were actually based on our cultural activities and attention was given on conservation, ecology and environment. Hence, holistic approach is needed to replant 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 smart and culturally rich.

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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Understanding the Conversion of Existing Agrarian Landscapes into Designed Agro Tourism Destination to Conserve Associated Cultural Heritage and Ecology: Shrirampur Taluka, Ahmednagar

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Abstract: *Traditional agrarian landscapes form part of cultural and natural heritage, ecological integrity and scenic value of landscapes make rural areas attractive for the establishment of enterprises, places to live, tourism and recreation businesses. Agriculture and Tourism brings in together booming sector now a days, called Agro Tourism. This research focuses on understanding the character of Agrarian Landscapes and planning, designing of agro tourism destination, for conservation and enhancement of existing habitat and Temple. Offering new employment and income generating opportunities for rural populations, including agro tourism as expression and cultural exchange of agricultural practices, artistic heritage, craftsmanship, culinary traditions.*

Keywords

Agrarian Landscapes, Agro Tourism Designing, Ecology, Heritage, Habitat, Conservation

Introduction To The Topic

The first dimension of Agro- tourism is the agriculture. Agriculture, earlier in the broadest sense, included activities aimed at the use of natural resources for welfare of the human being and it included all primary activities of production. However, agriculture generally means the growing and raising crops and livestock. Over the years it has emerged as an enterprise that encompasses all production activities integrated on commercial lines to maximize profits at minimum costs on bases. Agriculture is backbone of Indian economy. Majority of our country lives in the rural areas. Approximately 70% of the Indian population is dependent on Agriculture And allied fields. Hence it is the largest part of our economy. This sector's contribution towards GDP is decreasing and farmers are finding it difficult to carry the agricultural activities without an additional income. It is observed that excesses of modern agriculture technologies causing damages to the local ecology. The returns from farming are slow and low of which the price is determined not by the farmer but somebody else.

The second dimension of the concept in agro -tourism is related to Ecosystem which include biodiversity, organic farming systems, and ecological systems, Hence agro-tourism means **making little environmental impacts** as far as possi-

ble, help to sustain the indigenous populace, thinking and encouraging the preservation of wild life and habitats when visiting the places. Farming activity is a key factor in shaping the visual features of rural areas and creating valuable habitats for wildlife.

Aim

To design an agro tourism destination and conserve associated cultural heritage and ecology.

Objectives

- To study tourism profile of Ahemadnagar district.
- To study Connectivity & Road Network pattern.
- To study agricultural profile of Ahemadnagar district

Scope

Study focuses on planning & designing of agro tourism destination To conserve & enhance existing habitat for peacocks & other wildlife associated with the site.

Limitations

Scope of the the study is limited to only Khandala village.

Need Of The Project

The combination of agriculture and tourism, under the scope of a rational development, may help towards a sustainable way of maintenance and planning of the rural landscapes. Farming activity is a key factor in shaping the visual features of rural areas and creating valuable habitats for wildlife.

Agro tourism is developed as a sector with the aim of not only a development instrument for local people who are dependent on agricultural production, but also for sustaining the agricultural lands. Since few years the expected yield has reduced affecting the monetary returns obtained from farming, hence additional resources are needed for bread and butter in agrarian communities also in many areas, farming practices and land management associated with highly valued landscapes are at risk. By proposing such a project we can conserve it. Indirectly, the study would throw light on how to reduce the rapid growth of urbanization and negative impacts on villages and project public awareness and participation.

Study Area

Khandala village is a tourist place in Shirampur taluka, District Ahemdnagar. Famous for ganesh temple and it is believed that the idol of lord Ganesha is self embedded. The temple is surrounded by agricultural fields & peacocks are seen in this area.

