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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)

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NO	List of Book/Chapter
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1.	Planning and management of temporary emergency healthcare centers - a case study of peri urban areas of Nashik
2.	Socio-economic aspect of urbanization a case of Nashik city
3.	Effects on land use transformation of urban frontier due to fringe area quantum leap: A case area of Wardha city
4.	Kalanurup Badlat Gelele bhartiya vananche swarup:Tyatil Sanklpanache Punrjivikaran kalachi garaj
	2021-22
5.	Changing Cultural Landscapes along The Shorter And Longer Circumambulation (Pheri) Of Trimbkeshwar
6.	Kathi-Kuni construction technique and CLT (cross laminated timber) construction technique for rural settlement in case of Shimla, Himachal Pradesh
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15.	Landscape as a Method and Medium for the Ecological Urban Development: An approach to urban-regional planning and development
16.	Cultural Urban Forests: For Sustaining Urban Ecology, Environment and Conservation of Cultural Values
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CONTENTS

PLANNING AND MANAGEMENT OF TEMPORARY EMERGENCY HEALTHCARE CENTRES - A CASE STUDY OF PERIURBAN AREAS OF NASHIK.

Meghana Sunil Joshi

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Abstract : The World Health Organization (WHO) defines primary healthcare as "a whole-of-society approach to health and well-being, centred on the needs and preferences of individuals, families, and communities." "Primary healthcare, "the WHO explains, "ensures people receive comprehensive care. It is necessary to have an access to people for prompt health care in areas where economic, geographic, or cultural barriers limit access to affordable services especially during disasters. This paper attempts to address issues like accessibility, the immediacy of care, economical deploy ability and affordability, to health and well-being of individuals, and communities during disasters. The study will follow a qualitative research methodology where data will be collected from a comprehensive literature review. The comparison matrix shall be derived from the existing literature review and suitable case studies.The research will be a review of existing materials and systems of construction and study of new materials and technologies to arrive at a strategy to be used in selection of materials and systems for temporary shelters .A comprehensive strategy for selection and implementation of building materials and systems will optimize operatability and help support development of emergency shelters during mass casualties

Keywords: Temporary structures, primary health care centre, Prefabricated, portable construction, criteria for slection of temporary structures, medical facilities construction

1. Introduction :

Health care centres are central to provide emergency care and hence when a disaster strikes, the society falls back upon the health care centres to provide immediate aid in the form of emergency medical care.

At disaster sites, an immediate response is needed. Natural and manmade disasters are of immense concern throughout the globe. Primary health centres (PHCs) represent the first tier of the Indian health care system, providing a range of essential outpatient services to people living in the rural areas. Limited public health infrastructure and lack of medical and support resources contribute the vulnerability of existing facilities in developing country like ours with limited resources.

In India, a network of over 25,000 primary health centres (PHCs), the first and lowest health tier, provide essential preventive, promotive, and curative health services in the rural areas.But any serious case has to be referred to a bigger hospital in the nearing city.

However when a disaster strikes, or in any emergency situation the facilities provided by the PHC'S are insufficient to tackle the rise in number of patients. Also, the location and accessibility of PHC'S is far

off and patients have to travel long distances to avail services or in perurban areas too the hospitals could be inaccessible . There is not only an urgent need to increase the preparedness of healthcare centres in mass casualties, but also the local administration have to expand their focus on providing immediate facilities to step up the preparedness of such centres.Facilities should be developed in a central accessible city location to cater to the villages and periurban areas of the city.

Some calamities can cause major disruptions to emergency services owing to failure of roads, bridges etc. Response to such emergencies should therefore be quick, easily accessible, procurable, erectable and flexible.

Hence healthcare buildings demand flexibility and adaptability in use and which can be constructed rapidly to meet tight programmes.

Buildings have been built in one place and reassembled in another throughout history. The world's first prefabricated, pre-cast panelled apartment blocks were pioneered in Liverpool. The idea of modular buildings constructed from prefabricated materials and parts has been around for a few thousand years. Roman armies carried their forts in prefabricated sections for easy installation once they arrived at their destination, and since then modular construction has only grown. The tent structures were designed as “instant dwellings” where traditional construction techniques for shanty settlements and squat are too slow.

Erection of temporary structures has been an answer for rapid erection of facilities in times of distress. Such temporary shelters ensure the safety of affected communities and also help prevent secondary events such as the spread of diseases. This has to be done both swiftly and efficiently.

1.1Aim: To understand challenges and opportunities of healthcare centres in India and to suggest a response plan and procedure for its up gradation in disasters.

1.2 Research Question: What should be the emergency response strategy for temporary healthcare preparedness in disasters at rural level ?

1.3 Hypothesis: An organised response strategy for construction of temporary structures to support healthcare systems in emergencies will provide effective and optimal support in disaster management.

1.4 Objectives:

- To examine emergency care systems in India and to explore its scope and limitations.
- To study and analyze capacity building and preparedness measures for healthcare .
- To understand , identify risks and mitigation methods, resource management and nature of extended facilities required for setting up of temporary medical facilities.
- to establish a flowchart for setting up, support and control of healthcare facility.
- To incorporate community participation in this process.

1.5 Scope and limitation:

This study aims to provide a response plan for up gradation of rural healthcare centres among the various levels and types of hospital care .It will further look into the management of temporary structural system to support such healthcare facilities to give prompt , fast track solution in disasters.

2. Research Methodology

- A qualitative study, using questionnaires and case studies was used to investigate approaches towards provision of shelters during disasters.

- Data was collected through in-depth interviews of technical people involved in disaster management in Nashik area such as PWD and disaster management cell executives.The priorities are defined depending on the preferences of knowledgeable assessment of local experts like Architects, structural designers, contractors and government officials.

- An intensive literature review was conducted including disaster management and emergency response policy and practice and theory applied as a response to emergency healthcare in disasters.Using the results of the literature review, the criteria's were summarized and weightage was given to the priority of criteria's depending on case studies of different materials used as well as interviews and questionnaire surveys.

- Temporary shelter systems around the world and in India , in the past as well as future trends are studied.

- A study of materials that are used or can be used was done by studying brochures as well as actual applications.

- Also, an evaluation of merits and demerits of various materials and construction systems that can be used is done and evaluated with respect to the multiple criteria's to arrive at a strategy for selection of possible approach for such projects.

A study of building construction approaches in disasters like earthquakes, floods and fire was done to understand the challenges and approach for selection of material and construction system in Nashik area.

- Evaluation of local criteria's such as proximity of material supply from site, Strata of ground, climatic factors is also done and priorities are established along with global factors.

- Further specific approach in the selection of materials with respect to medical care and its criteria's are considered.

- Data analysis was done bythe AHP method by establishing priority amongst criteria’s and assigning weightages.Hierarchy was then refined based on the assessment and feedback given by a group of 15 experts in the questionnaire survey. The experts were technical people like architects, structural designer's and contractors who have studied and worked in the temporary construction techniques and medical facility buildings.

3. Data Analysis:

Priorities of criteria for consideration of materials and systems of construction for medical facilities were established from the response of experts in the field. Specific preferences for use in Nashik region considering local factors was also analyzed from the survey.

Material preference with respect to the priorities was established from the material comparison matrix. Complete bucket list of data collection was differentiated into existing systems in use and Alternative systems catering to more parameters.

Table -1: Priority Analysis table for Materials

Analysis		
1	**Puff Panels**	Most Preferred
2	**PVC Sheets**	
3	**Metal or Asbestos**	More Preferred
4	**Recycled Ply**	
5	**Aerocon**	Less Preferred
6	**Cloth**	
7	**MDF**	Not Preferred
8	**Bamboo Mat Board**	
9	**Mass Timber**	
10	**Precast**	

Table -2: Priority Analysis table for Materials

Priority depending on Percentage			
Sr. No	**Criteria**	**Total**	**%**
1	Availability	61	5.54
2	Time required for erection is less	60	5.45
3	Fire safety	57	5.18
4	Economical	55	5.00
5	Can be erected with unskilled labour	53	4.81
6	Operational safety	53	4.81
7	Design and joining details	52	4.72
8	Strength and Tolerance	52	4.72
9	Waterproofing	50	4.54

10	Light weight	50	4.54
11	Modular construction possible	49	4.45
12	Standardization	48	4.36
13	Less maintenance and serviceability	48	4.36
14	Less labour intensive	47	4.27
15	Quality of material	46	4.18
16	Environmentally more suitable	42	3.81
17	Durability	42	3.81
18	Sustainability	41	3.72
19	Mechanized systems	41	3.72
20	Dimensional accuracy	41	3.72
21	In house production	40	3.63
22	Insulation properties	35	3.18
23	Life span	34	3.09
24	Transport	4	0.36
		1101	

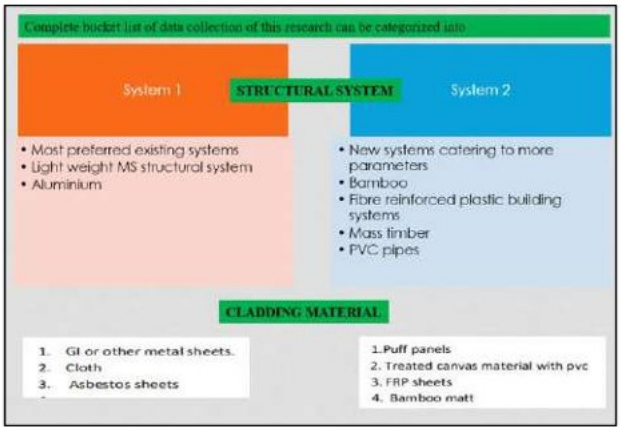

Fig: 1: Complete bucket list -1

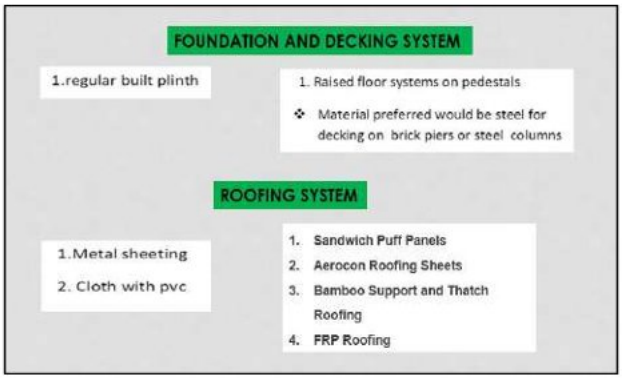

Fig- 2: Complete bucket list -2

4.Discussion

The emergency plan for smaller hospitals such as community health centre may actually only focus around providing either mobile emergency care on the site of incident or providing intermediate stabilization and forward referral of serious patients to the nearest networked hospital. Such small centres can provide immense help in case of mass casualty by providing definitive care to such victims who are not seriously injured.

4.1 Disaster Scenario in Nashik District:

Health care networking will be a necessary step in preparedness of such centres. Network essentially means a dynamic link between various health care facilities of a given geographical area for optimization of available resources.

The District of Nashik, is vulnerable to various kinds of hazards like flood, earthquake, fire hazard, drought, road & railway accidents, chemical hazard, communal violence, epidemic, hailstorm, heat wave & cold wave, stampede etc. The devastation caused by various kinds of natural and manmade hazards has posed a challenge before the Nashik district administration and other responsible bodies like NGO's to analyse each and every decision making process to gear up the rescue and restoration during such situations as well as building up the capacity to face calamities in future.

4.2 Response mechanism to disaster in India :

Disaster response mechanisms in India typically makes use of existing built facilities of bigger scale, like schools and mangal karyalaya for use as temporary shelters owing to the basic amenities of toilets, electricity and water etc already available.But this can be done only if such buildings have remained unaffected by the disasters themselves and are in close proximity to the area affected with respect to accessibility by the affected people as well as facility givers. Also the availability of such ready facilities in the vicinity may not be there.

4.3 Proposed alternative response:

Temporary facilities can be erected on open lands close to the primary health care centres of the area, or on land close to the disaster-prone region and easily accessible. Also being temporary and reusable nature, the same unit can be used in multiple closely spaced regions on various occasions. Vacant land can be used for other purposes when not in use for such centres.

In this sense, the selection and location of collective temporary shelters is a decisive factor in the response to disasters. While the response has to be timely, it should not be hasty. There are multiple issues that arise with hasty erection of temporary shelters such as incomplete beneficiary selection, poor site selection, contextually inappropriate choice of shelter designs, materials and construction

technology, inflated costs, lack of community consultation or participation leading to inappropriate shelter and dissatisfied families.
Rapid needs assessment should be undertaken before deciding on type of shelter solution to evaluate their usability and contextual relevance over other forms of shelter support.
The temporary shelters should be constructed with a plan which guides the dismantling of temporary shelters while promoting maximum salvage and reuse of the materials.
This study therefore evaluates for temporary facilities to add to primary healthcare centres, and the deficiency of systematic approaches that support decision-makers in the selection analysis of temporary constructions for healthcare facilities.
Adoption of pre-fabricated shelters requires careful and detailed needs assessment so as to consider issues like suitability of standardized design , climatic performance, durability of materials, ability of local community to repair and maintain, need of external aids such as cranes, disposal of degraded shelter material in environmentally safe manner.
With respect to healthcare facilities additional criteria's of selection will be included such as

- Toxicity
- fungal and bacterial attack and decay
- Antimicrobial
- Sterile
- VOC's from materials
- recycling or biobased
- reusing
- Flexibility to accommodate health infrastructure such as gas piping and air conditioning.
- Material selection should be prioritized on the above criteria's for optimum use for the purpose for which they are essentially selected.

5.Findings

The initial results of this study comprehend the definition of the primary evaluation elements used to compose the criteria.The choice and availability of construction materials is one of the key factors that determine the design of the temporary shelters.

As a response to increasing health facility in mass casualty, practical approach will be to erect temporary facilities whenever required and after the purpose is served, material should be dismantled, packed and transported to base where it can be maintained till further use.

Establishment of a local database or a protocol for erection of temporary structures for mass casualties will give a permanent guideline for approach at the time of casualty.At the strategic level, the model allows the collection of a diverse range of facilities to function as temporary structures and the prioritization of best alternatives in the case of a disaster.

Modular systems of construction using light weight structural systems and variety of roofing and cladding systems depending on priority of criteria's is best suited for temporary construction.

The best materials to be used for temporary construction from the point of view of reuse & recycling will be manmade materials that can be reused such as steel sections and galvanized iron or FRP sheets or other recycled materials boards. Natural materials like bamboo can be an alternative subject to availability

Light weight steel or aluminium is the most preferred material for use as structural system for temporary sheds in Nashik region. Bamboo or PVC pipes is the second best alternative

Useof prefabricated systems with predefined cladding roofing and flooring options will improve levels of quality , reduce material wastage and construction period.

Basic foundation system using ready steel members or brick piers and floating floor construction system with steel beams and flooring is recommended instead of conventional plinths

Identify and ensure resources of labour and transport along with the criterias discussed for speedy construction of systems.

Trainings could be given to dedicated staff by officials for erection of selected systems in an area.

6. Strategy.

- To identify and categorize hazards in the region where temporary shelters are proposed.
- risk assessment of the hazards
- Assess climatic condition and geography of the area
- Check on material and labour availability
- Evaluate the material on priority based on weightages.
- Evaluate application of structural system based on recommendations in the study and hazard category.
- Evaluate non-conventional materials available in the region and systems if any based on priority and material comparison matrix.
- Identify resources such as equipment, labour and transport for the materials selected.
- Identify location and resources for storage and maintenance of material when dismantled and stored for further use.

7. Conclusion

This study helps address one phase of the disaster management cycle . It attempts to organize the selection and construction of healthcare facility which is a preliminary step considering challenges facing the built environment from disaster perspective. It proposes a guideline and systematic approach to support the decision process of selecting temporary shelters. New materials and systems can be evaluated based on the multicritertia model and considered for use.

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SOCIO-ECONOMIC ASPECT OF URBANIZATION A CASE OF NASHIK CITY

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Abstract : With a population of roughly 2.18 million in 2022, Nashik is the fourth largest city of Maharashtra. The city is a potential investment city because of its favourable climatic conditions, strong industrial presence, renowned educational institutions, and social and cultural environment. Based on these characteristics, the real estate market in the 25-kilometer radius surrounding Nashik City is booming. The District's GDP has doubled in the last ten years. This has influenced people's purchasing power, and the real-world rise in the vehicle market, real estate, and retail is evidence of this. This research focuses on the farmers of Peri-urban areas and the impact of real estate development on their lives. An attempt has been made in the present study to understand the socio-economic changes in the lives of fringe area landowners. The methodology followed was a questionnaire survey, and interviews of the farmers of Chandshi, Jalalpur, and Mahadeopur which are on the fringes of Gangapur road which is the prime area of real estate. The main aspects studied were to understand the diversification of the income generated through the conversion of their farmland, and willingness to relocate to farther farmlands. It was noted that even though on government records we see agricultural land, the landowners are agriculturists and not native farmers of that village. The farmers view this opportunity of urbanization as a way to change their day-to-day hardships due to a lack of funds. We find a positive and negative impact of the eviction or displacement of the peri-urban farmers in terms of the livelihood that they earn through farming. The chosen few farmers with educated backgrounds were able to diversify their income and benefit from urbanization. Whereas the other population could secure jobs either through their education or proximity of the urban neighbourhood.

Keywords: Socio-Economic Development, Urbanization, Peri-urban land owners.

1. Introduction :

Maharashtra's northern region encompasses the city of Nashik. It is around 190 kilometers north of Mumbai, the state capital. Nashik ranks fourth largest in Maharashtra after, Mumbai, Pune, and Nagpur. Located on the banks of the Godavari River which flows from Trimbakeshwar to vijaywada. Nashik serves as the district's administrative headquarters as well.

Nashik is regarded as "the third most industrialized city in Maharashtra after Mumbai and Pune," mostly because of recent significant industrial growth. National Treasury Printing Press and a significant thermal power plant (Eklahare) are located here. The region around Nashik and its environs is divided into five "Industrial Zones" (Satpur, Ambad, Sinnar, Igatpuri, and Dindori).

There are several sugar mills in the district. White onions and pomegranates of the region are two other top exports from the country. Although Nashik has industrialized, the district's primary industry remains agriculture. Approximately 90% of Indian wine comes from the Nashik Valley. Given that, more than half of India's vineyards and wineries are located here, the city is also known as the "Wine Capital of India" or "India's Napa Valley." Locally renowned wine labels like "Sula" have won recognition on a global scale.

1.1 Population Growth

The population of the city has increased dramatically over the past two decades, going from 1.49 million as of the 2011 Census to nearly 2.18 million in 2022. By 2035, Nashik's population is projected to increase to 3.2 million.[1]

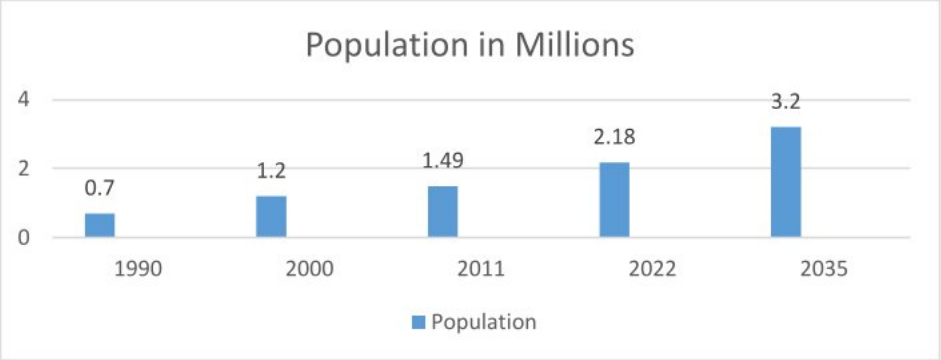

Fig 1 Population Growth of Nashik City (World Census)

1.2 Nashik District Tehsil

Fig 2 Tehsil under Nashik District (Source- Maps of India)

1.3 Nashik City Development

The city has been divided into three sections by the passing of the highways (NH3, NH50). The main development initially took place alongside these highways. The Godavari River's course also split the city in two. Due to its railway and highway connectivity, the city growth was most noticeable along the southern bank of the Godavari River. On the opposite bank of the river, there was agricultural area that was used to grow a variety of crops, including wheat, jawar, bajra, rice, as well as fruits like grapes and vegetables like tomatoes and onions.

Total villages that come under Nashik District - 1960

Small Farm Landowners of the District - 3, 50,956 (54%)

2. Aim

The primary goal of this research study is to concentrate on the farmland owners in the peri-urban areas of Nashik City, their growth, and the opportunities they have with urbanization and the relocation or eviction from their ancestral farms, which is based on the sector analysis.

2.1 Objective

- To study, how urban growth has affected Peri-Urban farmers.
- To examine changes in the economic standing of Peri-Urban farm owners.

2.2 Methodology

The primary and secondary data used in this descriptive and quantitative study were gathered from a number of sources. In the current study, an effort has been made to conduct a systematic analysis of changes in the economic standing of landowners in peripheral areas. This analysis can help in understanding how shifting from rural to urban land use affects the peri-urban interface's economic characteristics. For this research study, a research sample was chosen (based on the proximity to the area under the jurisdiction of Nashik Municipal Corporation) for data collection and analysis. The chosen sample had an initial social setup of a more number of uneducated population.

2.3 Limitation

This study is limited to the developments and landowners of Chandshi, Jalalpur, and Mahadeopur. The reason for selecting these 3 villages is the dwellers of these villages were uneducated for generations and considered to be underdeveloped for ages. Now with the proximity to the Urban city, they were exposed to urbanization and Urban life.

3. Current Real Estate Development

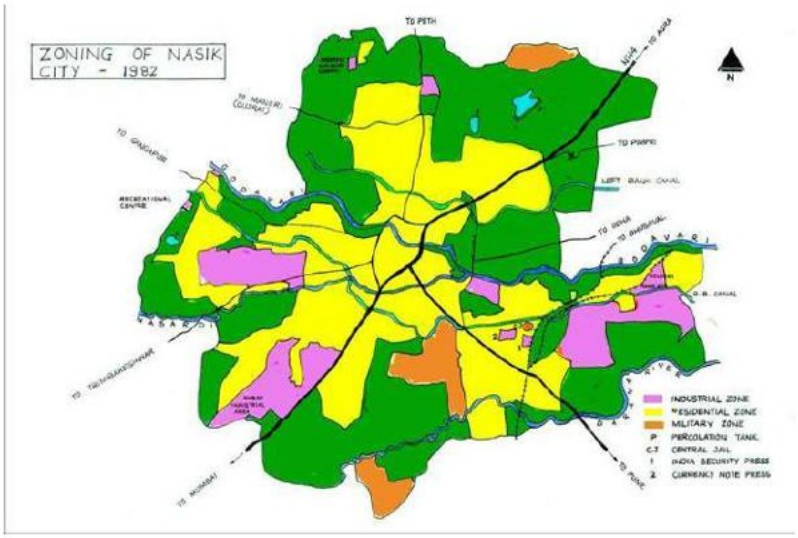

Figure 3: Geographic Map of Nashik (Source- Maps of India)

Nashik is a promising investment location due to its favourable climatic conditions, strong industrial expansion, educational institutions, and social and cultural environment. Based on these characteristics, the real estate market in Nashik City, which has a perimeter of around 25 km, is booming in all directions.

The city's College Road and Gangapur Road neighbourhoods, which have the largest commercial centers, banks, educational institutions, and entertainment facilities, are the most popular and have the highest saleable prices.

In the past, compared to other areas of the city, the Panchavati neighbourhood had not experienced considerable growth in the property sector due to the lack of industries there. New townships are being built on both sides of the 100-foot ring road, which connects Panchavati to the city's busy Gangapur Road in only a few minutes.

3.1 Drivers of the Economy

In recent years, the demand for both residential and commercial space is rising. Established builders, developers like Raheja Group, DLF, DSK Group, Nirman Group, and Bagad Properties are developing projects of apartments, villas, and commercial complexes in the city. This affects the growth of suburbs on the outskirts of the central city.

The announcement of Metro project has made access to markets, employment and, administrative possibilities, medical, and educational services easy. The amount of time spent commuting would be reduced, which would boost population productivity overall.

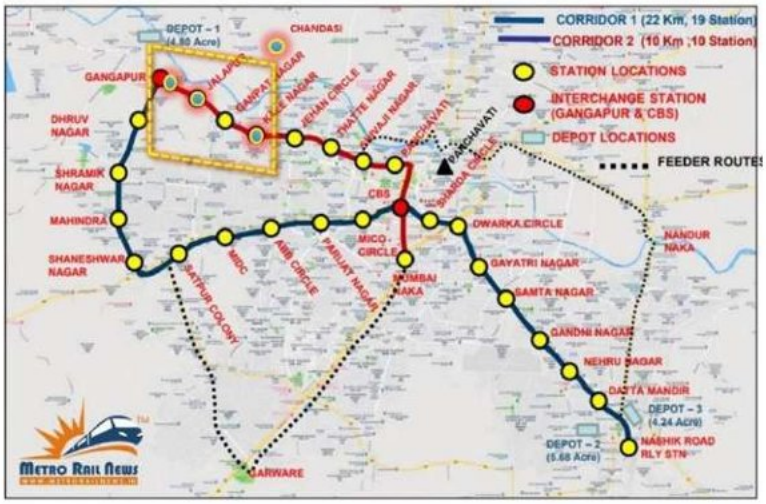

Fig 4 Metro Route of Nashik (Source-Nashik Metro Project)

3.2 Government Policy

With the new Town planning model, and the Regional plan the developers grasped the peri-urban areas' potential for the growth of the city and purchased sizable agricultural land parcels near the developed land, for instance, in the riverside villages of Chandshi, Jalalpur.

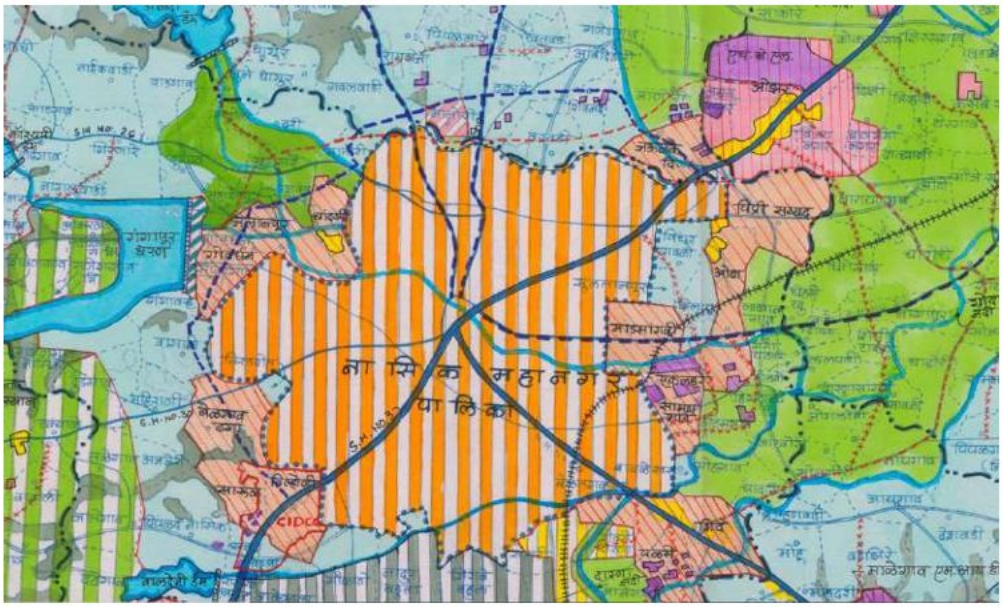

Fig 5 Regional Plan of Nashik District (Source- Regional Plan Nashik)

4 Data of Chandshi, Jalalpur, And Mahadeopur

Table 1 Demographic data

Village	Geographic area in Hec	Net Area in Hec	Total Population	Male	Female	No. of land-owners	Agricultural area	Non-Agricultural
Chandshi	491.15	429.78	2047	1053	994	1317	292.905	136.875 (31.8%)
Jalalpur	1069.09	857.83	2940	1540	1400	1777	857.3	0.53866 (0.06%)
Mahadeopur	334.65	274.02	1708	908	800	321	273.74	0.28 (0.10%)

4.1 Connectivity to Gangapur RoadC

Legends- 1. Anandwalli, 2. Gangapur village, 3. Jalapur, 4. Chandasi village, 5. Mahadeopur

Fig 6 Connectivity from Anandwalli Gangapur Road (Source Nashik City Map)

4.2 Chandshi

Chandshi farmers cultivate wheat as kharip crop along with tomatoes, green leafy vegetables, coriander. Alongside these there are rose, guava, and grape farms.

The Regional Plan proposed the Chandshi village in Yellow zone. Due to its connectivity to Gangapur road (which is just 2.7 kilometres) on one side and Mhasrul-Makhamalabad road on the other side, farmland was converted to non-agricultural land at a faster rate than Jalalpur or Mahadeopur. This further initiated the developers and agriculturists (People whose previous generations were farmers) to start buying land in this village. Though data does not show a change in land uses the native farmers of the village are replaced by agriculturists. The outsiders in the village are approximately 80-85%.

The developers started building apartments or developing layouts of bungalow plots and selling at a lesser rate than the city. The urban dweller who could not buy a dwelling unit in the urban area opted to buy bigger units here. Due to the SmartCity project, the development happens in these areas under the guidelines of NMRDA. The MSRTC connectivity and seater rickshaw made it possible for the children of the village to approach the schools, colleges in the city easy. The younger generation was lured to work in malls, and started considering working in farm below dignity. The girls of the village could get easy access to education which changed the psychology of the family. The developed residential layouts provided opportunities for the villagers of Jalalpur, Mahadeopur to work as drivers, house help, gardener, etc.

The rates of farmland in Chandsi are high as compared to Jalapur and Mahadeopur. As per RR, 1.5 times to Jalalpur.

4.3 Jalalpur

Compared to Chandshi Jalalpur is 4.2 kilometres from Gangapur road. Major crops of this village are Wheat, soybean, cabbage, cauliflower, green leafy vegetables, and capsicum. Many of the farmers have irrigation systems installed; few have wells in their farms. Farmers with accessibility to river water lift the water or farms adjacent to the canal have benefits of farming throughout the year.

Jalalpur also comes under yellow zone in the Regional Plan. As per the data received at present one third of the farmers are agriculturists. The percentage of outsiders is approximately 30-35%.The conversion of non-agriculture land use is limited or negligible 0.06%.

The connectivity by MSRTC bus and seat rickshaws made it easy for the younger generation to get jobs in the urban areas like house help maids, drivers, etc. Most of the land is under contract with the developers or bought by the agriculturist. As per RR, 10% more than Mahadeopur.

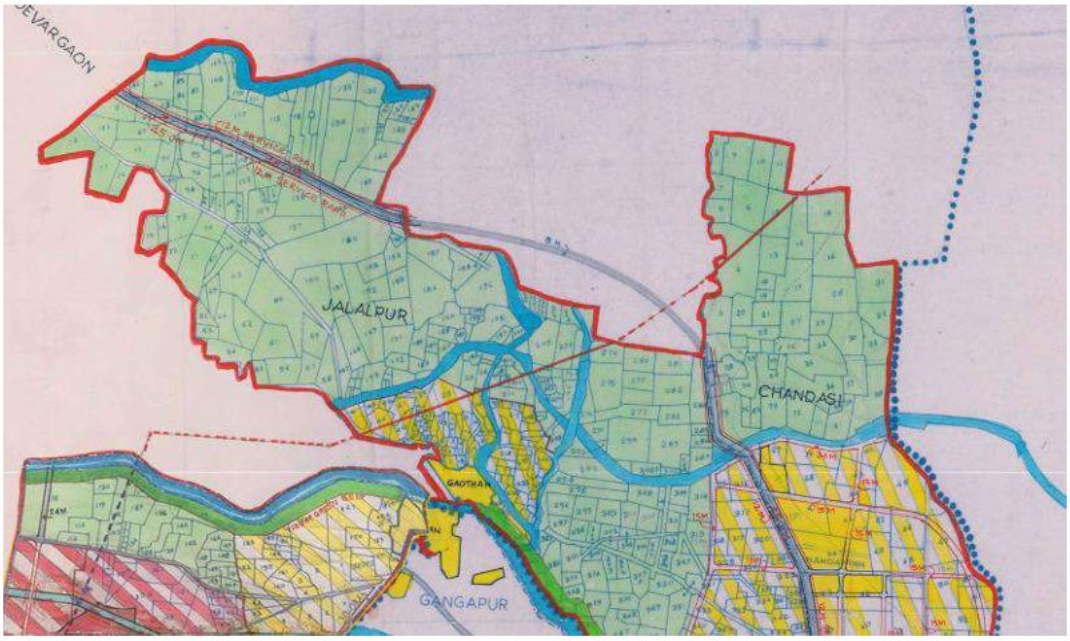

Fig 7 Regional Plan showing Chandshi, Jalalpur, Mahadeopur (Source Regional Plan Nashik)

4.4 Mahadeopur

Compared to Chandshi, and Jalalpur Mahadeopur is farther from Gangapur road (9.6 kilometres) and that is the reason that urbanization has not affected this area at present. The main crops taken in this area are vegetables like tomatoes, bottle gourd, ridge gourd, sponge gourd, green leafy vegetables, coriander, and Capsicum. There are a few grape vineyards in this village.

The Regional plan does not show Mahadeopur under yellow zone yet. This is the reason the farms in the radius of 500m from the urban boundary only could be benefitted. The outsiders are approximately 10-15%. Though the developers have done initial investments with farmland owners, the farmers of this village continue to do their farming activity.

5. Observations

The farmers owning up to 2-acre land on their names used to earn with kharip crop of wheat and other crops like tomatoes and vegetables around 1.5 lakh per acre annually. However, with the uncertainty of rainfall and other weather conditions and hardships involved, it is not the same every year. A few examples of demographic and socioeconomic factors are age, education, farmland, family size, and access to infrastructure. These were the primary determinants of these farmers' future

The farmers in Chandshi and Jalalpur recognized the potential of their farmland in light of urbanization trends. Either on their own or in partnership with other developers, they began converting their

farmlands to create layouts. Following this development, the farmers' financial situation changed due to the good prices they obtained.

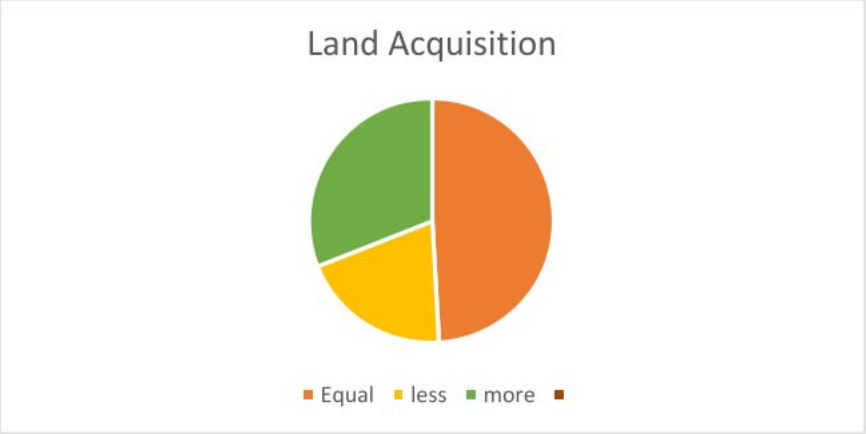

Fig 8 Farmers acquisition of New land (Source- This study)

It was observed that when the farm was divided into more siblings each got a smaller piece of their ancestral land. Thus there was seen a trend to convert the land at these prime locations and move away to the periphery of the district where they could claim a bigger piece of land on their name. Most of the farmers in these areas who have converted their property have purchased larger farmlands 35 to 50 Kilometres away from these villages. Along with investing in bigger farms, they also invested in cars, and home improvements. One of the respondents informed that they had a native land of 8-acre and four siblings after converting the land they could purchase approximately 50 acres of land in Rasegao village on Vani road. This is evidence of the positive impact of urbanization.

More than half of the farmland owners were able to acquire the same amount of land about 21% less since they had more title owners (number of siblings), but they were still able to improve their homes and buy themselves cars. The educated farmers were able to diversify and supplement their income by operating small businesses like transportation, fabrication, dairy, and venturing into construction to earn rent.

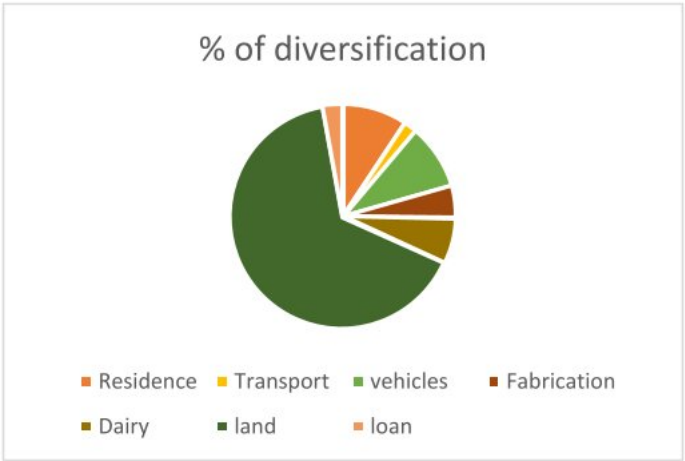

Fig 9 Percentage Diversification of Income (Source- This study)

The less fortunate ones had to repay the loans secured for bore wells' marriages, education, hospitalization etc. and had to move further away for survival. They have bitter sweet feelings about urbanization. The small and less educated farmers are the ones who always face issues to earn a humble living. It is observed that against an expense of Rs.1,00,000/- for an acre for the crop of tomato the farmer might earn up to Rs.3,00,000/- in a year and another year he might not even get Rs.50,000/-. These kind of uncertainties compels the farmer to consider selling his land for a price that he might earn in his full lifetime.

The Adivasi farmers rely mostly on rainfall for their crops and then rest of the year they work on other farmers lands to earn a living. After selling their farmland, they have earned employment on construction sites. This has given them a surety of income.

6. Conclusion

The economic characteristics of the peri-urban interface are impacted by changes in land use from rural to urban activity. An open countryside with peri-urban areas primarily populated by agricultural villages defines the urban perimeter, from which urban settlement spreads. Urban growth typically occurs by intruding on productive agricultural land. The farmers in this peri-urban area are consequently evicted.

The majority of rural residents rely on agriculture for their living. The community in peri-urban areas adopts a variety of livelihood choices to meet their needs depending on how rural and urban the place is. The small and Adivasi farmers work on other farms or as labour on construction site to complete their daily needs. According to the impact assessment estimation, peri-urban farmers' socioeconomic condition is significantly impacted by urban growth. It was observed that due to urbanization, the psychology of the farmers of particularly these 3 villages has changed considerably. The literacy rate has increased which has changed the habits of the rural dweller.

It has been noted that prime agricultural property is purchased for the development of residential communities, commercial structures, and educational facilities. Opportunity, affordability, and location of the farmland all play a significant role in the decision to sell the farms for conversion to urban use or amenity. This puts pressure on the peri-urban farmer to move to another location where they may continue to rely on farming for their living. Some farmers could grow economically by moving away from these villages and further away from the city. Many smaller farmers with less than or up to 2 acre of land have moved to Rasegaon, Umrale and Pimpalnere. Farmers' economic decisions are influenced by their social environment in addition to market conditions. They frequently view these chances as ways to improve their financial situation and leave farming behind (the younger generation). Currently almost all farmers younger generation is educated few with higher education. The educated younger generation does not intend to work in the farm by themselves and needs labour, which are now difficult to find. Many of them do not wish to live in a rural background and wish to be part of an urban community.

The study's main motivation was to comprehend how the farmers in these regions think and how they view numerous advantages and disadvantages of urbanization. Farmers, do not benefit from the urban setup in place of their lands, because majority of them are relocated from their traditional homeland to far periphery areas. The decision to leave their ancestral property behind and move to a new farm is difficult for the farmers. When they leave, a different sociological setup of households will occupy that space. Due to their rural upbringing, farmers are aware that it would be challenging for them to lead a lifestyle comparable to urban dwellers.

We could conclude that urbanization has a positive as well as negative and considerable impact on the peri-urban farmers' economic well-being and social psychology. Due to urbanization, a lesser number

of farmers continue to do farming. The younger generation has got jobs in all other sectors. At the same time, we could also conclude that the farmers who did not have land but had the money against it could survive the pandemic in a better way. Planners need to deliberate on the displacement of farmers and farmland by considering setting up new satellite towns instead of expanding the boundary of the city into the green zone.

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I take this opportunity to thank Ar. Sulakshana Mahajan madam for all the valueable time spent to discuss with me and give direction to this research work. I would also like to thank the Talathi Mr. Sanjay Kapadnis for sparing valuable time and sharing all the official data with me. Further this reaesrch would not have been possible without the help of Mr. Jagdish Gulave resident of Chandshi village and my friend Ar. Ashish Patil who is an agriculturist and investor in these villages.

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Maps Source

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Regional Plan of Nashik

Development plan of Nashik

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CONTENTS

Effects on land use transformation of urban frontier due to fringe area quantum leap- A case of Wardha city

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Abstract:

The conversion of Earth's land surface to urban uses is one of the most irreversible human impacts on the global biosphere (Seto KC), 2011. With rapid urbanization and industrialization across the globe, urban and rural planning-related problems are increasing especially in the Rural-urban interface. The urban age is not just beginning in cities; suburban villages are also being impacted by this worldwide phenomena. As a result of this trend, peri-urban areas have grown. These regions are dealing with significant issues and dynamics for planning and implementing land use transition that was formerly dominated by agriculture.

Further research on the rural-urban interface is crucial since peri-urban areas in major cities are expanding quickly. A sustainable Municipal city also depends on the planned growth of its fringe areas. Thus, it is important to encourage the planned and sustainable urbanization of peri-urban areas. The population under migration is located on cheap land. Densification of the peri-urban area may help the central city's congestion. Additionally, it might be a solution for urban slums. For appropriate and efficient land use we need to study peri urban areas, the small settlements at the rural urban fringe usually are shifted when the development starts (Ar. Manita Saxena).

As a result, this study focuses on examining how land use transformation is affected by spatial changes in a dynamic rural-urban interface. This paper aims to understand the existing land use pattern, composition, and land cover categories in peri-urban areas. This research intends to recognize the main trends and drivers influencing urban borders and rural change and to comprehend the main issues that arise in the rural-urban interface and to identify solutions using sustainable planning principles (A. R.-G.-S.-C.-G.-O.-C. R. Rojas-Caldelas).

The study took advantage of satellite imagery to generate a LULC 3 map for the Peri-Urban area of Wardha city at decadal intervals. Polygons were traced where LULC change has happened by superimposing Landsat pictures on top of each other. The mapped data was evaluated using picture interpretation on-screen. This spatial data analysis was carried out with the help of the ArcGIS tool.

Keywords: Urban Frontiers, Rural Transformation, Peri-Urban, Spatial Analysis, LULC

1. Introduction:

1.1. Background

Urban and rural planning-related issues are getting worse, particularly in the rural-urban interface, as a result of the world's fast industrialization and urbanization. The study "Urban Frontiers and Rural Transformation" focuses on examining how social and physical changes in dynamic rural regions are causing this move from a rural to an urban system. This study also focuses on analysing how spatial changes in a dynamic rural-urban interface affect land use transition. Understanding land use change trends and taking the required steps to lessen its detrimental effects on the city and its surrounding area will be made possible by decades of LULC research. The research paper will also discuss the subject's key concepts, theories, and ideas.

1.2. Urban frontiers and rural transformation

"Urban frontier" refers to spaces in or around a city in which resettlement and new forms of economic development are emerging, often as a result of incoming capital investment associated with an often racialized political struggle between long- standing and newly settled residents (BURT).

"Rural transformation" is a process of change in rural regions that is dependent on a variety of variables and processes. In general, it has been described as modernization, rural development, changes in economic structure, and the movement of people from the farming sector to non-farming sectors of the economy.

Transformation from rural to urban system: The urban age is not just beginning in cities; suburban villages are also being impacted by this worldwide phenomena. In nations around the world, the connection between urban and rural areas is shifting. Other components of the process are particular to certain nations or locations, while other of the problems, like shifting agricultural systems, are universal. As a result of this trend, periurban areas have grown. For the planning and implementation of land use reform, these areas are dealing with significant issues and dynamism.

1.2.1. Effect of social and spatial transformations

As new types of urban, suburban, and exurban development affect community development patterns, migration and settlement patterns are shifting. Conflicts over land use and lifestyle caused by much of this development take place in peri-urban areas that were formerly predominately agricultural. Many policies like AMRUT and SPMRM continue to focus exclusively on rural or urban areas and fail to address the connections between the two. Secondary schools, post offices, telephones, credit, services for agricultural expansion, farm equipment, hospitals, and government services are all dependent on urban regions for rural areas. Both rural and urban populations benefit from strong connections in terms of living circumstances and work prospects. The success of the interaction between urban and rural areas rests on domestic trade, adequate infrastructure, and infrastructure that is both cost-effective and effective.

1.3. Need of the Study

Inadequate infrastructure, a low degree of economic activity, and poor land use planning are some of the fundamental issues caused by peri-urban growth. People frequently have issues with moving, buying land, encroachment, substandard living in slums, psychological breakdowns, problems with the law and order, the lack of a political structure, and social and environmental issues. All the factors leads to the creation of a ‘degenerated periphery". Many policies continue to focus exclusively on rural or urban areas and fail to address the connections between the two.

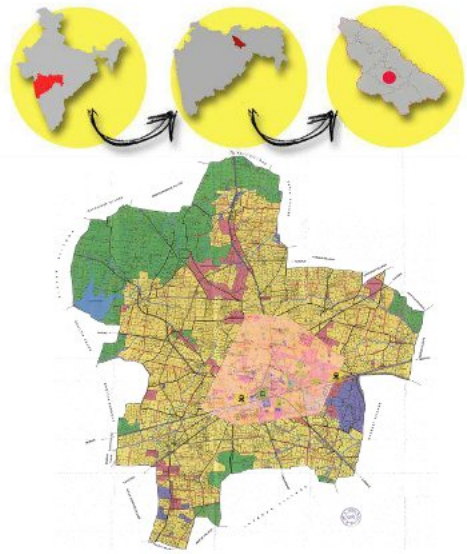
In order to promote inclusive, mutually beneficial, and sustainable urbanisation, rural stakeholders must be involved. Only when cities are surrounded by prosperous rural areas, particularly those with a resilient, fruitful, and lucrative agricultural industry, can cities be sustained. Thus, it is important to encourage the planned and sustainable urbanization of peri-urban areas.

2. Study Area and Data Collection

2.1. Selection of Study Area

The study area is Wardha City located between 20°44′30″N and 78°36′20″E, with a total area of approximately 75 km2 (7500 Ha) and an altitude of 234 m in Maharashtra State. Wardha is a municipal council in the Central Indian state of Maharashtra, which gets its name from the River Wardha. As per provisional reports of Census India, the population of Wardha Muncipal Concil (WMC) and 7 more Census towns around the city area in 2011 is 2,12,602; of which WMC population is 106,444. Wardha's average temperature is about 28°C, however it can range from about 21°C in the winter (December) to about 37°C in the summer (May). May has the highest average temperature of the year, ranging from 30.4°C to 44.4°C. December is the coldest month of the year, with ranges from 11.9°C to 27.8°C.