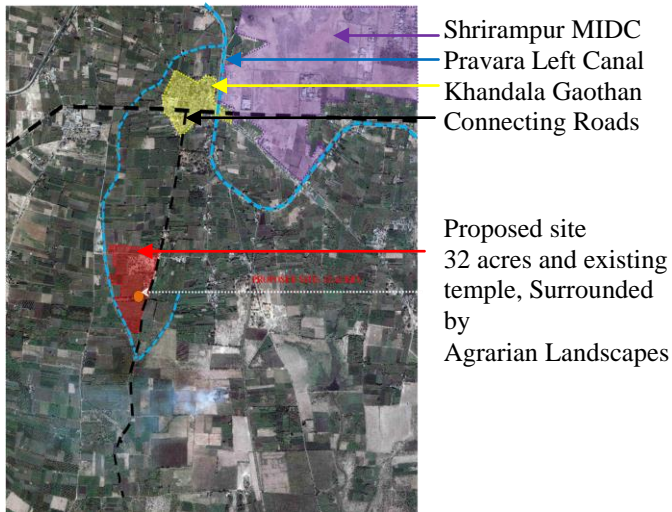


Fig No-1 showing proposed site , surrounded by agri fields, connecting Roads and major landmarks

Methodology

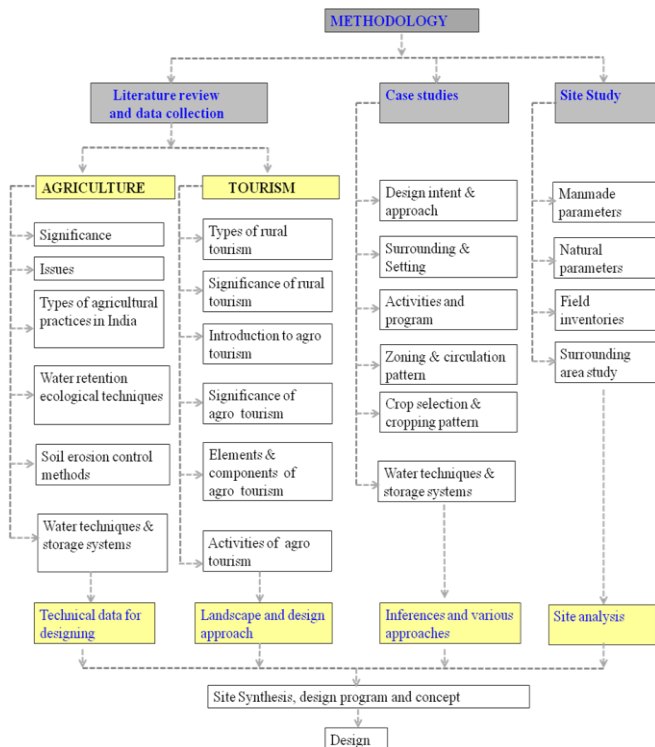


Chart No-1- Methodology

A. Literature Study

Literature study is conducted through reading books, research papers etc.

1. Agricultural Profile

To understand the significance and issues at regional level, different types of Agricultural practices based on geographical locations of India, different types of water techniques and storage techniques adopted according to region and climatic conditions, ecological methods for soil erosion control, Cropping Pattern Of Ahemadnar District.

2. Tourist Profile

This study is conducted through interview and reading method. To understand and study types of tourism, significance, elements of agro tourism, Division wise Norms for agro tourism designed by MART (Maharashtra State Agri Rural Tourism), Tourist profile of Ahemadnar District.

B. Case Studies

This study is conducted through books and live case study. Mapping, Interview method and observations in case of live case study. Case studies has been selected by having certain parameters such as setting, intent of project, scale. To understand Design approach, activities and program briefs, zoning , circulation, services , Movement Pattern, Crop selection, Natural parameters, Water Requirement.

C. Site Study

This study is conducted through site visit, field inventories, survey, mapping , interview method. To study manmade parameters like Visual, Aesthetic, View Corridors, Economic, Social, Cultural, Religious, Cultural/Religious/Heritage Value , Functional, Human Ownership, Physical Connectivity Built Form. To study natural parameters of region for understanding of Soil Type, Rainfall, Hydrology. Slope, Relief, Hydrology, Vegetation study at site level to derive a synthesis map.