Table 1 Census towns around wardha city and their population



Sr. No	*Wardha City and its Peri- Urban Areas*	Population
1	Wardha Municipal Council	106444
2	Pipri Census Town	23661
3	Sindi Turf Hindnagar Census Town	20956
4	Borgaon Census Town	19759
5	Sawangi Census Town	14394
6	Nalwadi Census Town	12119
7	Masala Census Town	8883
8	Warud Census Town	6386
	Total Population	**212602**

Figure 1:The geographical location of the study area

2.2. Data Collection

In this study, the influence of peri-urban areas' changing land use and cover over a ten-year period is discussed. The USGS Earth Explorer website allows users to download Landsat satellite photos. Zone 44N for Landsat 8 OLI-TRIS for WGS 84 Date: 01.02.2011 is gathered. Image has sensors called Operational Land Imager (OLI) and Thermal Infrared Sensor (TIRS). Landsat 5 MSS for WGS 84, Zone 44N, Date: 03-Feb-2022 is collected. Image has sensors called Multispectral Scanner System. Here, the spatial resolution of the Landsat 8 satellite is 30 m, so each band pixel is multiplied by 30 m X 30 m to get area covered, while the spatial resolution of the Landsat 5 satellite is 60 m, so each band pixel is multiplied by 60 m X 60 m to get area covered. The location, shape, and properties of geographic features are stored in shape files, a vector data storage format developed by Esri.

Table 2:List of the Landsat data used

Seasons	Year	Satellite	Date of acquisition
Winter	2022	Landsat- 8	2022/02/01
Winter	2011	Landsat- 5	2011/02/03

3. Methodology :

Each image was downloaded as a WRS tile and includes information in 7 distinct bands. A layer stack of these 7 band pictures is required to construct a land use map, and once that layer stack has been completed, an administrative boundary for the city of Wardha was added. Land use maps are classified using 'Interactive Supervised Image Classification' techniques. Present study focuses mainly on four land use class i.e. Barren Land, Urban Area, Water body and Vegetation.

Table 3: LULC Classes

Sr. No.	Land Cover Class	Description
1.	Barren Land	Fallow Land Arid or poorly vegetated regions that most frequently feature bare ground or soil
2.	Urban Area	Includes all construction in the commercial, residential, Public and industrial sectors.
3.	Water Body	All bodies of water, including marine habitats as well as freshwater lakes, rivers, and streams.
4.	Vegetation	Agricultural grasslands, recreational greens and all sorts of forest vegetation, including dense forest and open forest.

Detail methodology followed to generate LULC for 2011 & 2022 is as follow:

Step1- Download landsat data from USGS website of the study area in terms of 7 bands and import those band in GIS platform. Use Composite tool from Data Management tool set to create a composite file of all the 7 bands combined. Natural Colour – 432.

Step2- Open Image Classification toolbar from customize ribbon to perform image classification on composite file. Open Training sample manager, and use draw polygon tool to select pixel values on the map of different areas for 4 aspects i.e. for Barren Land, Urban Area, Water Body & Vegetation.

Step3- Select 10 or more samples of each pixel value from the map with the help of different false colour composition. Then merge the sample points by using Merge training samples and create samples for each aspect.

Step4- After creating all samples use Interactive Supervised Classification Tool from Image Classification toolbar to generate LULC. Select a study area by creating a polygon shape file & extract the study area from the LULC layer, by using Extract by mask tool or clip tool. Now convert the raster result into polygon using conversion tools and calculate the areas for each class defined.

Detail methodology followed to generate change in area of each aspect.

Step1- After getting LULC map for both years 2011 and 2022 using supervise classification method raster files converted into vector files by using raster to polygon tool. Projected cordinates need to set from UTM zone for area calculation. (Wardha- 44N northern hemisphere, WGS 1984)

Step2- All the polygons from shape files categories into 4 classes using dissolve of geoprocessing tool for both shape files. Calculate areas of both shape files in new field by calculate geometry.

Step3- Create changes between years using intersect of geoprocessing tool to get 16 attributes. Now add 2 new field i.e. change and area change, for change use field (calculator change = {(class 2011) + "-" + (class 2022)},) by using this we will get 16 classification like vegetation - barren land, vegetation - urban area, etc. Then use Geometry calculator to get respective areas for each fields.

The methodological algorithm will show the LULC images as well as the percentage of the region that each of the different specified classes covers. The algorithm is applied to the colour class cluster in order to extract the feature. The resulting LULC images produced using the aforementioned process are then used for analysis.

4. Analysis :

Land use land cover map of Wardha city for 2011 and 2022 were prepared (Fig. 2) and results showed that in 2011, the area covered under Urban Area was about 7% (456 Ha); 73% (4972 Ha) Barren Land; 20% (1406 Ha) Vegetation and only 0% (17 Ha) covers under Water Bodies. Similarly, in 2022, area covered under Urban Area was about 24% (1602 Ha); 62% (4255 Ha) Barren Land; 14% (973 Ha) Vegetation and only 0% (20 Ha) covers under Water Bodies.

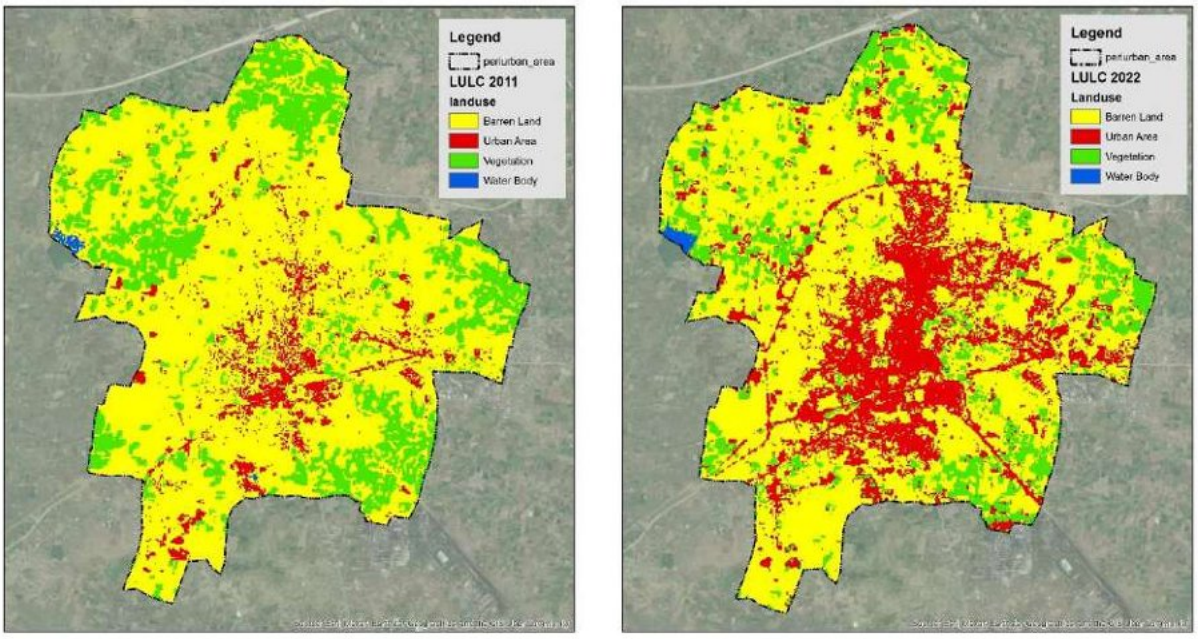


Figure 2: Land Use Land Cover Map of Wardha City 2011 & 2022

Table 4:Statistics of Landsat classification area for 2011 and 2022

Sr. No.	Land use	2011 Area in %	2011 Area in Ha.	2022 Area in %	2022 Area in Ha.	Difference In %	Difference In Area
1	Urban Area	7	456	24	1602	17	1146
2	Water body	0	17	0	20	0	3
3	Vegetation	20	1406	14	973	-6	-433
4	Barren Land	73	4972	62	4255	-11	-717

As a result, it was noted that the area covered by vegetation decreased by 6% over the ten-year period 2011–2022. Due to rapid urbanisation, particularly on the outskirts of the city, forest land has diminished as a result of deforestation and must be turned into built-up territory. As a result, the area classified as an urban area in 2022 has grown by 17% from 2011. However, it was discovered that the region that was barren in 2011 had shrunk by 11% and appeared to be replaced by a built-up area, as shown in Figure 3.

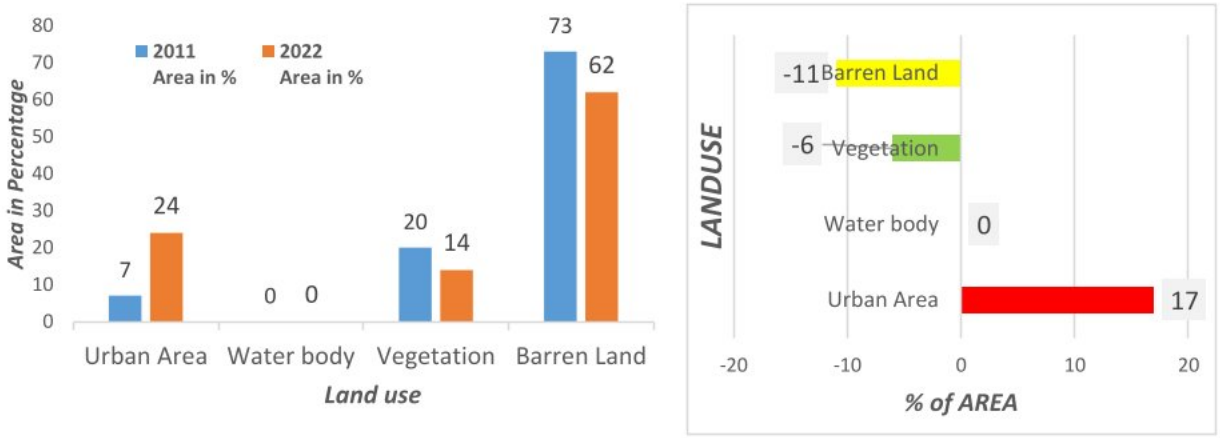


Figure 3: Percentage of different land-use/land-cover classes from 2011 to 2022

Land use land cover map of two decades was dissolved and intersect to get the change in landuse from one class to another. Final change in areas of each attribute is given in Table 4.

The processes of land-use transformation is possible in number of ways, like, Land acquisition for industrial, commercial, real-estate and infrastructure development, land acquisition for the creation of special economic zones 5 (SEZs) and selling of agriculture land by farmers for the construction of houses by individual owners. Since agriculture is less valued than other industries, some farmers "give up" land without protest as land prices increase as infrastructure and development projects are announced.

Table 5: Change in Land Use from one class to another

Sr. No.	Change (2011-2022)	Change Area in Ha.
1	Barren Land-Barren Land	3441.83
2	Barren Land-Urban Area	1164.31
3	Barren Land-Vegetation	354.08
4	Barren Land-Water body	5.68
5	Urban Area-Barren Land	116.26
6	Urban Area-Urban Area	327.23
7	Urban Area-Vegetation	12.17
8	Urban Area-Water body	0.33
9	Vegetation-Barren Land	691.15
10	Vegetation-Urban Area	108.36
11	Vegetation-Vegetation	603.59
12	Vegetation-Water body	0.18
13	Water body-Barren Land	0.21
14	Water body-Urban Area	1.05
15	Water body-Vegetation	1.72
16	Water body-Water body	13.82

Figure 3 Chart showing change in Land use of all 16 classes

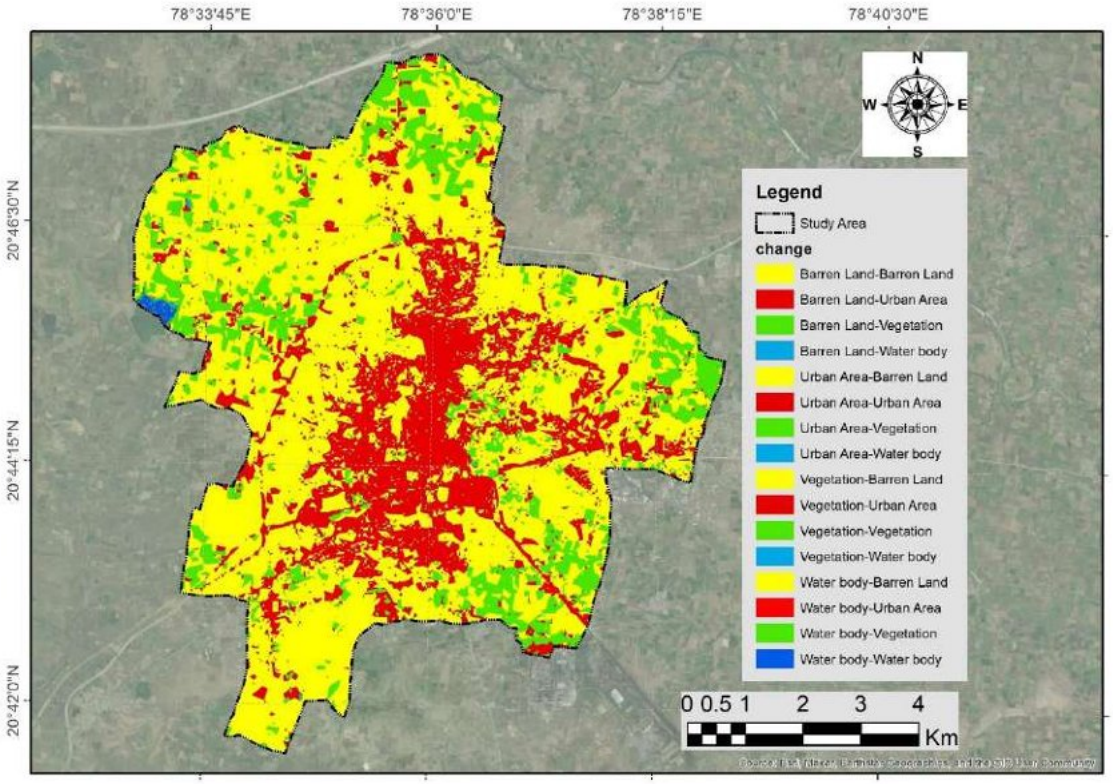


Figure 4: Change in Land Use from one class to another over the decade

The magnitude of the LULC alterations at Wardha City over a 10-year period have been discernible because to the application of remote sensing and GIS methods (2011-2022). The survey also revealed that the Wardha city has grown significantly in size. The newly constructed ring-road NH-361 Nagpur-Aurangabad Highway encircling the northern to western limits of the city is the major cause propogating peri-urbanization. This comprises of three villages namely Pipri, Sindi and Sawangi Meghe. The key-factor of development here becomes the rapid thorough transit of the ring road following a linear development of commercial activities. This further invites the housing sector causing conversion of agricultural land-use into residential land use in and around the commercial zones. However, the requirements of physical and social infrastructure are not well developed or planned for the projected population in such peri-urban areas. Need for inclusive and sustainable planning of these zones is very critical to mitigate negative development impact.

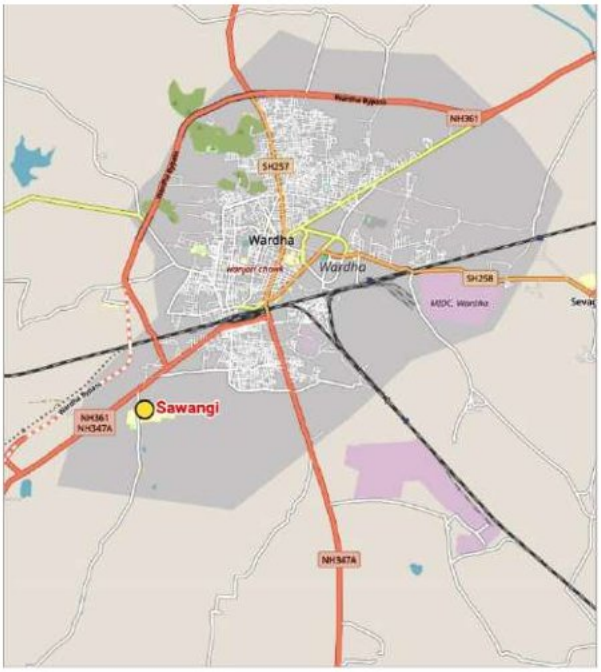


Figure 5 Nagpur- Aurangabad NH 361 Ring road

5. Observation and findings:

5.1. Observations

Growing rural-urban interdependencies: Interdependencies are expanding as borders become more hazy. Food, clean water, environmental services, and raw materials are just a few of the commodities and services that urban centres rely on from rural areas, including agriculture and natural resources.

Lack of coordination: There is a tendency for new building to take place in places where there are few laws or insufficient ones, and there is little to no coordination with the government. There is a problem with unlawful land ownership, and the levels of urbanisation in these settlements vary substantially.

Planning & Management: A jurisdictional conflict results from municipal growth. Planning and management are complicated as a result of the involvement of multiple agencies and their lack of coordination in the area.

Core city identity: Whether through migration or because of industrial or housing development projects, the process of population expulsion towards the hinterlands causes difficulties with decadence in the city's centre districts.

Conflict between two policies: On the one hand, there are those who support economic growth in these areas through the relocation of risky enterprises or new land uses. On the other side, we have lax agricultural and environmental preservation rules that make it difficult for productivity and environmental quality to compete with the financial pressures that come from developers driving up land values.

5.2. Findings

Due to land use changes, land grabbing, and environmentally negligent development aimed at growth by unsustainable means, the water supply in periurban areas, which was once secured by multiple water bodies in and around cities, is now in danger. Therefore, in the absence of any formal service provisions, people turn to a variety of informal ways or coping mechanisms to meet their requirements. Because traditional village ponds that were refilled by rainwater are disappearing due to development and other water sources are becoming less accessible, the peri-urban communities that are still engaged in smallholder farming frequently rely on recycled wastewater, which is becoming more and more contaminated. Indian rural-urban changes produce complicated, diversified, and risky conditions for agri-food systems, but they can also open up new opportunities if they are effectively planned.

6. Recommendations and conclusions:

6.1. Recommendations

Due to the importance of urban fringe areas to development, it is necessary to implement effective measures for reducing conflicts, enhancing the rural-urban interface, and gradually integrating urban and periurban areas into the process of urban growth and development. There is a need to design a model to limit and manage settlement growth in peri-urban areas at both the local and regional levels. Urban fringe definitional ambiguity results in subpar policy design, implementation, and policy/program evaluation. Therefore, it is vital to clear up any ambiguity in governance bylaws and agency jurisdiction.

Need for a suitable planning mechanism which would take care of the interactive process between various local bodies, and agencies of state & central government and also to plan and study the pattern of transformation. The planned growth of its periphery areas is essential to the sustainability of the metropolitan city model. Therefore, it is necessary to develop a framework for spatial planning that takes into account the principles of the 1992 Constitution (74th CAA). It is primarily necessary for all agencies' duties in governance and coordination to be completely clear. Social capital and the local initiative's role must be clearly defined and successful.

Control environmental deterioration: As cities grow, they destroy neighbouring green spaces, which has a negative impact on the ecological sustainability of urban and periurban areas. Control urban sprawl – a high rate of urban sprawl is caused by unauthorised and haphazard growth. It is possible to stop these haphazard expansions by studying Peri urban regions.

The supply of basic amenities and efficient transportation links into the city centre must go hand in hand with the construction of cheap housing in suburban areas. In order to overcome the difficulties of sustainable urbanisation, it is important to recognise the peri-urban interface and its marginalised residents as a vital frontier. Agri-food system support should be gradually combined with urban environmental management, health, nutrition, and poverty alleviation measures. Agricultural land use must be fully and efficiently incorporated into planning processes.

6.3. Conclusion

For a better understanding of the dynamics of urbanisation and urban transition, the urban periphery areas of India are among the most active places. Planning and policymaking work hand in hand to improve the quality of life in these places and address issues with the urban infrastructure of upcoming cities. India presents a distinctive condition of population growth and movement from rural to urban areas as well as from one state to another. This indicates that new settlers will be moving into cities for almost the next 50 years.

The constant and crucial concern for Indian planners would be the spatial transition of rural land into urban agglomeration. The effective management and transformation of periurban areas is crucial to the sustainability of both the economy and society. For greater growth, there should be more public participation.

The interface is a challenging area to plan for and administer in a way that will guide actions toward shared goals and objectives across stakeholders in the public, private, and social sectors. The interface is a complicated area with its own issues and plenty of development prospects. It is critical to keep in mind that these areas will, over time, integrate into the cities, and that they will need to adjust to the economic, social, and environmental dynamics of the metropolis to which they will eventually belong.

Due to its thorough understanding of the environment and its research of various interactions within the city-region system, sustainable development has emerged as a useful framework for addressing the rural-urban interface. The execution and oversight of management plans, however, presents a significant difficulty in the context of intricate governmental administrations.

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आयोजक

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पुणे

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('ऑनलाईन' प्रणाली द्वारे)

मराठी भाषा गौरव दिनानिमित्त सोमवार दिनांक २७ फेब्रुवारी २०२३ रोजी राज्यस्तरीय वास्तुकला मराठी परिषदेचे आयोजन करण्यात येत आहे. वास्तुकला विषयाशी निगडीत माहिती व साहित्य समृद्ध तसेच व्यापक आहे. परंतु तुलनात्मक दृष्ट्या, मराठी भाषेत या विषयावर पुरेसे संदर्भ, पुस्तके उपलब्ध नाही. परिषदेचे आयोजन मराठी भाषेत करून, पुढाकार व प्रोत्साहनाचा हा एक महत्त्वाचा प्रयत्न व सुरुवात ठरेल असा विश्वास आहे. वास्तुकला क्षेत्रातील यशस्वी मान्यवर प्राध्यापक वर्ग विद्यार्थी तसेच व्यवसायिक या साऱ्यांनाच व्यासपीठ उपलब्ध होऊन, त्या संबंधिचे लिखाण, सादरीकरण व चर्चा यास उत्तम प्रतिसाद लाभेल अशी खात्री आहे. विविध विषयांवरील उत्तम लिखाण शोधनिबंध पुस्तिका रूपाने प्रकाशित केले जाईल.

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काळानुरुप बदलत गलेले भारतीय वनांचे स्वरुप : त्यातील संकल्पनांचे पुर्नजिविकरण काळाची गरज

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भारतीय संस्कृतीमध्ये वृक्ष आणि वने या दोन्ही गोष्टींना वैज्ञानिकदृष्ट्या, पौराणिकदृष्ट्या, धार्मिकदृष्ट्या अनन्य साधारण महत्त्व आहे. पौराणिक काळातल्या अनेक कथा प्राचिन भारतीय भूदृष्यशास्त्राचे वर्णन दर्शवतात. शहर विकास आराखडे नसतांनाही, भूदृष्यशास्त्राच्या काही संकल्पना सिंधू संस्कृतीपासून उदयास पावलेल्या आहेत याचे पुरावे आपल्याला अनेक साहित्यांमधून वाचावयास मिळतात. हिंदू पुराणामधील व साहित्यांतील वनांचे महत्त्व, पर्यावरण, पर्यावरणशास्त्र, भूदृश्य वास्तूशास्त्र, गावाची रचना व वने यातील सहसंबंध यांचा आढावा घेणे या शोधनिबंधाचे प्रमुख उदिदष्ट आहे. शोधनिबंध सिंधू खोऱ्यातील संस्कृती ते स्वातंत्रोत्तर भारत यादरम्यान वनांचे बदलत गेलेले स्वरुप व त्याच्या अभ्यास या पुरते मर्यादित आहे. हा शोधनिबंध पुर्ण करण्यासाठी विविध साहित्य, पौराणिक कथा वाचन या पध्दतीचा वापर करण्यात आलेला आहे. या अभ्यासामुळे भारतीय संस्कृतीतील भूदृश्य वास्तूशास्त्रातील ऱ्हास पावलेल्या संकल्पनांचे पुर्नजिविकरण करण्यासाठी उपयोग होणार आहे.

परिचय :

सिंधू नदीच्या पात्रात उगम पावली ती हिंदू संस्कृती, पुढे ग्रीक लोकांनी हिंदूचे रुपांतर इंडस मध्ये केले, इंडस चे रुपांतर इंडिया मध्ये आणि मुस्लीम आक्रमणानंतर त्याचे झाले हिंदुस्तान ! आपली संस्कृती आणि देशाच्या नावामध्ये एवढा बदल होत गेला, तर स्थावर वने, जैवविविधता, नैसर्गिक संपत्ती या सर्वांवर विविध परकीय राजवटींचा किती मोठा परिणाम होऊ शकतो ? प्राचिन हिंदू संस्कृतीत जोपासत आलेले वन संरक्षण, वन सुरक्षितता, वने आणि गाव यांची सांगड, वनांवर आधारीत परंपरा, गावांची रचना हे सर्व परकिय आक्रमणानंतर बदलत गेले. सदर शोधनिबंधामध्ये लोप पावत चाललेल्या भारतीय वनांमधील भूदृष्यशास्त्रांच्या व शहर आराखड्यांच्या संकल्पना पुर्नजिवित करण्यासाठी त्यावर प्रकाश टाकण्यात आला आहे.

विभाग :

सिंधू संस्कृती :

जगातील प्राचीन संस्कृतीपैकी ओळखली जाणारी एक संस्कृती म्हणजे, सिंधू नदिच्या खोऱ्यात उदयास आलेली "सिंधू संस्कृती" (Indus vally civilization) कोणतेही गाव वृक्षांशिवाय पूर्ण होऊच शकत नाही असे सांगणारी ही संस्कृती ! म्हणूनच गावात आणि गावाच्या आजूबाजूला जंगलात

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आढळणाऱ्या काही विशिष्ट वृक्ष लावण्यात यायचे आणि जतन केले जायचे. या वृक्षांमध्ये पंचमहाभूते दर्शवणारी पंचवटी (पाच झाडे) असणे बंधनकारक होते. मानवी गरजा आणि कामकाज यांना लक्षात घेता वनांचे वर्गीकरण केलेले असे. वनांमधील मुख्य प्रकार म्हणजे, संरक्षित वनक्षेत्र, गावालगत असणाऱ्या या वनांना महावन म्हणत असत. एकाच जातींची विविध वृक्ष किंवा विविध जातीच्या वृक्षांची लागवड करुन उत्पादनासाठी आणि उत्पन्नासाठी असणाऱ्या या वनांना श्रीवन किंवा बनवारी असे म्हणत. गावापासून दूर अंतरावर असणारे वन म्हणजे, तपोवन, या वनांमध्ये एकही वृक्ष, वन्य पशु-पक्षी यांना इजा होणार नाही याची दक्षता घेतली जायची. या वनांचा उपयोग ध्यान-धारणा तपश्चर्या यांसाठी केला जात असे.

वैदिक संस्कृती :

संपूर्ण विश्वच जंगल आहे, असे माणनारी संस्कृती म्हणजे इसवी सन पूर्व १२००-५०० या दरम्यान आलेली वैदिक संस्कृती. या काळात, हिंदू संस्कृती जपणाऱ्या भूद्रुव्य वास्तूशास्त्राच्या (cultural landscapes) माध्यमातून देवराई (देवाच्या नावाने राखला जाणारा डोंगर), परिस्थितीकी विज्ञान (ecosystems) अश्या संकल्पना मांडण्यात आल्या, आजही आपल्याला काही देवराई पहावयास मिळतात. प्रि वैदिक संस्कृतीची ही काही ठळक वैशिष्टये पोस्ट वैदिक काळातही चालू ठेवण्यात आली. जंगलांबरोबरच, गावातील घरालगतच्या छोटया छोटया जागांचे देखिल जंगलात रुपांतर करण्यांत येत असे. मंदीर वने (Forest temple), मठ वने (monasv forest), पवित्र वृक्ष (socread tree) अश्या संकल्पना या काळात मांडण्यात आल्या, ज्या आपल्याला आजही काही प्रमाणात पहायला मिळतात. विविध सणावारांना पुजले जाणारे वृक्ष म्हणजेच पवित्र वृक्ष हे वैदिक काळापासून चालत आलेली परंपरा आहे. चरक आणि सुश्रुत संहिताही याच काळात लिहीला गेला.

मौर्यन राजवट :

इसवी सन पूर्व ३२२-१८८५ म्हणजे चंद्रगुप्त मौर्य राजाचा काळ. या काळात जंगल व्यवस्थापन आणि वनांचे संरक्षण यावर भर देण्यात आला. फळबागा, वने यांचा वापर मनोरंजनापेक्षा उत्पन्नाच्या वस्तु आणि महसुलासाठी केला जावू लागला. चंद्रगुप्त राज्याच्या राजदरबारातील कौटिल्य हया एका मंत्र्याने अर्थशास्त्र नावाचे एक पुस्तक लिहिले, त्यामध्ये पाणीपुरवण्याचे तंत्रज्ञान, मृदसंधारण, पर्जन्यवृष्टी आणि भौगोलिक माहीती यांचा समावेश आहे. यावरुन त्या प्राचीन काळातील या गोष्टिंना दिले गेलेले महत्त्व स्पष्ट होते. यापुढील राजवट म्हणजे राजा अशोकाची, इसवी सन पूर्व २७३-२३७ चा दरम्यान होऊन गेलेल्या या राजाच्या राजवटीमध्ये वन संरक्षंण, वन्य प्राणी, वन संरक्षण आणि त्यांचे जतन यावर काम करण्यात आले. याशिवाय मोठया प्रमाणावर वृक्षलागवडीचा उपक्रम अशोक राजाने राबवला आणि हाच उपक्रम पुढे, गुप्त राजांच्या राजवटीतही सुरुच राहीला.

मुस्लीम राजवट :

इसवी सन १०००-१७५० पासून भारतात मुस्लीम राजवटींनी सत्ता प्रस्थापीत करण्यास सुरुवात केली. निष्णात शिकारी असणारी ही मंडळी, जंगलात शिकारीसाठी जावू लागली. पुढे तेथेच छावण्या

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टाकून शिकार केली जावू लागली. त्यासाठी जंगलतोड सुरु झाली (छावण्या बसवण्याच्या उद्देशाने). हिंदू राजांवर त्यांची आक्रमणे चालूच होती, परिणामी, मुस्लीमांच्या हमल्यांपासून वाचण्यासाठी स्वत:च्या संरक्षणासाठी सामान्य नागरिक जंगलांमध्ये स्थलांतरीत होऊ लागले आणि हयाच काळात नागरिकांच्या स्थलांतरामुळे आणि मुस्लिम छावण्यांमुळे मोठया प्रमाणात जंगलतोडीस सुरुवात झाली.

मुघल राजवट :

इसवी सन १४८३-१७५७ च्या दरम्यान आलेली मुघल राजवट. या काळात, मुघलांचा कल जास्त प्रमाणात बगीचा तयार करणे, त्यांचा विकास करणे आणि त्यांच्या सजावटीवर होता. अकबर राजाने त्याच्या काळात मोठया प्रमाणात वृक्षारोपण करा असे आदेश दिले खरे, परंतु त्याचा अधिक कल बगीचांकडेच होता. पुढे, सुंदर बगीचे आणि त्यात काही प्रमाणात वृक्षारोपण करणारा राजा म्हणुन, राजा जहांगिराची ओळख झाली.

ब्रिटीश राजवट :

इसवी सन १७५०-१९४७ म्हणजे ब्रिटिश राजवटीचा काळ. वनांचा ऱ्हास व्हायला सुरुवात झाली तो हा काळ. परिणामांचा काहीही विचार न करता साल, साग, चंदन अश्या देशी वृक्षांची तोड होऊ लागली. या वृक्षांच्या लाकडांचा उपयोग जहाज बांधणीसाठी करण्यासाठी याची मोठया प्रमाणावर निर्यात होऊ लागली. सामान्य जनता, जैवविविधता या कशाचाही विचार न करता ही जंगले आपल्याच मालकीची असल्याच्या भावनेतून ही जंगलतोड सुरुच होती. सागाचे उत्पादन आणि जहाजबांधणीसाठी उपयुक्त असणाऱ्या इतर (लाकडांच्या) वृक्षांचा उत्पादनावर लक्ष घालण्यासाठी मद्रास सरकारने इसवी सन १८०६ मध्ये जंगल अधिकारी म्हणून वॅटसन या गोऱ्या अधिकाऱ्याची नेमणूक केली. इसवी सन १८५५ मध्ये मलबर टेकडीवर सागाच्या आणि निलगिरी डोंगररांगांवर बाभळीची अधिक प्रमाणात लागवड करण्यांत आली आणि याचा जैवविविधतेवर दुष्पपरिणाम होऊ लागला.

साधारणत: वनस्पतींना आधारित ठेवून, जंगल तीन स्तरांमध्ये विभागलेले असते. जमीनीपासून साधारण एक फुट अंतरापर्यंत वाढणारा म्हणजे सर्वांत खालचा वनस्पती स्तर. यामध्ये विविध किटक, सरपटणारे प्राणी यांची वस्ती असते. त्यानंतर जमीनीपासून दोन ते तीन फुट उंची पर्यंत वाढणारा स्तर म्हणजे झुडपांचा. यामध्ये फुलपाखरे, लहान आकाराचे (लाजाळु) पक्षी यांचा प्रामुख्याने समावेश असतो. यापुढील स्तर म्हणजे जमीनीपासून आठ ते दहा फुटापर्यंत वाढणारी लहान झाडे. या स्तरामध्ये वस्ती करणारे जीव म्हणजे मध्यम आकाराचे पक्षी. शेवटचा आणि जंगलातील सर्वात वरचा स्तर म्हणजे मोठे वृक्ष. यावर वस्ती असते ती मोठया आणि बलाढय पक्ष्यांची. अश्याप्रकारे विविध प्रकारच्या वनस्पती जिवांवर जंगल साखळी अवलंबुन असते. एकाच प्रकारच्या वृक्षलागवडीने जंगलांचा समतोल बिघडतो. त्यामुळे ब्रिटीश काळात केले गेलेल्या सारख्याच जातीच्या वृक्षलागवडीमुळे भारतीय जंगलांचा समतोल बिघडण्यास सुरुवात झाली.

इसवी सन 1865 ते 1894 च्या काळात राजघराण्यांना लागणाऱ्या साधनांसाठी आणि जंगल उपयुक्त वस्तुसाठी वने आरक्षित करण्यात आली. वनांच्या पुनरउत्पादनासाठी, कापणी साठी आणि वने

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टिकवण्यासाठी 18व्या शतकापासूनच शास्त्रोक्त पध्दतीने जंगल व्यवस्थापनाची सुरुवात करण्यात आली. इसवी सन १९२६ ते १९४७ च्या दरम्यान पंजाब आणि उत्तर प्रदेशामध्ये मोठया प्रमाणावर वृक्ष लागवड करण्यात आली तर इसवी सन १९३० च्या सुरुवातीला जनतेने वन्य प्राण्यांच्या संरक्षणासाठीच्या उपाय योजनामध्ये भाग घेण्यास स्वारस्य घेतले.

दुसऱ्या महायुध्दाच्या दरम्यान जंगल व्यवस्थापन आणखिन शास्त्रोक्त पध्दतीने करण्यासाठी आणि जंगलांचा बराचसा प्रदेश पुर्नउत्पादीत करण्याच्या दृष्टिने आखणी करण्यात आली. परंतु अजुनही भर मात्र जंगल संरक्षण नसुन, जंगलांमधुन अधिकाधिक महसुल उपलब्ध व्हावा हाच होता. ब्रिटनला युध्दकाळात मदत व्हावी म्हणून जहाज बांधणी आणि रेल्वेच्या कामासाठी अधिक लाकुड निर्यात होवू लागले आणि त्यामुळे जंगलतोडही अधिक प्रमाणात होवू लागली आणि जंगलांची खुप मोठया प्रमाणावर हानी झाली.

स्वातंत्र्योत्तर काळ :

स्वातंत्र्योत्तर काळामध्ये 1952 च्या नवीन धोरणाप्रमाणे वनांच्या संरक्षणाच्या उद्देशाने, भारतातील एक तृतियांश भाग वनांखाली असावा अशी तरतूद करण्यात आली, परिणामी जंगलातील काही क्रियाकलाप आणि गुरांचे चरणे यांवर बंधने घालण्यात आली. ब्रिटीश काळात रिझर्व फॉरेस्ट खाली प्रोटेक्टेड फॉरेस्ट हे वर्गीकरण जसेच्या तसे ठेवण्यात आले. १९७६ मध्ये वन्य संरक्षण वाढवणे आणि वनविकासाच्या माध्यमातून आदिवासींना रोजगार मिळावा यासाठी उपक्रम सुरु करण्याचा निश्चय करण्यात आला.

निष्कर्ष :

सिंधू संस्कृतीत सांगितलेले वनांचे प्रकार आणि त्यांच्याशी निगडीत असणाऱ्या क्रियाकल्प विलोप पावले. वैदिक काळातील मठ वने, मंदिर वने या संकल्पना लोप पावलेल्या असुन, या काळात घरालगतच्या छोट्या जागांवर वने बसवण्यात येत असत ती पुर्नजिवित करणे काळाची गरज आहे. चंद्रगुप्त मौर्याच्या काळात ज्याप्रमाणे उत्पन्नाचे साधन म्हणुन वनांकडे बघण्यात आले त्याप्रमाणे आजही वृक्षारोपण करतांना फळझाडांना प्राधान्य दिले तर उत्पन्नवाढीसाठी सरकारला याची मदत होईल. मुस्लीम राजवटींच्या काळात जंगल तोडण्यास सुरुवात झाली व मुघल राजवटींचा जास्त कल बगीचा सुशोभिकरणाकडे असल्यामुळे वनांकडे असल्यामुळे जंगलव्यवस्थापन, संवर्धन मागे पडू लागले. ब्रिटीश काळात बिघडत गेला आणि आपल्या भारतिय संस्कृतीशी वनांशी निगडित असलेल्या संकल्पना लोप पावल्या आणि देशी, औषधी आणि संस्कृती जपणाऱ्या आपल्या वृक्षांची जागा विदेशी वृक्षांनी घेतल्यामुळे जंगल साखळी आणि पर्यावरणाचा समतोल बिघडत गेला. आपली संस्कृती जपण्यासाठी, आपल्या संस्कृतीचा वसा पुढे नेण्यासाठी आणि आपली गावे, शहरे संस्कृतीक दृष्ट्या संपन्न बनवण्यासाठी, संस्कृतीक भूदृष्य वास्तुशास्त्राच्या मदतीने गावांची रचंना करणे गरजेचे आहे. आपल्या पूर्वजांनी सांगितलेल्या देशी वृक्षांचा समावेश वृक्षारोपनांमध्ये करण्याबरोबरच, पुर्वापार चालत आलेल्या वनांमधील सांस्कृतिक संकल्पनांचा समावेश शास्त्रोक्त पध्दतीने करणे गरजेचे आहे. वन, वाटीका, उपवन, उदयान,

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आरण्य, अभयारण्य, तपोवन, महावन, श्रीवन, देवराई, मंदिर वने, मठ वने अश्या संकल्पना पुन्हा आणि अधिक प्रमाणात प्रत्यक्षात उतरवून ऱ्हास पावत चाललेल्या आपल्या मौलिक संस्कृतीचा वसा अश्या प्रकारे जतन करण्यांत हातभार लावणे गरजेचे आहे.

संदर्भ :

1. लेखक : आर्कि.नुपुर प्रोथी खन्ना, पुस्तक - एन्शीयंट लॅण्डस्केप हिस्ट्री : पान नं. 14 ते 16
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NO	List of Book/Chapter
2021-22	
1	Changing Cultural Landscapes along The Shorter And Longer Circumambulation (Pheri) Of Trimbkeshwar
2	Kathi-Kuni construction technique and CLT (cross laminated timber) construction technique for rural settlement in case of Shimla, Himachal Pradesh
3	Development of Dado ornamentation in Mughal Architecture
4	Role of context in development of Rural Housing in Junnar, Pune District, Maharashtra
5	Role of Openings in Different Climatic Zones in the view of Sustainability
6	The Impact of Lockdown on the Movement of Disabled People in Rural Region - Akole, Ahmednagar
7	Study of Values Associated with Rural Open Space (Villages of Western Maharashtra)

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INTACH Pune Chapter

Ahemednagar Centre Maharashtra Chapter

Changing Cultural Landscapes along The Shorter And Longer Circumambulation (Pheri) Of Trimbkeshwar

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Abstract:
Pilgrimage town of Trimbakeshwar is also known for Circumambulation (pheri), a holy walk around Brahmagiri Mountain, the origin of river Godavari and Harihar hill on the occasion of third Monday of the month of Shravan. First shorter loop (pheri) is around Brahmgiri hill and nil mountain, swhich takes around 6-7 hours. Second longer loop (pheri) is around Brahmgiri hill and Harihar hill, also covers Nil mountain and Brahma mountain. This takes around 12-13 hours. This paper is aiming to study and analyze the changing religious anchors along the shorter and longer circumambulation of Trimbkeshwar on the basis of Mythological and Current followings. Objectives of the study are To study shorter and longer circumambulation of Trimbkeshwar as per Mythology and Current followings, To study and analyze the significance of religious anchors along circumambulation, To map the path of shorter and longer circumambulation and religious anchors along it. To analyze religious anchors along circumambulations as per Mythology and Current followings. Primary Data for the study is collected through site visit, interview, mapping methods. Secondary data is collected through literature study. This study will help to throw light on forgotten and lost Tirthas and pause points on both the circumambulations. These forgotten and lost Tirthas and pause points are having strong religious, mythological and geographical significance. They are rural heritage which needs to be reviving through landscape conservation.

Keywords:
Circumambulation, Trimbakeshwar, Cultural Landscapes

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THEME II: CURRENT ISSUES IN RURAL AND REGIONAL PLANNING

THEME III: ECONOMY

THEME IV: ENVIRONMENT

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KATHI-KUNI CONSTRUCTION TECHNIQUE AND CLT (CROSS LAMINATED TIMBER) CONSTRUCTION TECHNIQUE FOR RURAL SETTLEMENT – IN CASE OF SHIMLA HIMACHAL PRADESH

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Abstract: Comparative analysis of Kathi-kuni construction technique and CLT (Cross Laminated Timber) construction technique for a residential unit. This research is aiming to do the comparative analysis of 2 construction technique which is Kathi-kuni and CLT which is best suited in Himachal Pradesh. Objectives of study are to calculate the cost, structural framework and availability of material, then classify data and analyze it, to identify today's need of users on various aspects. The general purpose of the study is to compare the 2-construction techniques. This research needs to study the Residential unit. This research needs a duration of 1-2 months. The study is going to cover the aspects like cost, safety, environmental aspects, earthquake resistant, horizontal spread and its vertical spread. The Geographical location covered in the study is Himachal Pradesh. Methodology would be conducted through literature review and book case study. This research is necessary to get best possible outcome as the regional people will be hugely benefitted due to affordance of cost and can reduce and lock carbon emission. This research is not going to cover any type of building except residential buildings. The research will throw light on the Kathi kuni and CLT Construction technique its impact of wood and its awareness. This research will show how CLT will change the people's life. From this research it is found that Reason for building (Kathi-Kuni) is getting older and the advancement of material led to occupants to consume more energy to create a comfortable zone for themselves.

Keywords: CLT, Kathi-kuni, Himachal Pradesh, Construction technique

1. Introduction :

1. Problem statement: Studying Kathi kuni and CLT construction technique for comparative analysis to identify and understand today's need of users on various aspects like cost, occupants comfort and availability.
2. Motivation of research: This research focuses on things which can harm less to environment so then came across a processed wood (CLT) video which caught my attention due to its enormous benefits
   Then thought about comparing it with regional techniques
3. Brief summary: Kathi kuni is the native construction technique of Himachal Pradesh and CLT is been used in Australia and western countries and is immensely liked over those area due to its cost reduction and can be used in sky scrapers.
4. Description of gap in literature:
   The research did not include approximate cost of CLT construction technique as well as kathi-kuni

5. How important is it for the industry practice /knowledge advancement: Industry practice or knowledge advancement will increase employment of skilled labor?

6. 

Map showing selected region

2. Aim:

The comparative analysis of 2 construction technique which is Kathi-kuni and CLT which is best suited in Himachal Pradesh.

3. Objectives:

1. To study the Cost, structural framework and availability of material.
2. Then classify data and analyse it.
3. To identify today's need of users on various aspects.

4. Scope:

The general purpose of the study is to compare the 2-construction techniques. This research needs to study the Residential unit. This research needs a duration of 1-2 months. The study is going to cover the cost, economical, less hazardous, earthquake resistant, horizontal spread and its vertical spread. The Geographical location covered in the study is Himachal Pradesh.

5. Limitation:

This research is not going to cover any type of building except residential buildings.

6.Methodology:

Literature review by reading various research papers

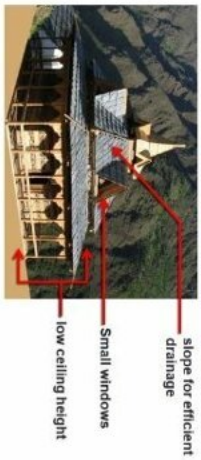
↓

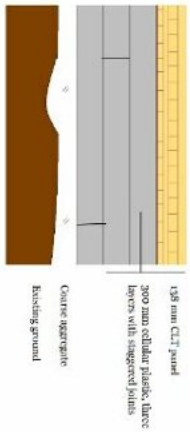
Data collection by selecting appropriate data for the research

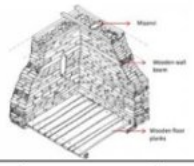
↓

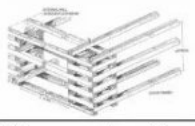
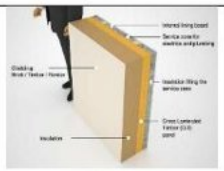
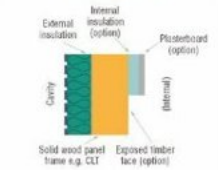
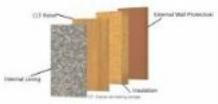
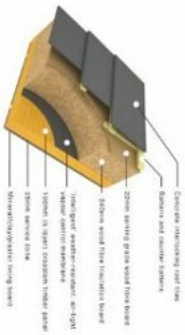
	'kona' for corner.	dried dimension lumber		
Origin	Himachal Pradesh	Austria and Germany	Due to its climate the need of this techniques emerged	--
Year of origin	**no less than 500-years-old** according to local legend	1990	Kathi kuni has deeper roots than CLT	--
Type of wood used	Deodar/ kali	Spruce	Both are soft wood which grow quicker than hardwood and are cheaper, softer and easier to work	We can use those 2 types of wood
Materials used for construction	Stone (igneous), Wood and Slate (metamorphic).	Solid wood panels clad with other materials such as timber, brick, render or composite panels.	Kathi kuni has natural materials and CLT has processed materials	Materials used in Kathi kuni can cheaper and affordable
Spread of technique	It has been transmitted orally and empirically from one generation to the next, through apprenticeships spanning a number of years	Early engineering research occurred first in Switzerland and then in Austria during 1990's It is now been accepted by many countries.	Kathi kuni is spread orally and CLT is spread by research publication	--
Labor costs	Construction of the houses is done by hands with the help of people from neighboring villages or by the residents themselves and is passed on from generation to generation.	Labor demands for CLT projects are also less. In a tight labor market, this can be significant.	In percentage vise the kathi kuni is 50% Cheaper than CLT	kathi kuni is cheaper than CLT
Interior	It is can be left exposed from interior or can be covered with mud plaster giving these	CLT can be left exposed in building interiors up to 8 stories	No interior finishing is needed in case of kathi kuni and CLT can be left	In both the techniques walls can be left exposed