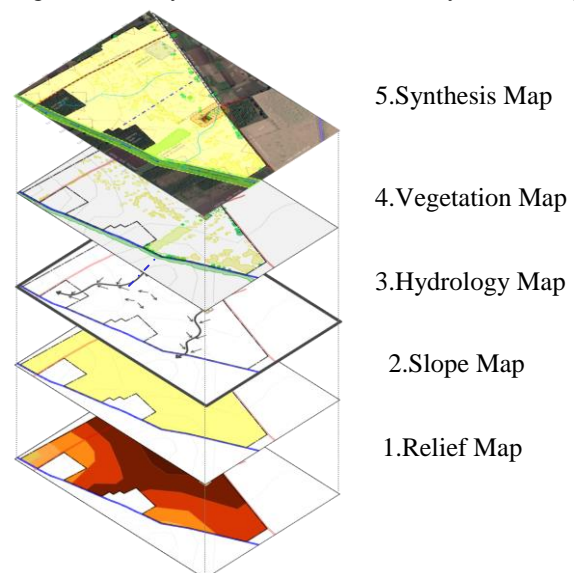


Fig No-2 Showing Layers Of Site Analysis

Findings and Conclusions

Results of Literature Study , Case Study Analysis, Site analysis are as follow.

No	Parameter	Result
A Literature Study		
1	Agricultural profile	Rabbi crop- jowari, wheat, gram, maize. Kharif crop- bajara sugarcane, maize. -summer crops- groundnut, mug. Highly suitable slope for all the crops is <3m, sprinkler, flood water, drip irrigation are irrigation methods used, maximum crop duration is 4 months for each crop, sugarcane require 2-3 years.
2	Tourist profile	District is having presence of tourist attractions like Religious, Wild Life, Nature, Heritage , Agriculture. Religious tourism is the main typology which is observed in the district.
B Case study		
	Book case study	In case of technology park emphasis was given to different cultivation and Experiments, site setting plays an important role in formulating design brief of project, cropping pattern etc
	Live case study	Zones were divided in following manner 80% agricultural zone,18% tourist zone 02% of educational zone Agricultural zones were totally segregated from tourist zone. Limited areas of the agricultural zone were accessible to tourists. Maximum area under orchard plantation
C Site Study		
1	Manmade parameters	Experience of agricultural lands and orchards while going to temple from Sangmner road, view dry and barren land and agri fields. Acting as a tourist point. Farmers come and sale their products on chaturthi day, when devotees come for worshipping. Temple area has been used for religious, recreation activities and social gatherings.
2	Natural parameters	District is having black catton soil , medium deep black soil. Elevation height of taluka is between 300m-600m, from mean sea level. Shrirampur taluka receives rainfall between 500mm-800mm . District falls under scarcity zone. According to agro climatic zones of district shrirampur lies in scarcity zone. Other than rainfall taluka get manmade water supply from Pravara left canal built on Bhandardara dam. Site is having species like, neem, coconut, vad, pimpal, audumbar, mango, babul, sub-abhul,chandan, lal chinch and overall site has 0-2% slope.

Recreational, conservation of communities like pot maker, stone mason, Bangle saler (kasar),Folk dancers, Village jatra , existing temple, habitat associated. Concept is Celebration of Hindu festivals as per Marathi calendar and agrarian seasons (Kharif, Rabbi, Summer), to conserve traditional systems, which is been derived from site context.

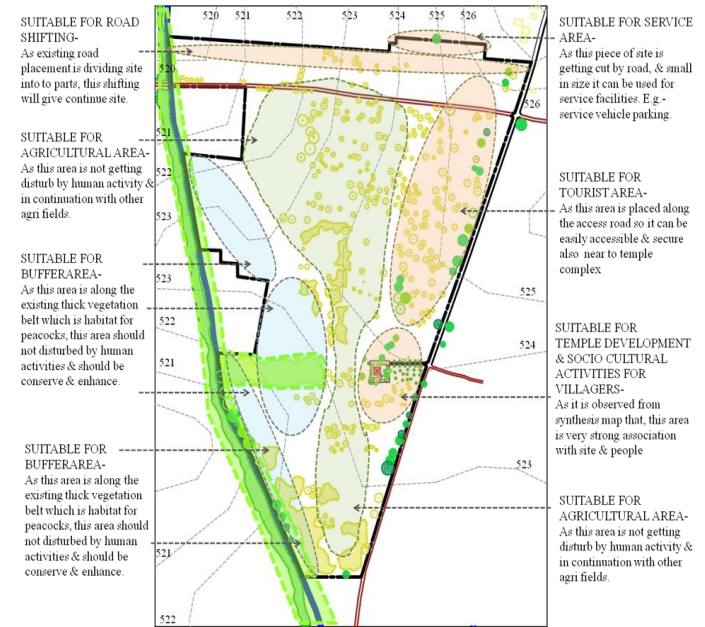


Fig No- 3- Suitability Map Derived from Synthesis Map Showing area suitability for activities.