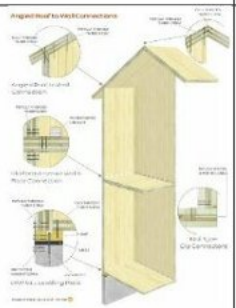
	structure excellent insulation		exposed up to 8 stories	
Horizontal spread	7m×4m - Rectangular 5m×5m- Square Till now seen	As per requirement any size	There is a limitation in kathi kuni and but in case of CLT the structure is of any size	CLT has no limitation horizontal spread
Vertical spread	Allows the structure to rise up to as high as 7 floors	Allows the structure to rise up to 650 meters	Height is restricted up to 7th floor unlike the CLT which can go up to 20th floor	CLT has no limitation vertical spread
Type of structure	Load bearing	Framed structure	Framed structure is considered more stable than load bearing	In CLT space required is less as stable
Elements of house	Ground level- Work as storage or shed for cattle 1st 2nd & 3rd Floor- House rise up to 3rd floor only Low Height of the rooms (2.1-2.4), keeps interior warmer from heat released by individuals, also low surface to volume ratio reducing heat loss from surfaces	It has structural components like floor, roof, and wall which are prefabricated in factories	The kathi kuni can be fully made of vernacular	
Climate Influence	Small window size and low ceiling height to prevent heat loss and keep the interiors warmer. Terrace in all around the building should have proper slope for efficient	No restriction of sizes of window or ceiling or roof 	In case of kathi kuni vernacular technique is adapted to tackle the climate and in CLT the vernacular with respect to modern aspects are considered	In case of CLT window sizes can be kept large as per users need no size restriction

	drainage, in heavy rain fall and snow fall areas.  			
Foundation	The foundation consists of hand packing of stones without any mortar. The foundation depth ranges from 3-4 feet for loose soil. First the owner is given the area where he can construct his own house. The owner brings all the materials needed to construct his house. The owner also hires the carpenter and 2-3 workers for constructing his house. The carpenter sets the area for constructing the houses as a square or a rectangle accordingly, and checks all the dimensions with	It consists of a lightweight construction where the concrete slab is replaced by a 138 mm thick CLT panel with an underlying layer of cellular plastic which gives an average U value of 0.089 [W/m2 .K]. The edges of the foundation structure have been fitted with fiber cement clad cellular plastic boards. In view of its light weight the foundation is anchored by four earth anchors to prevent the foundation from moving under high wind loads. The earth anchors are attached to fittings in the	The foundation of kathi kuni is bigger than the CLT. The material used in foundation of building in kathi kuni is just stones without mortar unlike the CLT where concrete slab, CLT panel are used.	In both of the technique's foundations are appropriate

	measure tape and verifies it by measuring the diagonals set. Then he lays a thread as line out (for the boundary) and starts arranging stones in the trenches. Small stones are fixed in between the large ones for proper bounding.  	CLT foundation panels. 		
Flooring	Material used for flooring are wooden plank and Nails, Cow dung and mud plaster is done on the ground floor Wooden beam is used as a support for the wooden planks laid and nailed on wooden beam which acts as the floor. There are two wooden beams on the top of opposite walls and on in the middle laid parallel to the walls and on in the middle laid	Pre-fabricated floor is fitted	Mud flooring and wooden flooring is used in kathi kuni and prefabricated flooring can be seen in CLT flooring	Life span of kathi kuni flooring is less than CLT as Kathi Kuni has lesser life span

	parallel to the wall. Then wooden planks are laid on the beam in the other direction (horizontally) and connected with nails. 			
Wall construction	The stone walls are load bearing with a thickness of 480mm. It involves laying of two wooden beams longitudinally parallel to each other with a gap in between. This gap is filled with aggregates. The walls are constructed with an alternate course of dry masonry and wood without any cementing mortar. These wall provide a very good thermal insulation by giving high time lag of more than 8 hours. The wall above the plinth level is strong with an alternate layer	Multiple layers use with CLT for such as **weather protection** (on the outermost wall), **insulation**, **CLT Panel**, and **Internal Lining** (From the inside). This is very important for external walls. CLT is an environmental-friendly building material. Its use does not cause any harm. This material is used to reduce energy consumption.	Walls are very thick in kathi kuni as compare to CLT Walls of kathi kuni are cast in-situ and in case of CLT it is prefabricated	Space required is more in case of kathi kuni for the wall construction and in case of CLT less space is required as Prefabricated planes are used

	of stones and wood. This distributes the mass equally. So the construction of walls without use of cement mortar and dry stone masonry allows the stone to oscillate within the flexible wooden frame work to allow the energy of earthquake to disperse, leading to settlement of energy and the structure staying intact.  	  		
Roofing	The constructing from foundation to roof does not involve the use of mortar in the courses of stone, the sheer weight of dry masonry and the roof in slate stones holds the structure down in place. Traditionally no metal nails were used in wood courses instead strategically inserted wooden	It is factory made 	No mortar in used in both cases as in kathi kuni interlocking of slate stones is done and in CLT prefabricated panel are used	In case of kathi kuni hand picked tiles are used which are easily available and in case of CLT the need to be brought from factory

	braces and joints held the structure together. Nail-less framework without rivets and not rigid construction allows the building flex with the seismic waves and effectively dissipate the energy of earthquake. 			
Details	 Images of wall construction at Devi Dhar village, which show the dry masonry construction with in-fill and lap jointed members at the corner.  Corner detail; wooden members are notched and lap jointed so that they intersect at the corner and further supported by cantilevered		Different details can be seen in both the techniques	In kathi kuni there is no requirement of skilled labor and in case of CLT skilled labor are required to installations.

	member fixed at one end in the wall.			

8.Conclusions:

Reason for building (Kathi-Kuni) is getting older and the advancement of material led to occupants to consume more energy to create a comfortable zone for themselves.

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DEVELOPMENT OF DADO ORNAMENTATION IN MUGHAL ARCHITECTURE.

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Abstract: Development of dado ornamentation, this research is aiming to do the study of evolution of dado ornamentation in the era of various emperors. Research is Mainly focused on descriptive and historical approach that is based on studies of Mughal architecture as it evolved under succession of emperors beginning with Babur, Akbar, Jahangir, Shah Jahan and then Aurangzeb Objective of study are to understand, from which period dado ornamentation start, which changes happened in ornamentation in 15^{th} to 17^{th} century, analyzes the changes and synthesis the evolution of dado ornamentation in the aspects of motifs, material, form, color. By studying the various structures in the era of above emperors, we achieve the proposed objective. case study method is use for research. We can synthesize the difference between dado ornamentation by studding different monuments. From the case study it is conclude that, transformation of ornamentation from Babur to Aurangzeb period is with free-flowing to geometric forms. Material changes from stone, black marble to white marble. The research has truism, historical, cultural, educational and aesthetical values.

Key words- dado ornamentation, emperors, evolution, culture, art.

Introduction:

- Mughal decorative art of dado ornamentation is one of the remarkable features of Mughal architecture that display their artistic sense into form of beautiful design blended into vibrant colours and mosaics. this particular ornamentation starts in during Babur period up to the Aurangzeb period.
- Curiosity and interest develop while study about Taj mahal decorative carving, to know the how Mughal time artist carved beautiful ornamentation with the detailing?
- Research is Mainly focused on descriptive and historical approach that is based on studies of Mughal architecture as it evolved under succession of emperors beginning with Babur, Akbar, Jahangir, Shah Jahan and then Aurangzeb.
- In earlier research paper, researcher research only about materials and colours and not about forms.
- Research is help for tourist to getting knowledge about the dado ornamentation and employment for the local people in tourist spot as a guide.

Aim: To study the Evolution of dado ornamentation in the era of various emperors.

Obectives:

1. To understand, what is dado ornamentation?
2. From which period dado ornamentation start.
3. Study the changes happened in ornamentation in 15th to 17h century by the study of different monuments in that particular period.
4. Analyses the changes and synthesis the evolution of dado ornamentation.

Scope:

- Purpose of study is to diagnosis how dado ornamentation changes according to emperor.
- Some monuments like Kabul Bagh Mosque, Humayun's palace, red fort, Akbar tomb Sikandar, Taj mahal, Badshah mosque etc. are studying.
- Material, uses according to emperors, forms of ornamentation, are studying while research.
- Delhi, Lahore, Agra, Fatehpur Sikri etc. are geographical places include in research.

Limitations:

Limitation of research is ,How Dado ornamentation changes according to philosophy of emperors? Is not going to cover in research

1. Find examples
2. Do the case study
3. Analyses the required topic

Methodology:

studying the various structures ↓

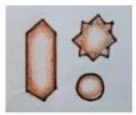
Case study method is use for research. ↓

Analyse the case study

Need of the topic:

Earlier researcher had not thought about the use of dado ornamentation in various ways, various purposes. data does not include information about the how various emperor use it accordingly.

The research is useful for tourist, for architects and artist for their innovative work, when people know the importance of this ornamentation, they conserve it.

Sr. no	Mughal emperor	Famous building(mosque)	material	color	Dominated elements	Forms	Motifs	Inferences	observation
1	Babur 1504-1530	Kabul Bagh at Punjab, 	Red sand stone, brick and stucoo plaster	Monochromatic red	 use on gate	  Simple forms are use	Babur use dado only for decorative purpose	Dado ornamentation just introduce at the Babur period, so it is rarely use	Generally dado ornamentatio use for highlighting the specific element of monuments .
2	Humayun 1530-1556	Humayun's place at Delhi called Din Panah. Mosque at fatehbad in the hisar district 	Red sand stone, brick and plaster	Monochromatic red	  Use on domes	  Geometrical forms were use	Humayuns use geometrical forms only for asthatical purpose and highlight the feature	Himayuns use dado rarely or at specific space of monuments	

3	Akbar 1556-1605	Jama masjid 	Red sand stone	Monochromatic red	  use on gate	  Use of geometrical as well as floral forms	Akbar use dado for asthetial purpose as well as show their culture and values.	Akbar is impresess by the dado . so, he extensively use dado in his period
4	Jahangir 1605-1627	Pattha r mosque 	Whit e marble	Poly chromatic (multicolor with the use of stones) white	 use on domes and gate	  Use of organic shape	Use of organic shapic to depict their religion and cultural value	jahangir pramote the art of dado use it creatively
5	Shah Jahan 1627-1658	pearl Mosque Lahore. 	Whit e marble	Poly chromatic multicolor with use of stone	 Use on profile of building	  Use of organic shape	jahangir use organic shape for asthatic purpose and make symbols showing islamis culture.	Shah jahan is very impress by the dado ornamentation he use dado in every monuments which is built by him. By the dado use he shows the equality in every religion by using symbols

6	Aurangzeb 1658-1707	Badshah Mosque Lahore	Red sand stone brick and plaster	Monochromatic red	Use in all parts of monuments	Use of floral shapes extensively	Aurangzeb use floral shape for mosque to depict hindu as well as islamic culture and also for asthetic	Aurangzeb use dado but he is not impress by the dado like above emperors. therefore, after aurangzb dado ornamentation we can not see.

Conclusion:

- Transformation of dado ornamentation from Babur to Aurangzeb period is with free-flowing floral forms to geometric forms.
- Material changes from stone, black marble to white marble.
- Every emperor tries to magnified dado ornamentation according to their necessity and choices with the addition of previous stage of dado ornamentation.

Refrance:

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Role Of Context In Development Of Rural Housing In Junnar, Pune District, Maharashtra.

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Abstract: Junnar is a taluka in Pune district, Maharashtra and it was declared as first tourism taluka in Pune by Maharashtra government in 2018. The research focus on aspects of rural housing, growth pattern of their settlement, issues like planning, orientation, form, surface, architectural typology of structure .This research to find out the role of context in development of rural housing at Junnar covers the introduction of traditional rural houses, architectural features, context, street grid pattern, study of climate responsive materials, their properties and co-ordination with respect to local climate etc. The study deals with the social, political, economic and climatical background by live case-studies and book case-studies, etc. Methodology would be conducted by survey, live case-studies, discussion with residents, settlement evolution study and then identifying their problems, define their solutions like construction techniques. This study is limited to Junnar town and it include only the study of old houses and Wada. Modern architecture noticed here has control the new developments are inappropriate because it may be introduced without consideration for local climate and cultural need of the people. Most of the old structures get renovated by new techniques so this will be beneficent to maintain these structures with their original old techniques. This research will also beneficiate to the people who work here related to construction.

Keywords: rural housing, context, settlement grid pattern.

1. Introduction-

Junnar has heritage places and historical background, as it has 2000years old prosperous history as Junnar was sub capital of Satvahana dynasty. there is the birthplace of Chhatrapati Shivaji Maharaja, Shivneri fort, and also have other six forts as Jivdhan fort, Shindola fort, Nimgiri fort , Chavand fort, Hadsar fort, Narayangad fort , Lenyadri caves, more than 350 caves of Buddhist , Jain , and Hindu caves with ancient inscriptions . it has religious places as Vigneshwara temple , Shri Girijatmka Ganpati temple etc. Naneghat is an ancient place in Junnar it has 2000 years old importance. Leyadri caves, Darya ghat, so many waterfalls are there. There are five main dams and 183 villages in Junnar taluka.

1.1 Introduction to the topic-

1. To study the relationship between the settlement pattern & surrounding context at the macro level & the effect of natural & cultural variables on architecture.
2. Motivation of research is cluster planning & traditional housing of Jaisalmer city & try to find out such characteristics of Junnar village.

3. The study deals with the issues like planning, orientation, form, surface, architectural typologies, and building techniques with respect to surrounding context.
4. It deals with the growth pattern of settlement.
5. The research focuses on aspects of traditional structures in Junnar.
6. It deals with the study of different types of houses.
7. The only gap in literature is there are modern houses present in large scale as compared to traditional houses.
8. This research will beneficiate to the people who work here related to construction.
9. It is also help to visitors / tourist to get familiar with this region.

1.2 Introduction to the study area-

1. Study area is the main village Junnar.
2. It is an ancient village and therefore there are so many old structures such as Wada, forts, two floor houses, and ground floor houses, with their original characteristics of Maratha architecture.
3. Settlement pattern of village is also different which is developed according to surrounding factors from ancient time.
4. Architecture of this region is a result of social, cultural, economic, climatic factors.

1.3 Aim-

To find the role of context in development of rural housing in Junnar.

1.4 Objective-

1. To collect the information related to climate analysis & surrounding factors, historical background, cultural factors etc.
2. Comparative study of current houses & old houses.
3. To develop a table format for techniques observed during live case studies.
4. Study of climate responsive materials, their properties & co-ordination with respect to local climate.
5. To study the grid pattern of settlement.
6. Find out merits & demerits of techniques used in Junnar for warm & humid climate.

1.5 Scope-

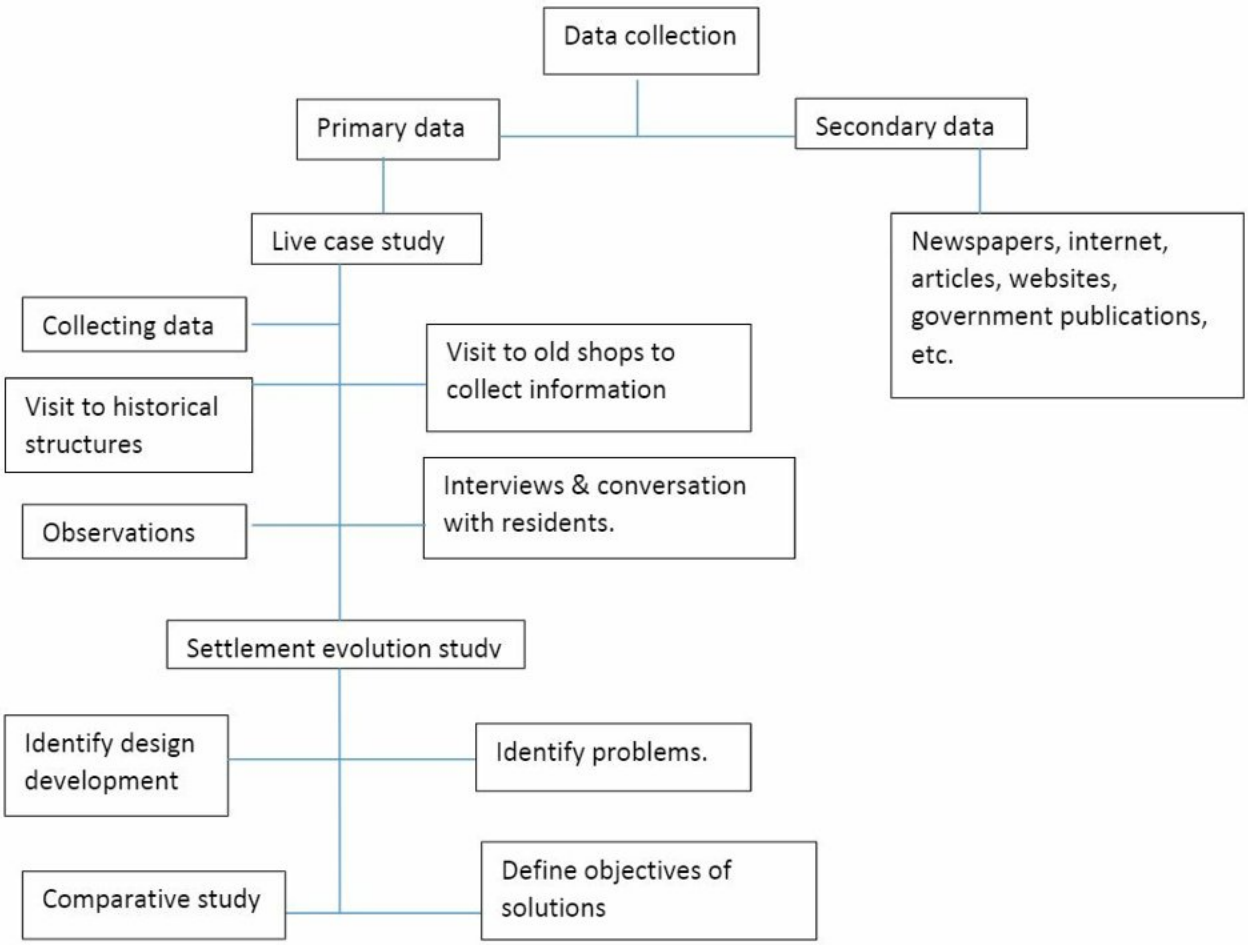
General purpose of the study is that find out the special features in structures with respect to surrounding context in this town. Why the structures found here are differ with structures in other region / towns. Study include only main village Junnar & no other sub villages. Duration of study is 3 to 4 weeks. Topic & theories – growth pattern of settlement, climate responsive local materials, study of traditional houses & Wada

1.6 Limitations-

The study area would be limited to Junnar and all the techniques that have been observed in this village.

1.7 Methodology-

It include the primary and secondary data collection by various methods as follows-



1.8 Need of the topic-

To well-maintained traditional houses, with their original features. Most of the old structures get renovated by new techniques, so this research will helpful for them to use the original old techniques. This will be beneficent in future & in present for the people who wants to work here related to construction. To conserve and cultivate structures socially, economically, climatically .Modern architecture observed here has dominated the new developments are inappropriate because it may be introduced without consideration for the local climate & cultural need of the people.

1.9 Case studies-

1.9.1 Case studies of -Wada

1.9.1.1 Deshmukh wada-

- **Orientation** – this Wada is north-south orientated, which is ideal orientation in point of view of blocking solar radiation.
- **Open space**-there is no courtyard as open space but outside there is a lot of space around the Wada.
- **Semi--open spaces-** balconies , verandah , porches can be used advantageously for day time activties as well as give protection from rainfall
- **Wall**-all four walls are exposed to sun as there is no other structures connected to it.the walls are built from rectangular stones, bricks. The thickness of wall is 400 mm.
- **Roof**-Mangalore tiles are used for roof and it is a sloped roof, hip roof. A.c. sheets are also used for porch.
- **Shading device**-the projections of balcony & windows on walls are the shading device. Plants & trees around the wada act as shading device.
- **Ventilation & light-** windows of sizes 1.2x 0.9 m are provided they are shaded by external overhangs. Sufficient light comes in and cross ventilation done by this openings.
- **Landform**-almost flat site with small slope from n-s direction.
- **Materials-** stones, wood.

Fig 3: front view of wada

Fig 4: from living room

1.9.1.2 Joglekar wada -

- **Orientation**-north south to east west oriented.
- **Built form-** the plan of wada is rectangular in shape, giving 2 walls exposed. Plinth is 300 mm.
- **Zoning-** entry is through otta which is not covered by any projections. There is central court around it all rooms are situated. There is a staircase near to entrance to first floor.
- **Open space**-there is a open to sky courtyard at center. At front & at back there is a verandah, which is used for sit outs.
- **Walls-** for foundation dress stone masonry from plinth 300 mm rubble (undressed) masonry stones are used & then brick work is done at first floor front facades having wooden facades with windows. This wooden windows at the central part of first floor, remaining walls are brick worked.
- **Roof**-sloped roof with Mangalore tiles. Projected to work as chajja for windows & walls to protect from heavy rain & sunrays.
- **Shading device**-roof projections.
- **Ventilation / light**-sufficient light & air is provided inside as open courtyard is present at ground floor. There are two windows of door size present. At f. Floor there are also many windows to the front facades so cross ventilation work done perfectly.
- **Landform** – flat land.
- **Materials**-cement , stones (dressed , undressed) , bricks , wood (door , windows , frames , beams , columns , rafters. Etc.

Fig 5: Front view of wada

Fig 6: right view of front facade

Fig 7: view of windows and wooden facade

1.9.1.3 Jogalekar wada-

Fig 8: front view of wada

- **Orientation-** the structure is oriented towards north-south.
- **Built form-** built form of structure is rectangular in shape. Plint is 600 mm.
- **Zoning-**entrance is through south face through semi covered space as otta from the road.
- **Open space-**no courtyard, only at front & at back, open space is available. Other two side walls are common between adjacent structures as row house.
- **Semi-open space-**front porch is used as sit outs, there is no Balconies on front side it create a barrier between house and sunrays from south.
- **Walls-**wall thickness is 400 mm. From foundation to plinth level stones are used & form plinth bricks are used for construction.
- **Roof-**Mangalore tiles used for roof. Sloped roof.
- **Shading device-** front façade, first floor is projected so, otta , entry doors, windows get shade & protection from sunrays. For first floor roof is projected (800-1000) mm to work as shading for windows.
- **Ventilation / light-**ventilation & light is only entered from front & back door, windows, no courtyard. At first floor front facades is constructed by large windows, sufficient light & air comes inside & from back windows, door cross ventilation occurs.
- **Landform** –little sloped land.
- **Materials-**stone, bricks, wood. Wood is used for door, windows, columns, beam, and some decorative parts. At first floor, front façade is totally constructed by wooden windows.

Fig 9: backyard view

Fig 10: view of otta

Fig 11: view of front façade

1.9.2 Case studies of - old houses

1.9.2.1 Surekha Niwas-

- **Orientation-**north south oriented.
- **Built form-** the plan of house is rectangular in Shape, giving 3 walls exposed. Plinth is 450 mm.

Fig 11: front view of house

- **Zoning-** entry is from west with small otta .there is a staircase between living hall & kitchen to first floor. There is a utility area after kitchen & then backyard.
- **Open space-**there is a big open space at front side & at back of the structure. For parking.
- **Walls-** for foundation dress stone masonry up to plinth 450 mm are used & then brick work is done at first floor front facades having wooden facades with windows. This wooden windows at the central part of first floor, remaining walls

Fig 12: view of wall

- **Roof-**sloped roof with Mangalore tiles. Projected to work as chajja for windows & walls to protect from heavy rain & sunrays.
- **Shading device-**roof projections.
- **Ventilation / light-**sufficient light & air is provided inside as small windows at ground floor. There are many windows to the front facades and back wall so cross ventilation work done perfectly.
- **Landform** – flat land.
- **Materials-**cement, stone, wood, bricks. Stone used in large quantity.

Fig 13: stone steps.

Fig 14: wooden ceiling.

1.9.2.2 Shinde Niwas-

- **Orientation-**east- west oriented.
- **Built form-** the plan of house is rectangular in shape, giving 4 walls exposed. Plinth is 150 mm.
- **Zoning-** entry is through a wooden door which is covered by 600 mm roof projections .it is a small structure of single room having small windows at front & back walls.
- **Open space-**there is an open space at front & at back there is a verandah, which is used for sit outs.
- **Walls-** for foundation dress stone masonry is used.
- **Roof-**sloped roof with Mangalore tiles. Projected to work as chajja for windows & walls to protect from heavy rain & sunrays.
- **Shading device-**roof projections & small chajja.
- **Ventilation** / light-sufficient light & air is provided inside from door & windows.
- **Landform** – flat land.
- **Materials-**cement , stones (dressed) , bricks , wood (door , windows , frames , beams , columns , rafters.

Fig 15: view of house

1.10 Observations , findings , inferences –

1.9.1 Wada

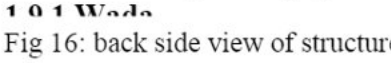


Fig 16: back side view of structure

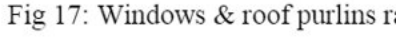


Fig 17: Windows & roof purlins rafters

Sr.no	1.8.1.1	1.8.1.2	1.8.1.3
Wada	Deshmukh wada	Jogalekar wada	Joglekar wada
Orientation	N-s oriented	N-s oriented	N-s oriented
Built form	Rectangular	Rectangular	Rectangular
Wall	400mm. all sides exposed to sun. stone used	400 mm. from foundation to plinth –stones used. & From plinth bricks used for construction	300 mm. For foundation dress stone masonry, from plinth rubble masonary stone used. Then brick work done.
Roof	Mangalore tiles, A.c sheets. Sloped roof	Sloped roof, Mangalore tiles.	Sloped roof with Mangalore tiles ,
Materials	Dress stone masonary, wood , bricks	Stone, bricks, wood. At F.F. Façade is totally constructed in wood.	Cement, stone (dressed, undressed) , bricks , wood , etc.
Open space	No courtyard , open space is around the structure	Open space is available at front & at back, no courtyard.	Central open to sky courtyard. At front & at back there is a verandah
Ventilation & light	Sufficient light comes from doors balconies , big windows , otta , cross ventilation done	At f.F. Sufficient light comes from front facade windows , also cross ventilation occurs	Sufficient light & air comes inside from court , big windows & at f.f there is a front façade which is made up from wooden windows

1.9.2. Old houses-

Sr.no	**1.8.2.1**	**1.8.2.2**
Old houses	Surekha Niwas	Shinde Niwas
Orientation	N-s oriented	E-w oriented
Built form	Rectangular. G+1 structure , flat land	Rectangular. Ground floor structure. Plinth level is 150 mm , it is a small structure
Wall	600mm. Foundation- dress stone masonary , then brick work At f.f. brick work is done , having wooden facades windows for light & ventilation plinth level 450 mm	450 mm thick stone walls. Dress stone masonary is used.
Roof	Sloped roof , Mangalore tiles	Sloped roof , Mangalore tiles used

Materials	Cement , stone , wood , bricks , stone used in large scale	Stone, bricks, wood, etc.
Open space	No courtyard ,big open space at front & at back of structure	Open space at front & back side
Ventilation & light	Sufficient light & air come inside at ground floor through small windows. At f.f. windows At front facades and big windows at back wall form cross ventilation.	Sufficient light & air comes inside from small windows & doors.

1.11 Inference and findings -

- From case studies and matrix it is observed that most of the structures are north -South oriented, with rectangular plans.
- Having sloped roof due to heavy rainfall with Mangalore tiles.
- Stones are used for constructions, front facades made with big wooden windows for light and ventilation.

2 Understanding the context-

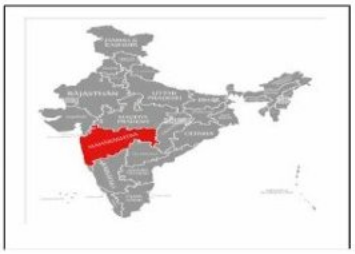


Fig 18: map of India highlighting Maharashtra

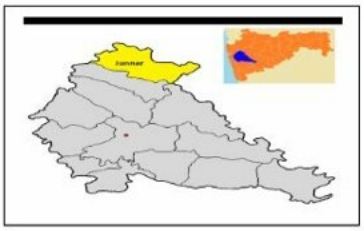


Fig 19: map of Maharashtra highlighting Junnar.

Fig 18: map of Junnar

- Villages- 183
- Population –36,567 (2011)
- Language- Marathi

2.1 historical background-

Junnar is an ancient village and therefore there are so many old structures such as Wada, forts, two floor houses, and ground floor houses, with their original characteristics of Maratha architecture. Junnar has heritage places and historical background, as it has 2000years old prosperous history as Junnar was sub capital of Satvahana dynasty. There is the birthplace of Chhatrapati Shivaji Maharaja, Shivneri fort, and other six forts. So many ancient temples, caves, wada etc.

2.2 geography-

Junnar is located in the northern part of pune district. Latitude is 19^0 .00' to 19^0 .24' north and longitude is 73^0 .40' to 74^0 .18' east. Geographical area of Junnar s 1579.84 sq. in Junnar there are 183 villages and one urban area. Western part has irregular geography. Harishchandragarh is located at north-western corner, a highest point (1422 m) and lowest point (600m) is located at south-east corner. Kukadi and Meena are the main rivers in this zone. There are five dams as irrigation projects like pimpalgavjoga dam, Manikdoh, Yedgaon, Vadaj reservior, they provide irrigation facility to the Junnar.

2.3 Climate-

Junnar come in the zone of hilly isohytal slope. It has rainfall in between 50 to 250 cm. climate of Junnar is warm and humid. Over course of the year, temperature typically varies from 53^0F to 96^0 F and is rarely blow 47^0 F or above 100^0 F. wet season is warm, harsh, windy, and cloudy and the dry season is hot and mostly clear.

2.9 Social, Economic, Cultural Factors-

Junnar is one of the tourist attraction in Maharashtra, as it has historical significance, there are so many waterfalls observed in rainy season. Daryghat, Naneghat are tourist spot of them, there are ancient temples like Kukadeshwar and holy places as Ozer, Lenyadry, kaprdikeshwar temple at Otur, bull Samadhi at Ale. Number of cave groups as Amba-Ambika cave, Bhutleni, Shivneri caves, Lenyadry caves, manmodi caves, and Tulja caves are neighborhood to this area, hence tourism is one of the source of economy in Junnar. Sugar factory, Shri Vighnahar Sahakari Sakhar Karkhana, is located here and therefore it promote to sugarcane farming. Agriculture is the main occupation of the residents.

Junnar is also known for its cultural activities like narayangaon is famous for Tamasha fad, Tamasha is a traditional folk dance of Maharashtra.

3 Introduction to warm and humid climate-

Characteristics of this climate are high humidity, strong sun, glare from the sky and horizon, there is the long monsoon period with heavy rainfall. Solar radiations in such a area, Due to vapors in air and cloud cover defused radiations reach to earth surface and intense radiation on clear day.

4. Settlement pattern of Junnar –

Similar to other villages Junnar also start develop around the river ''Kukadi', from ancient time. There are two rivers Kukadi and Meena around this research area. Two National highway pass are passing through it NH-50 (Pune – Nasik) running north-south n eastern part of Junnar.NH-222 (Ahmednagar- Kalyan) runs east –west in Northern part of Junnar. Due to huge forest and rough topography west part of it shows low density of roads.
Mostly houses observed rectangular in plan and sloping roof with covering of Mangalore tiles as suitable to climate. Structures are situated on both sides of roads, secondary roads. With width of houses parallel to road length. Due to radiation of sunrays mostly structures having one common wall, hence in summer shadows of adjoining structures are helpful in cooling of roads, otta, and courtyards. Most of the structures are north-south oriented very few structures

oriented according to area available for construction. Green plants seen at least two sides of structures in front and backyards.

Kukadi river flows in North side of research area, where agricultural land is present and barren land present on south-west side of Junnar village.

Settlement pattern of research area is a combination of linear pattern and cross shape pattern as houses present.

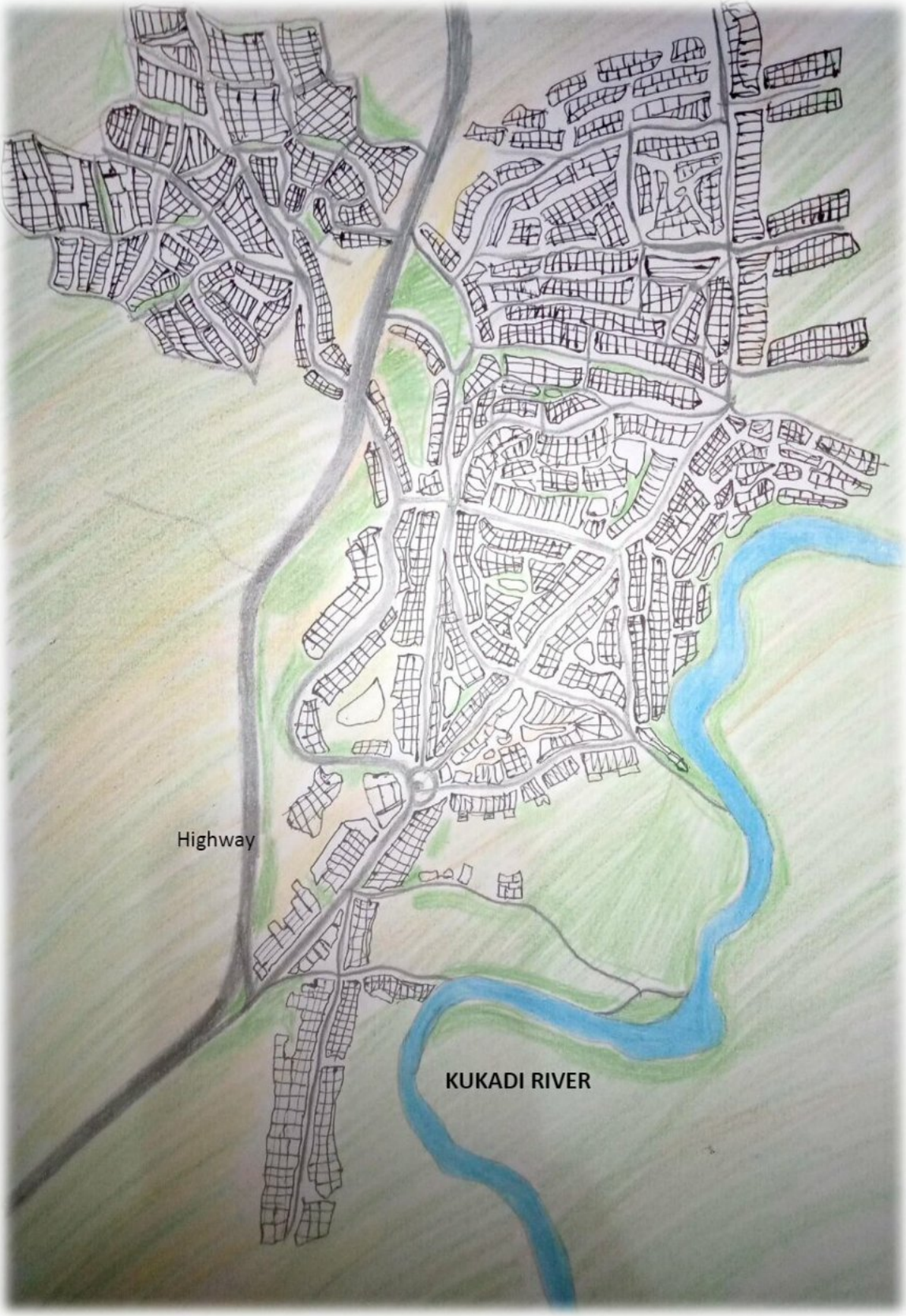
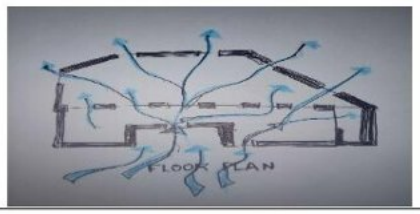
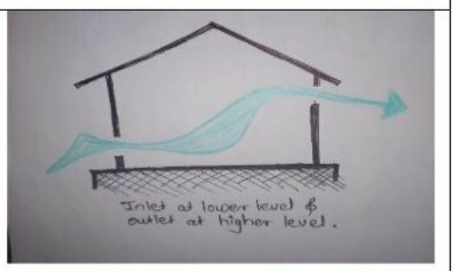


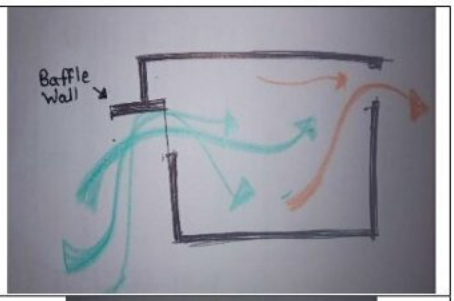
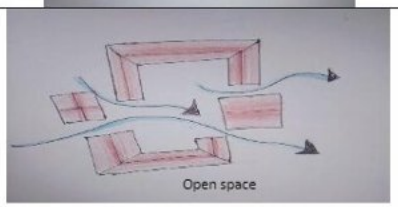
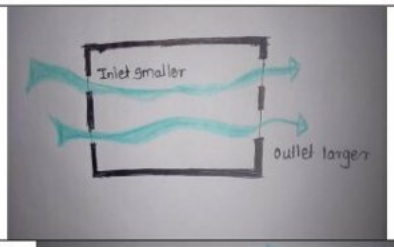
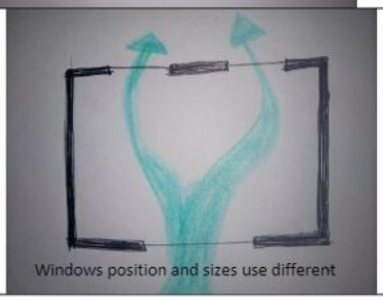
Fig 21: settlement pattern map research area Junnar)

5. Introduction to building problems in warm & humid climate-

The problems faced by some inhabitants find out during live case studies are mostly old structures walls are plaster with mud, and its need to be regularly redecorate with same materials. Due to mud used if there is no proper waterproofing done, water come inside by capillary action. In this area winds with dust particles flows in winter , structures having Mangalore tiles with sloping roof most of time this dust enter through the open spaces like courtyard and from below the Mangalore tiles where small gaps present between battens and tiles.

6. Techniques for controlling temperature, sunlight, heavy rainfall in Junnar-

	Techniques	Conceptual Sketches
Temperature control	• Temperature is controlled by various methods by using various materials for wall roof, openings , etc.	
Orientation and street width	• N-S orientation is ideal for blocking solar radiation. • In summer to avoid solar heat during late morning and early afternoon road width should be appropriate.	
Built form	• Mostly square and rectangular plans are best, the structure should be long and narrow to allow cross ventilation.	
Building covers	• Due to heavy rainfall sloping roof is best to remove water from roof surface. • Mangalore tiles are the traditional element as it help to resist heat and also keep structure cool during summer. Vents at roof used to induce ventilation and remove out rising hot air. • Broken tiles can be used for roof to reflect harsh rays from sun.	
Walls	• The walls should designed to promote air flow so as to counter the prevalent humidity. • Baffle walls, both inside and outside can help to divert the flow of wind inside.	

	• They should be protected from the heavy rainfall prevalent in such areas. • Careful water proofing and drainage of water is necessary in design due to heavy rain.	
Shading devices	• Shading devices are very essential in such areas, due to heavy rainfall and harsh sunlight's. • Chajja and roof projections and plants near to wall.	
Open space (courtyard, otta)	• • Courtyards play important role in rising hot air away. • If possible structure should be spread out over the site to create open space between to promote free air movement.	
Surrounding landscape	• • Various types of plants used which are capable to protect structure from heavy rainfall, sun glare, and heat. • Though temperature is not very high free plants are applicable for shading. • Water-bodies are not essential because they increase humidity.	
Openings (window, door)	○ • Openings like door, windows, vents should be covered by overhangs like chajja. • Outlets at higher level serve to draw out hot air.	
Ventilation	• Cross ventilation plays important role in warm and humid climate. • All door, windows should kept open for maximum ventilation. • Various sizes of openings are used like inlets are small as compared to outlets.	

6.1 To resist heat gain-

Mostly used materials which reflect the heat, concrete and bricks in which bricks are observed in old constructions. The materials which take long time to heat up are good for such a climate. Shading of building is necessary.

6.2 To promote heat loss-

Devices used to promote heat loss like windows, courtyards, are well ventilated and try to reduce humidity level as possible. Sufficient ventilation required throughout the day.

7. Conclusion-

1. During case studies and after study find out the solutions of modern problems faced by inhabitants because most of the structures were 80 to 100 years old.
2. Finding out the renovation techniques which are suitable for them.
3. In order to build suitable structure in present and in future according to surrounding factors.

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ROLE OF OPENINGS IN DIFFERENT CLIMATIC ZONES IN THE VIEW OF SUSTAINABILITY

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Abstract: Openings such as windows allow natural light and ventilation into the structure. Doors are designed to provide entry and exit in the building. The openings play a vital role in thermally insulating the structure and they connect the building and the environment. The aim of the research is to study the role of the openings in different climatic zones to make the building sustainable. The objectives include to study sustainable Architecture Principles, to collect information about the planning strategies in climatic zones, to study case studies of different climatic zones. The case studies are based on the following parameters that is location, orientation, size, number of openings, material, height of the openings in different climatic zones. According to the climatic zones the ratios and proportions vary. Research is useful to the architects, students, and designers which will give a great approach to design the opening in the sustainable point of view in the different climatic zones.

Keywords: Sustainable Architecture, Sustainable Architecture Principles, Climatic Zones

1.Introduction :

Openings play a very important role in different climatic zones and for people living in these climatic zones to save energy into the structure in the form of natural ventilation into the structure considering sustainability. Interests in the sustainability and climate and comfort of the humans into the structure.

Literature-1 The basic principles of sustainable Architecture The sustainable Architecture is Creating and responsibly sustaining healthy environment, responding to ecological need, making optimal use of energy without overexploitation of natural resources.

Literature-2: Understanding Climate for Sustainable Building Design –A Case Study in Warm Humid Region in India. Understanding climate for energy efficiency or sustainable architecture. The paper identifies options of integrated climatic considerations as an integral part of planning and building design taking the case study of Tiruchirappalli, India.

Literature-3 Investigating Sustainability in hot and dry climate- courtyard houses in Iran. Parameters of central courtyard houses such as orientation, scale, proportion, courtyard components, and material were compared.

All of them focused on design principles of the building as a whole and not the openings particularly in their research. It is important to the designers to know the role of the openings in the building in the climatic zones of India so that they implement it into their design and which will save the energy into the building.

2.Aim: To study the role of openings in different climatic zones to make the building sustainable.

3.Objectives:

1. To study sustainable Architecture Principles.
2. To collect information about the planning strategies in climatic zones in India.
3. To study different climatic zones case study and analyze it.

4.Need of the Topic

- The researchers had not thought about the materials, the sizes, the orientation of the opening in the particular climatic zones of India considering sustainability.
- They studied on the how the shading devices can be done in particular climate but not on the heights of the orientation and sizes of the openings according to sustainability.
- Research is useful to the architects which will give a great approach to them in the sustainable point of view to design the opening in the different climatic zones of India

5.Scope:

- The purpose of the research is to identify the openings in different climatic zones of India considering sustainability.
- Studying on the 5 climatic zones of the India in 5 different cities of India.
- The location, orientation, size, material, height of the openings in 5 climatic zones of India.

6.Limitations:

- It deals with the study of a single building in a city not all the cities or states under the particular climatic zones.
- It deals with the old structure in the particular climatic zones.
- Research deals with only two components of sustainable architecture that is energy saving into the structure, thermal comfort into the structure and climate responsive openings.

7.Methodology:

- Studying structures of Hot and dry climate, Hot and humid climate, Composite Climate, Temperate Climate, Cold climate
- Case study of structure in each climate
- Analysis of case studies

Wherever possible try to ensure that the size of the text in your figures (apart from superscripts/subscripts) is approximately the same size as the main text (12 points).

Sr. No	Parameters of Openings	Climate Zones of India				
		Hot and dry Jaisalmer, Rajasthan	**Hot and humid** Thuckalay Tamil Nādu	**Composite** Gual Pahari Gurgaon ,Delhi	**Temperate** Bangalore Karnataka	**Cold** Leh, Himachal Pradesh
1	**Introduction**	This Haveli was commissioned to serve as the residence of Diwan Mohata Nathmal, the PM of Jaisalmer. Its Architecture and miniature is very famous	Padmanabhapuram is a town and was the erstwhile capital of the kingdom of Travancore, ruled by the king Rama Verma and the palace antiques, Armory, wood work is very famous	The building is a one among the 3 building complexes and is residential block	It is a research institute that specializes in the fields of energy, environment and sustainable development.	The house was built for Babu Dorje and his family. Mr. Dorje was the engineer behind the construction of the airport of Leh in 1948
2	**Structure Name**	Nathmalji-ki-haveli. Year-1885A.D. Architects-Hathi and lulu 	Padmanabhapuram palace. Year-1601 C. E 	Guest House of Solar energy center. Year-1988 	Energy research Institute Year-2001 	Dorje House Year-Early 1900's 
3	**Orientation of opening**	East-west	North-south	North-west	North-east	South
4	**Sizes of openings**	Inlet-large Outlet-small	Large -lower level, small at higher level	Large arch window	Normal size opening	Small openings
5	**Heights of opening**	Low door height More sill heights	0.6m max sill level	Normal 2.1m-doors and no sill to external windows.	sill 0.9m from floor 2.1m-doors	sill 0.9m from floor 2.1m-doors
6	**Number of openings**	Window-75 Door-40 Courtyard-2	Window-300 Door-125 Courtyard-6	Window-25 Door-20	Window-20 Door-30	Window-8 Door-10

7	**Types of opening**	Jali Window, Doors, Courtyards	Windows Doors Courtyards	Large Windows, Doors	Windows doors	Windows Doors
8	**Plans of the structures**					
9	**Material of opening**	Yellow sand stone	Hard wood panel with colored mica	Aluminum panel	Aluminum panel	Wooden panel
10	**Inference**	The traditional architecture has the sustainable architecture principles dwelled into it. The courtyard is the main element seen. The Nath-mal-li-ka-mahal in Jaisalmer is energy efficient. The Number of openings are more at the short side of the structure. The sizes and the heights differ according to the climatic factor to achieve thermal comfort into the structure. Ratio-1:0.20	The Padmanabhapuram palace in Tamil Nādu saves energy into the structure as it has proper openings according to the climatic conditions. The traditional architecture has the sustainable architecture principles dwelled into it. The courtyard is the main element seen.. The sizes and the heights differ according to the climatic factor to achieve thermal comfort into the structure. Ratio-1:0.20	The Guest house in Delhi has large openings windows which circulate air into structure and is energy saving building with maintaining thermal comfort. The sizes and the heights differ according to the climatic factor to achieve thermal comfort into the structure. Ratio-1:0.17	The energy research institute (TERI) is a sustainable building which saves energy and the openings are in n-e direction and ventilation by solar chimneys. Ratio-1:0.18	The Dorje house has small openings from south street and the warmth in the structure is maintained as it is traditionally constructed house and the openings into the structure circulate adequate air into the structure and achieves thermal comfort into the structure. The materials are very keenly used according the climatic condition. The sizes and the heights differ according to the climatic factor to achieve thermal comfort into the structure. Ratio-1:0.1

9.Conclusion:

- The openings play a very important role in thermally comforting the structure. The traditional architecture has the sustainable architecture principles dwelled into it.
- The courtyard is the main element seen in most of the structures of the different climate zones of India.
- It is Investigated that the openings are orientated in such a way that it saves the energy into the structure and also increase thermal capacity into the structure which is one of the sustainability principles.
- The ratio and proportions vary according to the climatic conditions.
- The materials are very keenly used according the climatic condition.
- The sizes and the heights differ according to the climatic factor to achieve thermal comfort into the structure.

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The Impact Of Lockdown On The Movement Of Disabled People In Rural Region- Akole Taluka

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Abstract: The study aims to analyze the effects of lockdown on physically challenged people for accessing public-built structures and the study is particularly in the Akole Taluka of A.Nagar district under Maharashtra to find the challenges for current architectural practice in the ground reality of that rural region. The objectives of the study are to investigate the various types of public-built structures that were open in lockdown as emergency services, analyze them, identify which were physically accessible for disabled people, identify which architectural elements are required within the built spaces based on their disability consideration factor, and analyze how barrier-free accessible built environment play's a major role in an individual's life. The methodology of this research is conducted through primary data is collected through a live case study, observations, and secondary data is collected through literature review. The study does not include mental, intellectual, multiple disability information and does not include data rather than emergency services that were opened in lockdown. The study concluded that the emergency services were not physically accessible to everyone in the first wave of lockdown, that lockdown had affected physically challenged people on their physical as well as mental health, and they face lots of challenges regarding accessibility, it causes that they are lagging behind and struggling due to a lack of access to services. This research is helping to implement architecture elements in design and to be useful for physically challenged people, for disability law enforcement officers, for strengthening PWD's law, architects, decision-makers, and local people who do not think about a universal approach.