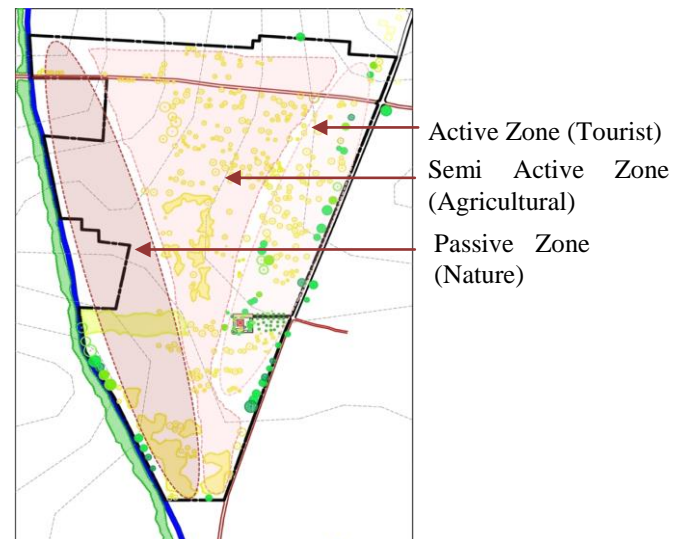


Fig No- 4- Zoning Map Derived from Suitability Map

Tourist zone is placed in such a way that it is easily approachable have minimum disturbance to agri zone and nature zone. Planting pallet for this zone has been selected by studding cultural importance of plants in Hindu festivals. Flowering species has been studied according to their blooming season wise and planted along that months festival celebration area or activity zone.

Final Design Output

From all the base study site has been divided into three zones Tourist zone, Agricultural zone and Nature zone. Design approach for this project is informative, Educational,

Nature zone has been placed and design in such a way that, minimum human intervention will happen in this area. It is combined with existing grove of *Caesalpinia bonduc* which is habitat for peacocks and many other birds on site. one existing water canal is present along these groves, which get waters twice a year. Such a water feature is helpful for developing and conserving bird and other fauna. Hence, to get water throughout the year, longitudinal trench has been designed which will also prevent direct human intervention with grove of *Caesalpinia bonduc*. Three storied plantation, fruit and flower bearing species has been selected for this zone, for enhancement and conservation of existing fauna.

Acknowledgement

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Fig No-5-Final landscape layout for Agro Tourism Dstination.

Agricultural zone is placed in such a way that it could act as a buffer between nature zone and tourist zone. Agrarian landscapes are ever changing due to production of kharip, rabbi, summer seasonal crops, hence for, visual character of each piece of land would be different in each season. Orchards will act as transition between these two zones.

Understanding the Character of Open Spaces of an Urban Village on the Urban-Rural fringe of a City, to derive Design Strategies for its Longevity: Nanded Village, Pune

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Abstract: *Urban villages are hinterlands trapped in an urban premise; which are engulfed in the surrounding development. Their association with the natural parameters, which initiated their settlement, are lost. Nanded village on the fringes of Pune city is one such settlement, which in spite of having historical significance, productive soil with association of water bodies like river and stream, is facing similar issues of surviving in the peripheral development. The paper aims to analyse the condition of existing open spaces left in the village for deriving workable strategies, to determine its permissible usage and establish a role in the village upliftment.*

Keywords: hinterlands, urban premise, fringe, engulf, strategies, upliftment

I. Introduction

A specific category of settlements of the urban poor in the city can be termed as *the urban villages* or *the gaathan areas*. They grow like fungus in an otherwise manicured landscape in the vicinity. Their association with the natural parameters, which initially embarked their settlement, are lost, and they inhabit in isolation. These are dense settlements with intense issues related to the livelihood. They are original villages that have adapted to the current development pattern in their vicinity and have submitted to the paradigm shift. The cities spread out gradually to the hinterlands due to the increasing pressures of population; the villages on the urban-rural fringe transform at a slower pace. This extension engulfs the villages, acquiring their agricultural lands and bringing change in the occupational pattern of the villagers. This leads to a revolutionary change in the economic base of the community. In India, the urban villages are existing pockets of villages which have got cramped among the rapidly rising city around them, leaving these villages at the mercy of their own growth. They lack in basic facilities such as roads, water and sanitation, haphazard construction with buildings serviced by narrow streets. The urban village is where the prime change happens in the landscape component. The main areas where the transformation is seen are:

- Transformation of major landscape elements (water body, hills, natural flora & fauna, soil, etc.)
- Transformation of infrastructure elements (schools, commercial centres are built in the urban village)
- Transformation of land uses (change from agricultural land-use to residential/industrial/recreational land use)

- Transformation in occupational structure (people shift from working in agricultural field to working in the informal sector in the city)

- Transformation in social structure^[1]

One of the approaches to organise the development and transformation of such villages is by adopting green infrastructure (GI) networks. This study of the village is a representative case of developing strategies for the existing open spaces in such left out patches of settlements. This would give the village an identity which would minimise the social barrier they face with the inhabitants in the surrounding new development.

Aim:

To develop strategies for the different character of open spaces found in the urban village through green infrastructure methods for making the village self sufficient, improving the quality of life.

Objectives:

- To study the evolution of Nanded Gaathan
- To understand user preferences by conducting interviews of the residents
- To understand the suitable green infrastructure methods which can be adopted considering the requirements of the open spaces

Scope:

The open spaces of micro to macro scales are identified within the village, the characters are studied and strategies are suggested for it to become self-sufficient.

Limitations:

- The study is limited to the extent of Nanded Gaathan.
- The strategies are given catering the entire gaathan and considering the requirements of the villagers.
- The proposals are given at the strategic locations after analysing the site and considering the constraint of open spaces.

II. Methodology

Literature Review	Case Studies	Observations
<ul style="list-style-type: none"> Referring to published articles and books exploring the concept of 'The Urban Village' Studying policy framework for Green Infrastructure in India 	<ul style="list-style-type: none"> Three cases of different contexts <ul style="list-style-type: none"> a) 2 of Model Villages <ul style="list-style-type: none"> Ralegan Siddhi Hiware Bazaar b) 1 of Project 'Garbage to Gardens' by Manda Karlsson and Annie Soder Inferences 	<ul style="list-style-type: none"> Photographic documentation Interview of Villagers Data procured from site, summarised in sheet Site Analysis Identifying potentials for landscape interventions List of requirements from the site Policy framework and Design strategies for the Site Design intent, landscape proposal

Figure 1 – Methodology Table

- Literature study:**
 Studying the concept of Urban Village through research articles and books; understanding Green Infrastructure techniques.
- Case Study:**
 Three case studies were selected, two based on model villages and one based on transition of an open space used for sorting garbage into a garden.
- Observational study:**
 Analysis of site through Photographs, Interviews, Natural parameters, Manmade parameters, Activity mapping, Identifying open space structure and its analysis

On the basis of literature review, case study and site analysis, giving demonstrative design strategies for the identified open space structure was the next stage.

i. Literature Study:
Green Infrastructure [2]

Table 1: Attributes of Green Infrastructure

Natural ecosystem values and functions [biodiversity, ecological processes, and ecological services]		
Attributes	Examples of places	Examples of functions provided
Fish and wildlife resources	Wildlife refuges, landscape linkages / wildlife corridors, ecobelts, streams and lakes	Provide habitat for wildlife, support animal migration, maintain population health
Watersheds or water resources	Riparian or stream buffers, wetlands, flood plains, groundwater recharge areas	Protect and restore water quality and quantity, provide habitat for aquatic and wetland organisms
Associated benefits to human population [ecological services,		

societal values, and economics]		
Recreation and health resources	Parks, greenways, blue ways, trails	Encourage exercise and active lifestyles, provide space for outdoor activities, create places for solitude and respite, connect communities, connect people with nature, provide alternative transportation
Cultural resources	Historic or Archaeological sites, educational sites / facilities, town / country open spaces	Preserve link to cultural and natural heritage, foster education through 'nature classrooms', protection of cultural site / integrity
Working lands with economic values	Farms, orchards, ranches, managed forests	Protect working lands as a business as well as a place; maintain rural character and traditions, support sectors of the economy.