Key Words: Covid-19, Accessibility, Barriers, Physically disabled, Rural Context.

Introduction: At the moment of a Covid pandemic physically challenged people are face difficulty related to accessing the services, which causes their discomfort, inconvenience and it is affecting their physical as well as mental health. In lockdown situations, all individuals were faced a lot of difficulties related to their daily activities, but the people most affected were disabled. Vaccination is the need of every individual in this situation and it is the right of every individual to get vaccinated. But the question arises can every person get a vaccine without struggling to get in? This question is motivated to find out the truth. India went into a lockdown on March 25, 2020, to combat the spread of COVID 19 infections and reduce the pressure on healthcare systems. Lockdown was required in those circumstances, but it affected every individual's life very badly. The people with disabilities in that situation were facing several types of difficulties, the most important was related to the accessibility of built spaces. It was not only the lockdown that caused them to face access-related issues but otherwise, also they have the same problems for accessing the services that they always need to rely on others. But because of the rule that we called social distancing people are not ready to come across and help them. This situation helps us to realize that these people needed architectural building elements within the built spaces. This research will help to implement architecture elements in design and help to make strengthen the law of enforcement.

Aim: To analyze the effects of lockdown on physically challenged people for accessing public-built structures.

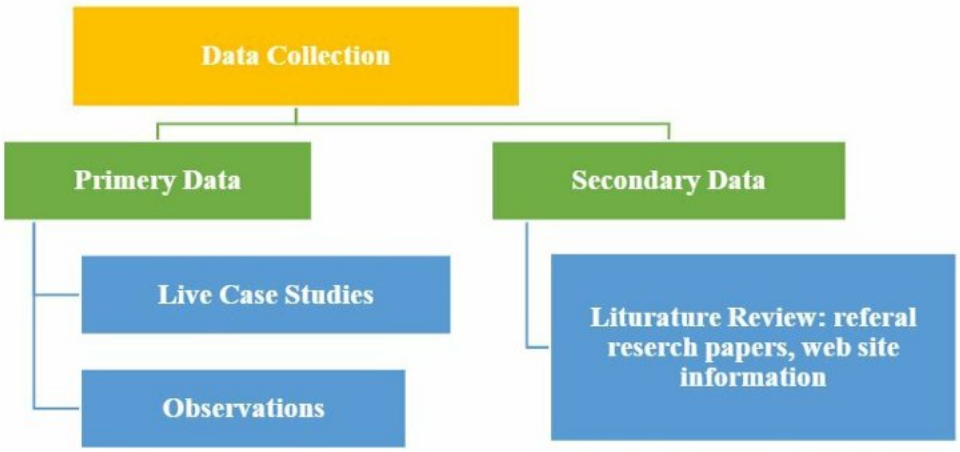
Objectives:

1. To investigate the various types of public-built structures that were open in lockdown as emergency services.
2. To analyze them and identify which were physically accessible for disabled people.
3. To identify which architectural elements are required within the built spaces based on their disability consideration factor.
4. To analyze how barrier-free accessible built environment play's a major role in an individual's life.

Scope: The purpose of the study is to analyze the public-built spaces that were built to consider the disabled keep in the mind. Sample for studying are public-built spaces that were open in lockdown as emergency services such as primary hospitals, vaccination centers, covid centers, banks, grocery stores. This topic includes information about Architectural built elements that are required for physically challenged people. The study is particularly in the Akole Taluka of A.Nagar district under Maharashtra.

Limitations: The study will not include information about mental, intellectual, multiple disabilities. not included data rather than emergency services that were open in lockdown.

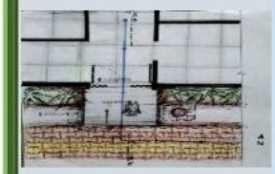
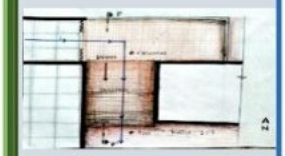
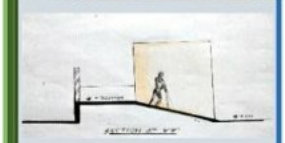
Methodology:

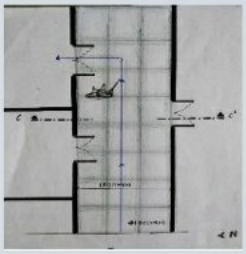
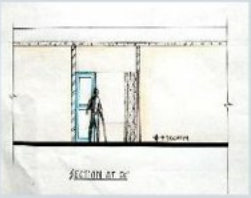


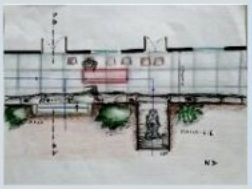
Need Of The Topic: Previously researchers had not thought about all emergency services opened up in lockdown and did not include data on all physically challenged people. That's why data does not include information on physically challenged people struggling for access. This research is useful for physically challenged people, for disability law enforcement officers, for strengthening PWD's law, architects, decision-makers, and local people who do not think about a universal approach.

Matrix:

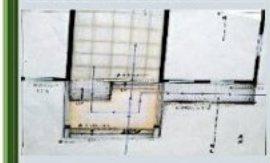
Building Typology	Vaccination Center	

Name	Rural Hospital Akole			
Location	Rural Hospital Akole, Tal. Akole, Dist. Ahmednagar			
Architectural Building Elements	**Description**	**Photograph**	**Remark**	**Inference**
Entrance And Exit    	• 2 ramps are provided one is for entry and the another is for the exit. • There are no handrails. • Steps are not provided for entry or exit.	 	The exit ramp is not in proper ratio because of that there is a difficulty for a wheelchair user to run a wheelchair through a ramp and railings are not given it causes difficulty for visually impaired people.	Many architectural elements are missing in the structure and lack of access through the elements is why physically challenged people face a lot of challenges for accessing the vaccination center. There is a need for stairs and railings which are a very primary need to access services. There is a need for a toilet that is accessible to everyone and the door should be like this that is not be opened in the corridor. There is a need to provide guide floor material, textual signals, and migration chairs. For exit ramp the ratio used is 1:7 there is a need to provide a 1:12 ratio ramp.
Flooring	• Non-Slip resistant materials are used for flooring		A physically challenged person can easily get access with their mobility equipment.	
Exterior	• Some trees are planted on the periphery of the building block and some of them are planted in front of the building block to create shade for the outdoor seating.		There is an outdoor seating area below the tree and the exterior area is accessible for physically disabled people.	
Pathway	• Worm brick concrete floor blocks are used.		The pathway is accessible and barrier-free for physically challenged people.	

Toilet	• The universal toilet is not there.		There is a provision of the toilet but it is not accessible for physically challenged people.	
Light Ventilation	• Large windows are provided for lighting and ventilation purpose.		Light and ventilation are good and enough.	
Corridor  	• The corridor is large or unobstructed with a seating area. • The width of the entry and exit corridor is 1800 mm. • The corridors are a width of 2500 mm which leads towards the online registration for vaccines.	 	The corridor is large and unobstructed enough space for the circulation of mobility devices. But the door in the corridor which leads toward the vaccination area opens outward in the corridor creates an obstruction for the mobility devices.	
Guide Floor	• No guide floor material is provided.		Guiding floor material is not there to guide visually impaired people.	
Door	• Doors are open from outside in the corridor, which leads towards the vaccination area.		The main door is accessible for mobility devices but the door in the corridor which opens outward in the corridor creates an obstruction for the mobility devices.	
Textural Indication	• There is no kind of textural indication.		Visually impaired people suffer because there is no textural indication.	
Evacuation	• There is no provision for an Evacuation chair.		There is no evacuation chair for mobility-impaired people, if any emergency happened then they might be face difficulty.	
Building Typology	Vaccination Center			
Name	Jilha Parishad Prathmik Kendra Shala Akole Mule.			

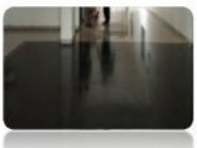
Location	Jilha Parishad Prathmik Kendra Shala Akole Mule, Tal-Akole, Dis-A.Nagar, Maharashtra 422601.			
Architectural Building Elements	**Description**	**Photograph**	**Remark**	**Inference**
Entrance And Exit  	• A huge gate is provided for the entrance. • Steps and ramp are provided but they aren't in good condition. • The railings are not proper in condition.		There is no good flooring to access through that gate with mobility equipment. Steps are provided without railings that are completely damaged, the ramp has also been damaged and not in proper ratio. The railing is not in the right condition and all these things cannot be used by physically challenged people.	There are missing architectural elements, damaged flooring, and lack of access by the elements which is why physically challenged people struggle for access. There is a need for good flooring. There is a ramp with a 1:6 ratio so there is a need to provide a 1:12 ratio ramp and railing which is a primary need to get access to any building. Proper pathways, the accessible door, should be accessible toilet which is accessible for everyone. Need to provide guide floor material, textual indication, and evacuation chair.
Flooring	• Shahabad tile is used for flooring. • For circulation, there is damaged flooring.		The flooring is completely damaged which causes difficulty for physically challenged people.	
Exterior	• There are large trees within the periphery of the building block.		There is an outdoor seating area below the tree but the outer area is not accessible for mobility equipment due to the floor.	
Pathway	• Mud floor is used for pathways.		Disabled people face difficulty because there is no flat surface.	
Toilet	• The universal toilet is not there.		There is a provision of the toilet but it is not accessible for physically challenged people.	
Light Ventilation	• Windows and doors are provided for natural ventilation.		There are enough windows for natural ventilation.	

Corridor	• The flooring of the corridor is damaged.		The flooring is completely damaged which makes it difficult for physically challenged people to enter the corridor.	
Guide Floor	• No guide floor material is provided.		Guiding floor material is not there to guide visually impaired people.	
Door	• A double wooden door is provided.		The width of the door is not wheelchair accessible so people with disabilities face difficulties.	
Textural Indication	• There is no textural indication.		Visually impaired people suffer because there is no textural indication.	
Evacuation	• There is no provision for an Evacuation chair.		There is no evacuation chair for mobility-impaired people, if any emergency happened then they might be face difficulty.	
Building Typology	Vaccination Center			
Name	Zilla Parishad Ahmednagar Primary Health Sub-Center Nawalewadi, Tal. Akole, Dis. A. Nagara			
Location	Vittal nagar nawalewadi Tal. Akole, Dist. Ahmednagar, Maharashtra 422601.			
Architectural Building Elements	**Description**	**Photograph**	**Remark**	**Inference**

Entrance And    	• For the main entrance, a huge metal gate is provided. • Separate gate is provided for main entry and exit. • A ramp and staircase are provided for the building entrance.	    	The ramps are not in proper ratio because of that there is a difficulty for a wheelchair user to run a wheelchair through a ramp and railings are not given extra rail causing difficulty to visually impaired users.	Some architectural elements are there but not in the proper ratio, some architectural elements are missing, and randomly grown grass all create a barrier for physically challenged people. Here they used 1:6 and 1:3 ratio ramp but There is a need for a ramp in a proper ratio which is 1:12. The ramp has railings on both sides with an extended railing that is 0.30 meters across the top and bottom of the ramp, and there is a need for landing space. Need of non-slippery tiles and exterior pathway without obstacles and accessible floor material. Need to provide an accessible toilet and evacuation chair, guide floor material in the corridor, and Textual indication.
Flooring	• Ceramic floor tile (glossy finish) is used.		The floor is slippery which makes it difficult to use mobility equipment.	
Exterior	• Large open space in front of vaccination center. • A huge compound wall is used to create a visual barrier. • Some linearly planted flowering plant is there on the right side of the building block. • There are no huge trees in the periphery of the building block.	  	The exterior area is accessible for physically challenged people but the exterior area which leads towards the exit gate there is messy grown grass which creates an obstruction for physically challenged people.	

Pathway	• Worm brick concrete floor blocks are used for the exterior floor. • There is messy grown grass on the pathway which leads towards the exit gate.	 	The pathway is accessible and barrier-free for physically challenged people. But the pathway which leads towards the exit gate there is messy grown grass which creates an obstruction for physically challenged people.	
Toilet	• The universal toilet is not there.		There is a provision of the toilet but it is not accessible for physically challenged people.	
Light Ventilation	• Windows and doors are provided for natural ventilation.		There are enough windows for natural ventilation.	
Corridor	• The corridor is large or unobstructed.		The corridor is large and unobstructed enough space for the circulation of mobility devices.	
Guide Floor	• No guide floor material is provided.		Guiding floor material is not there to guide visually impaired people.	
Door	• A metal sliding door is provided for the entrance. • And other doors are wooden single doors.		There is not enough landing space in front of the door so it is difficult for disabled people to get in through the door.	
Textural Indication	• There is no textural indication.		Visually impaired people suffer because there is no textural indication.	
Evacuation	• There is no provision for an Evacuation chair.		There is no evacuation chair for mobility-impaired people, if any emergency happened then they might be face difficulty.	

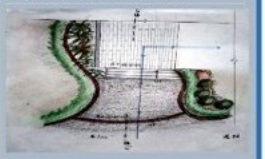
Building Typology	Covid Center	
Name	Prathmik Arogya Kendra Sugaon Khurd, Tal-Akole, Dis-A.Nagar.	
Location	Sugaon Khurd, Tal-	

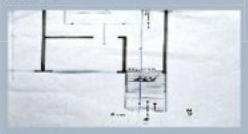
	Akole, Dis-A.Nagar, Maharashtra 422601.			
Architectural Building Elements	**Description**	**Photograph**	**Remark**	**Inference**
Entrance And Exit  	• There are stairs and ramps for entry and exit.		The ramps are not in proper ratio because of that there is a difficulty for a wheelchair user to run a wheelchair through a ramp and for railings extra rail are not given it causes difficulty to visually impaired users.	Some architectural elements are there but not in the right ratio and some architectural elements are absent which is why disabled people face a lot of challenges to entering the Covid center. Here is a ramp with a 1:5 and 1:4 ratio but needs to provide a ramp with a 1:12 ratio with handrails and extra rail on top and bottom and with an extended railing that is 0.30 meters across the top and bottom of the ramp. Need to provide non-slippery tiles an accessible toilet and guide floor material, an evacuation chair, textual indication. There is a need to remove obstructions in the entrance which is created because of the floor mat.
Flooring	• Ceramic floor tile (glossy finish) is used.		The floor is slippery which makes it difficult to use mobility equipment.	
Exterior	• There is only one tree is on the site. • There is a large open space in front of the covid center which acts as a parking space.		The Exterior area is accessible for physically challenged people.	
Pathway	• Worm brick Concrete floor block is used.		The pathway is accessible and barrier-free for physically challenged people.	
Toilet	• The universal toilet is not there.		There is a provision of the toilet but it is not accessible for physically challenged people.	
Light Ventilation	• Doors and windows are used for natural ventilation. • Artificial light and ventilation are also used there.		Light and ventilation are good and enough.	

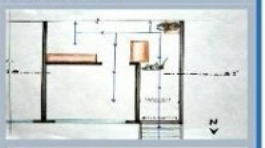
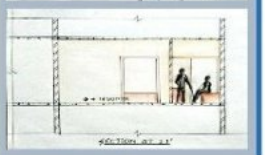
Corridor	• The corridor is large and unobstructed.		The corridor is large and unobstructed enough space for the circulation of mobility devices.	
Guide Floor	• No guide floor material is provided.		Guiding floor material is not there to guide visually impaired people.	
Door	• For entrance, there is a sliding metal gate and a wooden double door is provided.		The door is accessible for mobility equipment but there is a floor mat that creates an obstruction.	
Textural Indication	• There is no kind of textural indication.		Visually impaired people suffer because there is no textural indication.	
Evacuation	• There is no provision for an Evacuation chair.		There is no evacuation chair for mobility-impaired people, if any emergency happened then they might be face difficulty.	

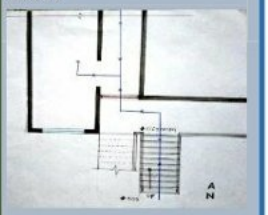
Building typology	Covid Center
Name	Vithal Lawns
Location	Akole Bypass Road, Vitthal Nagar, Tal-Akole, Dis-A.Nagar, Maharashtra 422601.

Architectural Building Elements	Description	Photograph	Remark	Inference

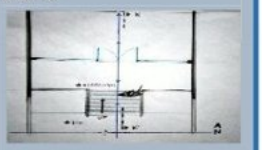
Entrance And  	• For the main entrance, there is a large sliding metal gate is provided. • There are stairs for entry and exit.	 	The entrance is not wheelchair accessible because there is no provision of a ramp, Railing is not there to support visually impaired people.	The structure has missing architectural elements and a lack of access through built space which is why physically challenged people are finding it difficult to enter the Covid center. There is a need to provide a ramp with proper ratio with handrails and extra rail on top and bottom and with an extended railing that is 0.30 meters across the top and bottom of the ramp. Need to provide non-slippery tiles for the interior flooring and paving blocks for exterior pathways. Need to provide an accessible toilet and guide floor material, an evacuation chair, textual indication. And proper windows must be provided.
Flooring	• Ceramic floor tile (glossy finish) is used.		The floor is slippery which makes it difficult to use mobility equipment.	
Exterior	• Large open spaces for parking and there are many trees on the exterior.	 	The exterior area has lavish greenery but there is a shallow slope no plain floor to operate mobility devices.	
Pathway	• Muram stone is laid on the surface of the soil. • There is a mud floor for the pathway.		Difficulty while operating a mobility device.	
Toilet	• The universal toilet is not there. • Toilet block is almost 6m away from the main building block.	 	There is a provision of the toilet but it is not accessible for physically challenged people and it is almost 6m away from the building block.	
Light Ventilation	• There are large openings without a window for natural ventilation. • Artificial light and ventilation are used there.		Without a window, that big opening increases the cold at night in that building block.	
Corridor	-		-	

Guide Floor	• No guide floor material is provided.		Guiding floor material is not there to guide visually impaired people.	
Door	• For entrance, a large sliding metal gate is provided. • And rolling shutter is provided for the toilet.		The gate is accessible for mobility equipment but the floor is not flat which causes difficulty for physically challenged people.	
Textural Indication	• There is no kind of textural indication.		Visually impaired people suffer because there is no textural indication.	
Evacuation	• There is no provision for an Evacuation chair.		There is no evacuation chair for mobility-impaired people, if any emergency happened then they might be face difficulty.	
Building typology	Healthcare			
Name	Shinde Hospital			
Location	Shinde Hospital, Akole, Maharashtra 422601, India.			
Architectural Building Elements	**Description**	**Photograph**	**Remark**	**Inference**
Entrance And Exit  	• Steps are provided. • There is no provision of a ramp.		The entrance is not wheelchair accessible because there is no provision of a ramp, And for railings, extra rail is not given it causing difficulty to visually impaired users.	There are obstructions for circulation of mobility devices, no access from the building elements, and absence of architectural elements in design which is why disabled people do not get access. There is a need to provide a ramp with proper ratio with handrails and extra rail on top and bottom and with an extended railing
Flooring	• Ceramic floor tile (glossy finish) is used.		The floor is slippery which makes it difficult to use mobility equipment.	

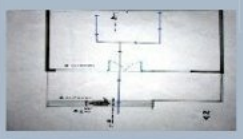
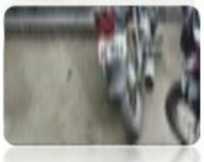
Exterior	• There is not enough space for parking and there is no kind of landscape.		There is no plain floor it causes wheelchair person face difficulty to get in.	that is 0.30 meters across the top and bottom of the ramp. It is necessary to provide non-slippery tiles for the interior flooring and paving blocks for the exterior pathway. The corridor should provide without obstacles. Accessible toilet and guide floor materials, an evacuation chair, textual signs must be provided.
Pathway	• There is a shallow slope on the pathway. • The ground soil floor is there.		People with disabilities face difficulties due to a lack of flat surfaces.	
Toilet	• Universal toilet is not there.		There is a provision of the toilet but it is not accessible for physically challenged people.	
Light Ventilation	• Doors and windows are used as natural ventilation. • And artificial light and ventilation are also used.	 	Light and ventilation are good and enough.	
Corridor  	• The seating desk and reception desk create obstruction in the corridor. • And footwear is also created obstruction.		There is a seating desk and the reception desk creates an obstruction for mobility device users.	
Guide Floor	• There is no guide floor material provided.		Guiding floor material is not there to guide visually impaired people.	
Door	• For entrance, a rolling shutter is provided. • Wooden and glass single door is also used there.	 	There is not enough landing space in front of the door so it is difficult for disabled people to get in through the door.	
Textural Indication	• There is no textual indication.		Visually impaired people suffer because there is no textural indication.	

Evacuation	• Evacuation chair is not there.		There is no evacuation chair for mobility-impaired people, if any emergency happened then they might be face difficulty.	
Building typology	Healthcare			
Name	Shree Saibaba Hospital			
Location	Shree Saibaba Hospital, Akole, Maharashtra 422601, India.			
Architectural Building Elements	**Description**	**Photograph**	**Remark**	**Inference**
Entrance And Exit 	• Steps are provided. • There is no provision of a ramp.		The entrance is not wheelchair accessible because there is no provision of a ramp, And for railings, extra rail is not given it causing difficulty to visually impaired users.	There is not enough circulation space for mobility equipment and the absence of architectural elements in design that's why people with disabilities are having difficulty accessing services. There is a need to provide a ramp with proper ratio with handrails and extra rail on top and bottom and with an extended railing that is 0.30 meters across the top and bottom of the ramp. It is necessary to provide non-slippery tiles for the interior flooring. The corridor should provide without obstacles it should be large. Accessible toilet and guide floor materials, an evacuation chair, textual
Flooring	• Ceramic floor tile (glossy finish) is used.		floor is slippery which makes it difficult to use mobility equipment.	
Exterior	• There is space for parking but there is no landscape.		Physically challenged people get access to the exterior areas without getting difficulties.	
Pathway	• Worm brick Concrete floor blocks are used.		Because of concrete floor blocks, there is no kind of issue to run mobility devices.	

Toilet	• Universal toilet is not there.		There is a provision of the toilet but it is not accessible for physically challenged people.	signs must be provided. Need to provide more windows for natural ventilation.
Light Ventilation	• There are very few windows for natural ventilation. • And artificial light and ventilation are used.		Because of the narrow area and minimum circulation space, there is the issue of natural light and ventilation.	
Corridor  	• There is not enough space for circulation. • The seating desk creates obstruction in the corridor.		Because of minimum circulation space and seating desk, there is no space to enter a mobility device.	
Guide Floor	• There is no guide floor material provided.		Guiding floor material is not there to guide visually impaired people.	
Door	• For entrance, a metal rolling shutter is provided.		The door is accessible for mobility equipment but there is a floor mat that creates an obstruction.	
Textural Indication	• There is no textual indication.		Visually impaired people suffer because there is no textural indication.	
Evacuation	• Evacuation chair is not there.		There is no evacuation chair for mobility-impaired people, if any emergency happened then they might be face difficulty.	
Building Typology	Grocery Shop			
Name	D K supper market akole			

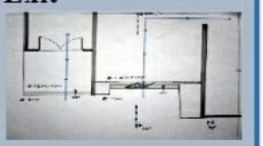
Location	D K Supper Market Akole, Maharashtra 422601, India			
Architectural Building Elements	**Description**	**Photograph**	**Remark**	**Inference**
Entrance And Exit  	• There are several steps to reach a height of 1050mm. • There is no provision for the ramp.		The entrance is not wheelchair accessible and the Railing is not proper for Visually impaired users.	There is an absence of architectural elements within the structure which causes inconvenience to disabled people for entering the service. There is a need to provide a ramp with proper ratio with handrails and extra rail on top and bottom and with an extended railing that is 0.30 meters across the top and bottom of the ramp. Grocery store furniture should be low in height so it is easy for wheelchair users and circulation space min 1.50m to 1.80m to allow easy passage of two wheelchairs without any obstructions, may passage have a width less than 1.50m but not less than 0.90m. Guide floor materials, an evacuation chair, textual signs must be provided. Need to provide more windows for natural ventilation.
Flooring	• VCT (vinyl composition tile) material is used for flooring.		The tiles are non-slippery so there is no difficulty to use mobility equipment.	
Furniture	• Grocery store furniture is not are in low height.		All Furniture is not wheelchair accessible.	
Exterior	• Long entry passage is provided for entrance. • There are no trees in the entry area.		The Exterior area is accessible for physically challenged people but there, is no kind of landscape.	
Pathway	• Worm brick Concrete floor blocks are used.		The pathway is accessible and barrier-free for physically challenged people.	
Toilet	• There is no provision for the toilet.		-	
Evacuation	• There is no provision for an Evacuation chair.		There is no evacuation chair for mobility-impaired people, if any emergency happened then they might be face difficulty.	