ii. Case Studies:

Two case studies representing Model Villages were referred, namely Ralegaon Siddhi and Hiware Bazaar both from Ahmednagar. Issues faced by the village then were:

- Acute water crisis, reason being village cited in drought prone and rain shadow region
- Limited seasonal agriculture
- Unavailability of fodder and fuel wood
- Forced migration of the farmers to surrounding towns and cities in search of work
- Deprived of its only source of income – agriculture
- Residents turning to local liquor production, giving rise to vandalism
- Lacked in basic facilities of primary education and health

To mitigate these issues the principles enforced and implemented in both the villages were:

- Watershed Management
- Use of non-conventional energy resources
- Shramdan
- Ban on Grazing
- Ban on Tree cutting
- Ban on Liquor
- Family Planning
- Voluntary Labour

Another case study referred to was a study done by Manda Karlsson and Annie Söder, who gave design proposals for two decentralised waste management units in Pune, India and

published their work under the title ‘Garbage to Gardens’. One of their sites in Pune was a small area currently used as sorting space for the disposed household dry waste. The main approach was to improve the work conditions of the rag pickers, by providing a substantial shade to protect from sun and rains, and give it a tidy appearance to improve the hygiene of the place^[3].

III. Site Survey

About the Site:

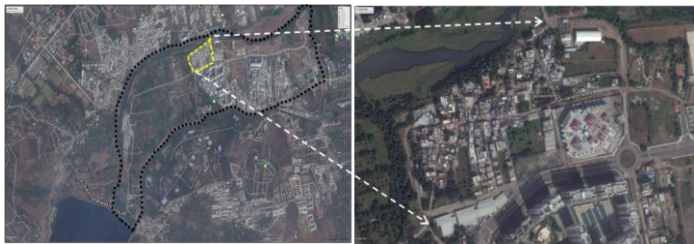


Figure 2 - Nanded Gaathan Boundary: 25 acres

Pune’s urban area has been expanding on an average rate of about 500m per year for the last two decades or so. Human habitations are encroaching upon the farm land, orchards on fringes, affecting the riverine habitat the most. In this rapid urbanization, the villages on the fringes get transformed, forming urban villages or gaathan. One such urban village is Nanded Gaathan, in the vicinity of the upcoming Magarpatta’s Nanded City township situated 8kms towards South from Pune City. The area is 25 acres catering 2669 households. The site gradually slopes towards the river. In the past peoples association has been the strongest towards the river and the stream.

The Surveys:

The surveys were conducted at two levels, for children and adults. The conclusions brought a better understanding of the association of the people with the different forms of water bodies in their vicinity; their lifestyle and their preferences of the activities at the river front. People’s choice of activities and their understanding of the current open spaces helped derive the strategies.

Percentiles of people’s opinion on the kind of riverfront activities

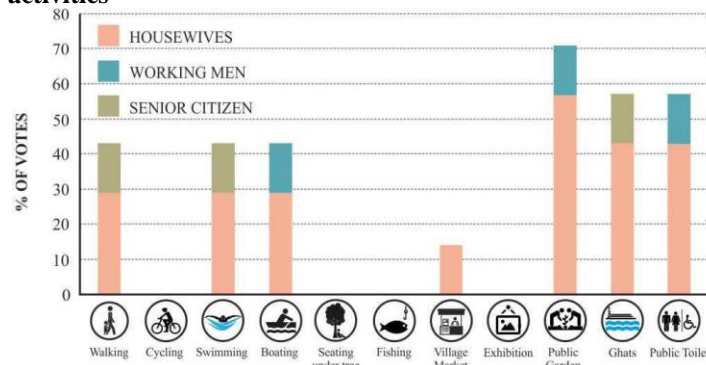


Figure 3 – Bar Chart showing people’s preference

The graph represents the activities given to the people for choosing their preferences, the group was deliberately categorised as ‘Housewives’ ‘Working Men’ & ‘Senior Citizens’.

A cumulative highest vote came for ‘Public Garden’ followed by ‘Ghats and ‘Public Toilets’ It was concluded from the survey that people need allocated open spaces apart from recreation as it forms an integral part of their everyday life.

Percentile of students’ preference on the kind of riverfront activities

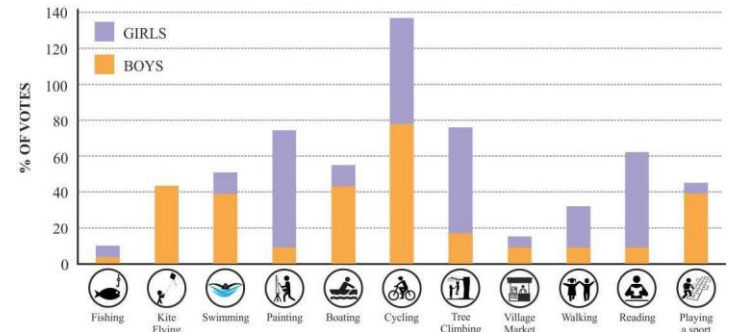







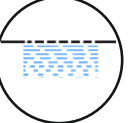
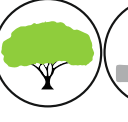






Figure 4 – Bar Chart showing students’ preference



The survey was conducted to understand what children preferred the most if the existing river front was restored. A mixed age group of 10 years was selected from the Zilla Parishad School, the only one in the vicinity. The cumulative vote went to ‘Cycling’, followed by ‘Tree climbing’ and ‘Painting’ chosen by the Girls and ‘Kite Flying’ and ‘Boating’ chosen by the Boys. Many students shared how these activities were once a part of their growing up years, which now has faded since degradation of natural resources and infrastructure.






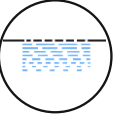

IV. Results and Tables

Table 2 – Open Space Character Analysis with Proposed Strategies

1) TYPOLOGY		RIVER	
Available Open Spaces		River & Riverfront	Pot-holes
Ownership		Irrigation Department	Irrigation Department
Existing Use		Seating spaces, Crematorial activities and Visarjan activities	Drying of clothes & cow dung cakes
Approximate Area		0.53 km stretch	-----
Conce rn	Functional	●●●●	
	Social	●●●●	
	Visual	●●●●	
	Environmental	●●●●	
Policy	Activities	Ban on polythene bags, Ban on dumping waste into the river, Provision of bio gas plant, Ghats, Fine levied, Restricting air pollution, Restricting noise pollution, Maintenance of Public Toilets, Cow dung collection Bank, Public Garden, Collection bank for Nirmalya, Ban on cattle washing, Fishing, Bio swale along the streets, Cycle track, Domestic waste water segregation at the point of generation	

	Techniques	  Waste Water Treatment Rain Water Harvesting   Weed Management, Removal of pollution tolerant species Stormwater Management
	Built	Prohibition of built spaces in between the 25 year flood line, Low rise built spaces, Maximum 6m height, in the upland area of the river
	Material	  Eco-friendly Materials Pervious Materials
	Planting	   Large Canopy Evergreen Floriculture & Hydrophytes Flowering Fragrant Species
2) TYPOLOGY		STREAM
Available Open Spaces		Open Spaces Along The Stream
Ownership		Irrigation Department
Existing Use		Stream, Resting place, Fishing
Approximate Area		0.4 km stretch
Concern	Functional	●●○○○○
	Social	●○○○○○
	Visual	●●○○○○
	Environmental	●○○○○○
Policy	Activities	Creating buffer corridor through plantation, Ban on polythene bags, Ban on discharge of waste water into the stream, Ban on washing clothes, Ban on cattle washing, Introducing fishing
	Techniques	  Stream Restoration Techniques Soil Stabilisation Techniques
	Built	-----
	Material	-----
	Planting	  Water Retaining Species Hydrophytes - Submerged, Emerged & Floating
3) TYPOLOGY		EXISTING OPEN SPACES
Available Open Spaces		Vacant Plots Incidental Open Spaces
Ownership		Private Private
Existing Use		Parking and storage Seating areas, Disposal of

			untreated & unsegregated waste (turned into Garbage Depot)
Approximate Area		18000 sqm = 4.45 acres	1786 sqm = 0.4 acres
Concern	Functional	●○○○○○	●●○○○○
	Social	-----	-----
	Visual	●●○○○○	●●○○○○
	Environmental	●○○○○○	●○○○○○
Policy	Activities	Community Open Space, Retaining cultivable land, Provision for Village Market, Open spaces for events & festivals, Local species Floriculture, Community Supported Agriculture (CSA)	Spill over space for Crematory activities, Nursery, Seed Banks, Play area within the school premise, Segregation and Treatment of collected waste
	Techniques	-----	-----
	Built	No built structures on agricultural plot, Built space required should not be more than 3 m	Built space required should not be more than 3 m.
	Material	-----	Use of eco friendly building materials, Earth bags used for the sorting and collection area, Prohibition on concrete, Organic fertilisers – by product of waste
	Planting	Crops - okra, fenugreek, spinach, Sugarcane. Fruit trees - mango, sapota, guava, tamarind, Custard apple, jambhul. Floriculture with plants like marigold, kagda, mogra, gerbera, Hedychium	 Large Canopy Evergreen  Floriculture & Hydrophytes

		<p><i>coronarium</i>, were cultivated in the past by the settlement. Large canopy evergreen trees should be used in community spaces</p>	 <p>Flowering Fragrant Species</p>
4) TYPOLOGY		FARMLANDS	
Available Open Spaces		Farmlands	
Ownership		Private	
Existing Use		Residential	
Approximate Area		33600 sqm = 8.3 acres	
Conce rn	Functional	●●●●○	
	Social	●●●●○	
	Visual	-----	
	Environmental	●●○○○	
Policy	Activities	Agro forestry	
	Techniques		
	Built		
	Material		
	Planting		
5) TYPOLOGY		INFRASTRUCTURAL OPEN SPACES	
Available Open Spaces		Streets and Nodes	
Ownership		Gram Panchayat	
Existing Use		Junction or Cross-over spaces	
Approximate Area		5000 sqm = 1.2 acres	
Conce rn	Functional	●●●●○	
	Social	●●●●○	
	Visual	●●●○○	
	Environmental	●●○○○	
Policy	Activities	-----	
	Techniques	  <p>Stormwater Management Waste Water Treatment</p>  <p>Rain Water Harvesting</p>	
	Built	-----	
	Material	  <p>Prohibition on use of Concrete Pervious Materials</p>  <p>Eco-friendly Materials</p>	
	Planting	<p>The plantation for Bio swale : <i>Cynodon dactylon (retz) Trin</i>, <i>Saccharumarundinaceum Retz</i>, <i>Saccharum spontaneum Linn</i>, <i>Vetiveria zizanoides Stepf</i>, <i>Ludwigia parviflora Roxb</i>,</p>	

		<p><i>Oldenlindia corymbosa Linn</i>, <i>Rungia repens Nees, Karanj</i>, <i>Taman</i></p>
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V. Conclusion

In a transformed setting land use, open spaces, mature trees etc should be preserved. Commercial activities like mills, barber shop, vegetable market should merge in the village setting rather than cafes, retail outlets, boutiques, etc reflecting on the facade, signages and building heights. Waste segregation and treatment area can be transformed into a garden sufficing the need of recreation.

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Architecture-Beyond Design: Exploring Architectural Profession through Quality Management

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Abstract

Quality never happens by accident. It is a conscious effort from all project participants/stakeholders and project team members to achieve quality in their performance. Quality Management is the responsibility of the entire team, but is the initiative of the top management. Quality Management plan, its implementation, Quality assurance and Quality control are integral elements of Quality management. Documentation of quality and to achieve quality are the very pillars of Quality Management. Architect being the leader of the project should be very conscious, and demanding on the front of quality. His visualization of the project can become a reality on implementation of quality management along with other tools of Project Management.

Keywords

pillars of Quality, performance.

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