Light Ventilation	• A full-height spider glass is provided for the entrance. • And there is mechanical ventilation, no windows for natural ventilation.		There are not enough windows for natural ventilation.	
Circulation	• There is not enough space in between the furniture.		There is not enough space for mobility-impaired people to operate their mobility devices.	
Door	• A glass door is provided for entry and exit.		There is not enough landing space in front of the door so it is difficult for disabled people to get in through the door.	
Guide Floor	• No guide floor material is provided.		Guiding floor material is not there to guide visually impaired people.	
Textural Indications	• There is no kind of textural indication.		Visually impaired people suffer because there is no textural indication.	
Building Typology	Grocery Shop			
Name	Dhananjay super shopee			
Location	Kolhar Ghoti Rd, Akole, Maharashtra 422601			
Architectural Building Elements	**Description**	**Photograph**	**Remark**	**Inference**

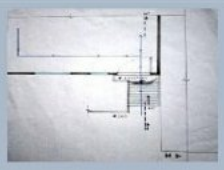
Entrance And Exit  	• Steps are provided. • There is no provision of a ramp.		The entrance is not wheelchair accessible and the Railing is not proper for Visually impaired users.	There is an absence of architectural elements within the structure and some built elements create an obstruction for mobility equipment which causes inconvenience to disabled people for entering the service. There is a need to provide a ramp with proper ratio with handrails and extra rail on top and bottom and with an extended railing that is 0.30 meters across the top and bottom of the ramp. Grocery store furniture should be low in height so it becomes easy for wheelchair users and circulation space min 1.50m to 1.80m to allow easy passage of two wheelchairs without any obstructions, may passage has a width less than 1.50m but not less than 0.90m. It is necessary to provide paving blocks for the exterior pathway. Guide floor materials, an evacuation chair, textual signs must be provided. need to provide more windows for natural ventilation.
Flooring	• VCT (vinyl composition tile) material is used for flooring.		The tiles are non-slippery so there is no difficulty to use mobility equipment.	
Furniture	• Grocery store furniture is not are in low height.		All Furniture is not wheelchair accessible.	
Exterior	• There is not enough parking space and no any kind of landscape.		There is not plain surface for movement of wheelchair.	
Pathway	• Mud floor is there.		There is no any kind of artificial flooring natural flooring is there because of that there is no plain floor.	
Toilet	• There is no provision for the toilet.		-	
Evacuation	• There is no provision for an Evacuation chair.		There is no evacuation chair for mobility-impaired people, if any emergency happened then they might be face difficulty.	
Light Ventilation	• Mechanical light and ventilation are provided and spider glass is provided in front of the shop for light.		There are not enough windows for natural ventilation.	

Circulation	• There is not enough space in between the furniture.		There is not enough space for mobility-impaired people to operate their mobility devices.	
Door	• A glass door is provided for entry and exit.		There is enough space for landing but there is a riser to enter through the door which causes difficulty for people with disabilities.	
Guide Floor	• No guide floor material is provided.		Guiding floor material is not there to guide visually impaired people.	
Textural Indications	• There is no kind of textural indication.		Visually impaired people suffer because there is no textural indication.	

Building typology	Bank
Name	Ahmednagar District Central Co-Operative Bank
Location	SH44, near Sarda Petrol Pump, Akole, Maharashtra 422601

Architectural Building Elements	**Description**	**Photograph**	**Remark**	**Inference**
Entrance And Exit  	• Steps are provided for entry of bank and ATM and there are no ramp and railings.		The entrance is not wheelchair accessible because there is no provision of a ramp, Railing is not there to support visually impaired people.	There are missing architectural elements and some built elements create barriers for mobility equipment that causes people with disabilities to struggle a lot. There is a need to provide a ramp with proper ratio with handrails and extra rail on top and bottom and with an extended railing that is 0.30 meters across the top and bottom of the ramp. It is necessary to provide
Flooring	• Ceramic floor tile (glossy finish) is used.		The floor is slippery which makes it difficult to use mobility equipment.	
Elevators	• The elevator is not provided.		Wheelchair users face difficulty because there is no provision of an elevator.	

Furniture	• The height of the bank desk and cash counter is not low.		The height of furniture is high which causes difficulty for wheelchair users.	non-slippery tiles for the interior flooring and paving blocks for the exterior pathway. The corridor should provide without obstacles. Accessible toilet and guide floor materials, an elevator, an evacuation chair, textual signs must be provided. Need of accessible furniture.
Exterior	• A long passage is for entry. • Liner trees are planted at one side of the site to create shad for parking.		Natural flooring is there because of that there is no plain floor it causes wheelchair person face difficulty to get in.	
Pathway	• Mud floor is there.		Difficulty while operating a mobility device.	
Toilet	• There is no public toilet.		-	
Light Ventilation	• Large windows and ventilators are provided. • Mechanical light and fans are provided.		Light and ventilation are good and enough.	
Corridor	• The plastic grass mat is spread on the floor which creates an obstruction in the corridor.		There is an obstruction in the corridor so it is difficult for physically challenged people to get enter through a corridor.	
Guide Floor	• No guide floor material is provided.		Guiding floor material is not there to guide visually impaired people.	
Circulation	• There is enough space for circulation and an Adequate seating arrangement.	 	There is enough circulation space for physically challenged people to operate their mobility devices.	
Door	• A metal folding door is provided for the entrance and the other are single and double wooden doors.		There is a step in front of the door so there is not enough landing space in front of the door so it is difficult for people with disabilities to enter through the door.	

Textural Indication	• There is no kind of textural indication.		Visually impaired people suffer because there is no textural indication.	
Evacuation	• There is no provision for an Evacuation chair.		There is no evacuation chair for mobility-impaired people, if any emergency happened then they might be face difficulty.	
Building typology	Bank			
Name	State Bank Of India			
Location	Akole Karkhana Road, Maharashtra India, Akole, Maharashtra			
Architectural Building Elements	**Description**	**Photograph**	**Remark**	**Inference**
Entrance And Exit  	• Steps are provided for entry of bank and ATM, the railing is provided only one side of the stair on the other side there is a wall where railings are not provided. • There is no ramp.		The entrance is not wheelchair accessible as there is no provision for the ramp. For railings, extra rail is not given and railings are only given on one side of the stairs causing difficulty to visually impaired users.	There is a lack of architectural elements which makes it difficult for physically challenged people to access the service. There is a need to provide a ramp with proper ratio with handrails and extra rail on top and bottom and with an extended railing that is 0.30 meters across the top and bottom of the ramp. It is necessary to provide non-slippery tiles for the interior flooring. The circulation space should provide large and without obstacles. Accessible toilet and guide floor materials, an elevator, an evacuation chair, textual signs must be provided.
Flooring	• Ceramic floor tile (glossy finish) is used.		The floor is slippery which makes it difficult to use mobility equipment.	
Elevators	• The elevator is not provided.		Wheelchair users face difficulty because there is no provision of an elevator.	
Furniture	• The height of the bank desk and cash counter is low.		Wheelchair users do not face difficulties as the height of furniture is low.	

Exterior	• There is not enough parking space and no kind of landscape.		Physically challenged people get access to the exterior areas without getting difficulties.
Pathway	• Worm brick concrete floor blocks are used.		Because of concrete floor blocks, there is no kind of issue to run mobility devices.
Toilet	• There is no public toilet.		-
Light Ventilation	• Windows are provided for natural ventilation. • Mechanical light and fans are provided.		Light and ventilation are good and enough.
Corridor	-		-
Guide Floor	• No guide floor material is provided.		Guiding floor material is not there to guide visually impaired people.
Circulation	• There is not enough circulation space.		There is not enough circulation space to run mobility devices.
Door	• Metal and wooden door is provided for the entrance.		There is a step in front of the door so there is not enough landing space in front of the door so it is difficult for people with disabilities to enter through the door.
Textural Indication	• There is no kind of textural indication.		Visually impaired people suffer because there is no textural indication.
Evacuation	• There is no provision for an Evacuation chair.		There is no evacuation chair for mobility-impaired people, if any emergency happened then they might be face difficulty.

Conclusions: Emergency services aren't physically accessible to everyone, Because of the lack of architectural elements in the design, there is a need to provide at least a basic architectural building element with a proper ratio that gives access to built spaces for physically challenged people. This little bit of change can make their lives happier.

References: https://pubmed.ncbi.nlm.nih.gov/32587166

https://europepmc.org/article/MED/33614567

en.wikipedia.org/wiki/COVID-19_pandemic_lockdown_in_India

STUDY OF VALUES ASSOCIATED WITH RURAL OPEN SPACES (VILLAGES OF WESTERN MAHARASHTRA)

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Abstract: The definition of open space varies according to the context in which it is situated. Open space in rural areas like agricultural land, coastal land, river bank, hills and hill slopes, temple and its surrounding etc. are most closely connected with the natural environment, tradition and culture of the land. These open spaces have values and significance in themselves and in their wider context. Open spaces are significant for public enjoyment, recreation and education. Values associated with Rural Open Spaces viz. Functional, Educational, Aesthetical, Ecological, Socio- cultural, Economic are important and interconnected. Use of these open spaces and their importance varies among people. Due to the urbanisation, human intervention and impact of calamities, characteristics and identity of the rural open spaces are changing. This issue evokes the sensitivity towards rural open spaces. Case study of villages in Western Maharashtra gives experience and insight into the issue which helps in summarising the importance of values associated with rural open spaces.

Keywords: Rural open space, values

1. Introduction:

Rural open spaces are of different variety and have special and different characteristics where people live, work and take part in social and recreational activity. Rural open spaces can be enrich with natural beauty and help to maintain the ecosystem. Some of these spaces have features which are valuable for archaeology. They may have history and have association with the local communities. Relation of people with rural open spaces changes over time period and their values varies among people.

This paper provides insight into the use of Open Spaces in the Villages of Western Maharashtra and summarises the significance of various values associated with Open Spaces.

1.1 Aim:

To study the values associated with open spaces in the Villages of Western Maharashtra.

1.2 Objectives:

1. To understand the rural open spaces in Indian Context.
2. To understand the rural open spaces in the context of Maharashtra.

3. To identify and categorised the rural open spaces.

4. To study and analyse the activity associated with open spaces in the Villages of Western Maharashtra.

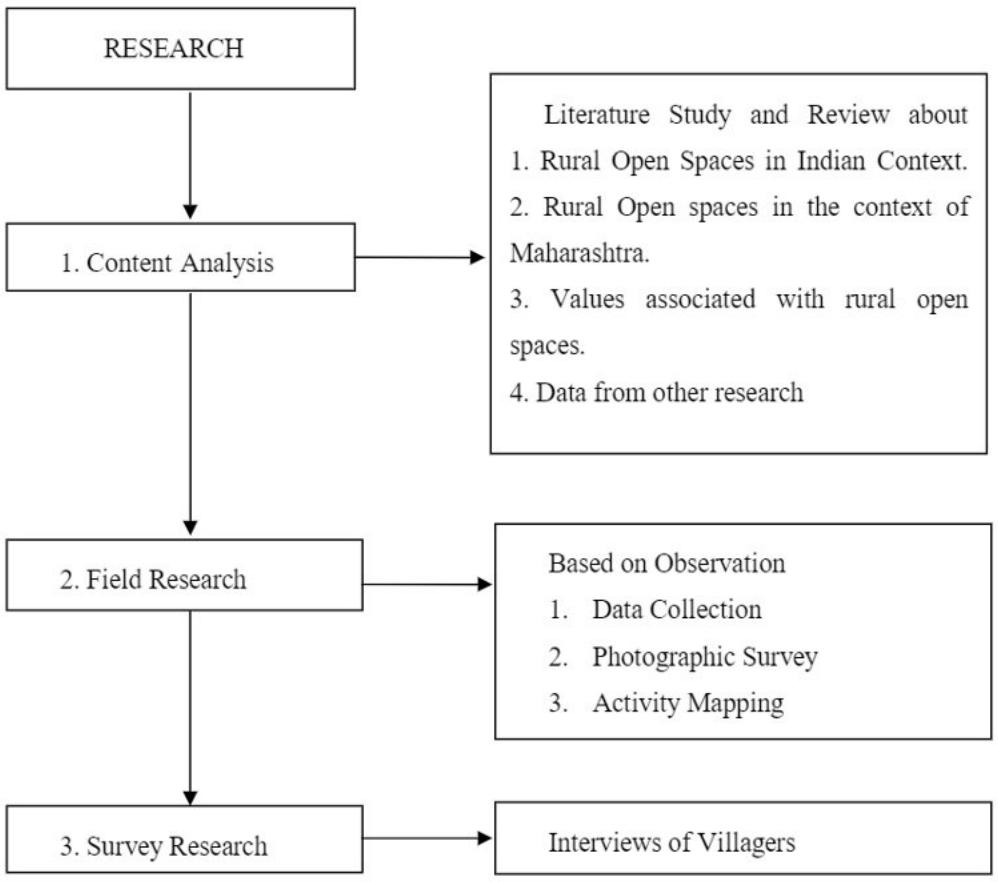
1.3 Research queston:

- Which are the landscape values associated with rural open spaces?
- What is the significance of these values?

1.4 Scope and limitations:

- Scope of the study includes the study of Rural Open Spaces and its importance to the village communities.
- Study is limited up to the study of values associated with Rural Public Open Spaces in the villages of Western Maharashtra.

1.5 Research methodology:



2. Literature review

2.1. Indian villages – settlement and structure

Village is the basic unit of Rural society in India. The Vedic period in India prevailed approximately from 1500BC to 500BC. In this period Aryans emerged in the ancient land of India. Vedic civilisation was took place in the north and north western part of India, near the river Saraswati. Aryans cleared the forest near the Gangetic plains and settled down to form the Vedic civilisation. In the Vedic civilisation agriculture gained the importance, land and cattle became very important. By the end of the letter Vedic age, agriculture had become the main occupation of the Vedic Civilisation. Their involvement in agriculture led to the formation of village. Many villages together form the kingdom. These kingdoms later merged with each other to form large kingdom. The Vedic civilisation was highly organised at social as well as political level. From the Vedic period village is the basic unit of rural society in India. The caste system had emerged during the Vedic age which is still in practice in the villages. Group of families and collection of dwellings and cultivated land are the principal physical features of the villages.

2.2. Gandhian concept of rural development

Mahatma Gandhi as a visionary of India had a very clear perception of its villages and made an emphatic assertion that "India lives in her seven and half lakh of villages. He further believed that India will have to live in villages, not in towns, in huts not in palaces. He held this conviction by saying that, "If Villages perish, India will perish too". Rural development as outlined by Gandhiji contained self sufficiency, Inter-dependence for other wants and development of village industries. Gandhiji's ideal villages belong to the Pre-British period, when Indian villages were the small republics undisturbed by the periodical visitations of barbarious hordes. This republican character of the villages was destroyed by the British rule.

Gandhiji aimed at the attainment of village Swaraj which is a complete republic, independent of its neighbours for its own vital wants and get interdependent for many others in which dependence is a necessity. Thus every village's first concern will be to grow its own food crop and cotton for its cloth. It could have a reserve for its cattle, recreation and playground for adults and children. Then if there is more land available, it will grow useful money crops, thus excluding ganga, tobacco, opium and the like. The village will maintain a village theatre, school and public hall. It will have its own water works ensuring clean water supply. The village envisaged by Gandhiji could be constructed on the basis of the principles of public hygiene and sanitation. The houses which are to be built with locally available material will have sufficient light and ventilation. Each house or cottage shall have a courtyard to grow vegetables for domestic consumption and to house cattle. The village street and lanes will be kept clean.

Gandhiji was very keen to bring about maximum regional self-sufficiency in regard to food, clothing and shelter in rural areas. To solve poverty he emphasised not only agriculture but also cottage and small scale industries. He focused his attention on non agricultural aspects of the rural economy also. He wanted diversified economic activities in the villages and thus stood for all around development of rural India.

2.3. Villages in Maharashtra – Open Space Structure

Maharashtra the land of the Marathi speaking people located in the north centre of Peninsular India. Maharashtra is the third largest and most advanced state in India. Maharashtra falls into three broad geographic divisions. The Konkan is the coastal lowland running from just north of Bombay (Mumbai) to Goa. Inland from this area the Western Ghats, a line of hills that parallels the west coast of India.

Villages in Maharashtra are enriching by natural resources. A typical village in Maharashtra is a collection of mud-stone-and straw dwellings surrounded by agricultural fields.Agriculture is the basic source for livelihood. Few families are settled in the agricultural fields for convenience. Few villages are surrounded by mountain ranges. A local well or nearby pond or river provides water for most villages. Some larger villages have running water. A council of elected elders, called a panchayat, governs most villages. The panchayat has the power to hear complaints and administer punishments. Few villages in Maharashtra do not have proper approach road and public transport facilities and are dependent on other villages or nearby city for school and medical facilities. Temple premises are the space for celebrating various cultural and religious activities which facilitates social awareness through entertainment and help to develop the social bonding.

2.4. Categories and types of rural public open spaces

Rural open spaces can be categorised as follows

a) Open Space in Vicinity of Water Resources

- River bank / Ghats
- Stream , Lake
- Canal
- Dam / Back Water
- Well and its surrounding
- Public Water Supply

http://en.wikipedia.org/wiki/Category:Villages in Maharashtra

- b) Open Spaces for Social Interaction
- Main Road, Internal Lanes, Pathways
- Temple and its Surroundings
- Chawdi / Par
- School Ground
- Play ground, Health Club / Akhada
- Market Place
- Space for Fair, Religious Week

c) Virgin Open Spaces

- Hills and Hill slopes
- Scrub Land
- Grazing Yard
- Sacred Grooves
- Forest

2.5. Values associated with rural open spaces and its significance

- Functional Value: It is the service provided by open space and therefore prevention of open space is necessary eg. Protection of water quality, minimisation of soil erosion.
- Aesthetical: Aesthetic value can be easily understood by us when we experience the beauty of the open space. People admire natural open spaces and it relieves the work stress and hence protecting open space is important.
- Ecological: Open spaces supports the various local unique species of plant and animal and their association which are valuable and hence ought to be protected.
- Socio cultural: Open space eg. Temple and surrounding premises, river banks etc. provide space to relax, interact, play, engage in physical activities.

Economic: Many people visit forests, beaches, mountains, rivers, lakes, and streams for extended vacations or for shorter period for relaxation. These open spaces serve income generating activity. Agriculture fields forms the backbone of economic activity. *Natural Resource Management, PGDESD syllabus, IGNOU.*

All these values are interconnected and its importance varies among people.

3. Case studies

Criteria for selection

Both cases village Dholwad and village Mandede are in Pune, Maharashtra so able to give visits to the villages and convenient for communication and understanding villagers feelings and their association with the open spaces.

Both spaces are different in location context, geographical features and natural surroundings. Both spaces have different open space structure and typology of open spaces which helps to gives insight and understanding of the subject.

Format for case study

- Regional Context
- Local Context
- Socio-cultural Context
- Ecological Context
- Present Open Space Structure of the Village
- Present Activity Pattern in the Village
- Visual Analysis of Open Spaces
- Analysis of Open Spaces

3.1 Case 1 – Village Dholwad

Location: - 100 Km. from Pune on Pune- Nashik Highway. Dholwad is a midsized (population is 3500 people) village located in Junnar taluka in the district of Pune in the state of Maharashtra.

3.1.1 Regional context

Village Dholwad is located in Pune region. Pune District is in the western region in Maharashtra in India. Pune district lies in the Western Ghats or Sahyadri mountain range and it extends on to the Deccan Plateau on the east. Pune stands on the leeward side of the Western Ghats.

Fig.2 Local Context of Village Dholwad.

3.1.3 Socio cultural context

Village Dholwad is located on a East bank of River Pushpawati. Small Ghat is builted on the river which is used for washing, drying. Previously ghat was also used for bathing but now every house has a gram panchayat water connection. Temples are built on the bank of river. Agriculture is the basic source for livelihood. Youngsters from the village do job/working in the Pune, as village is near from the Pune city and have many opportunities.

3.1.4 Ecological context

LAND: Village is enrich by river Pushpawati, a natural source of water which facilitate the agriculture. Most of the agricultural land is under cultivation of sugercane crop.

WATER: Village is setteled on the bank of the river. Previously river water was directly used for drinking purpose but now every house has a water connection in the house.

VEGETATION: Most of the land is under cultivation of crops. Various plants and bird species are found along the bank of the river.

3.1.5 Present open space structure

River Pushpawati flows north-south. Village Dholwad is settled along the east bank of the river. Village field surrounds the settlement and are within walking distance. Dwellings in the village are built very close to one another with small lanes for passage of people and small vehicles. Village has nucleated settlement near the river. Along the river bank open space is assigned to temples and fair. Small ghat built on the river is used for washing clothes, cattle. Basic business is agriculture for the village; therefore dispersed settlements are seen in the farms. Dholwad is connected through horizontal linkages with other villages which are Ozar, Otur, Umbraj, Hivare, Pansarwadi.

Fig.3 Open Space Structure of Village Dholwad

3.1.6 Present activity pattern

Major activity in the village is farming. Farm fields surround the nucleated settlement. For convenience and because of lack of space few families are settled in the fields along the road. An open space along the river is assigned for temples and religious activity and also for fair. Children use the open space in temple premises for playing. A ghat on the river is used by the village women for washing, drying and also relaxes for a while. Various religious activities are carried out in the temples and premises throughout the year.

Image source: Google earth

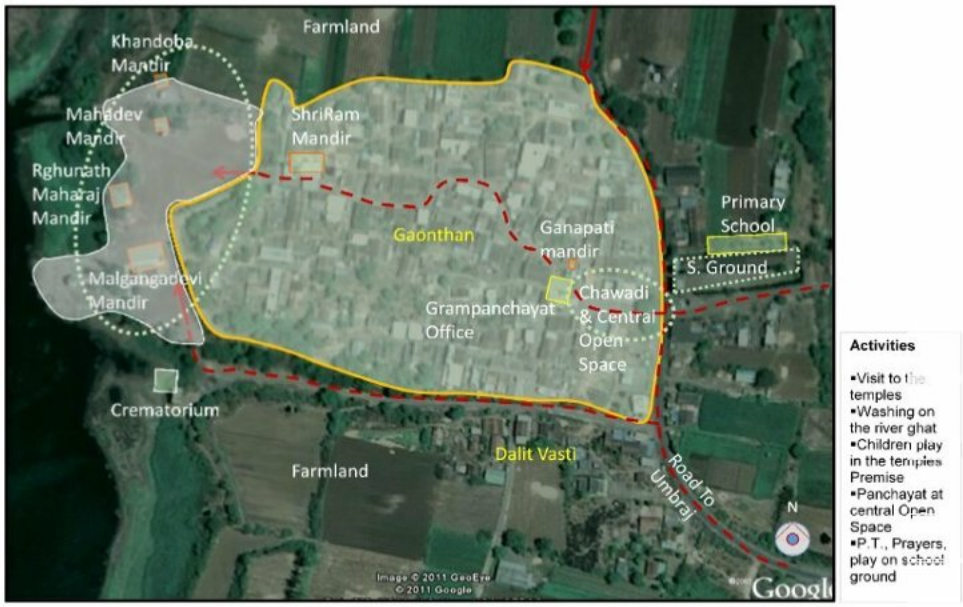


Fig.4-a Activity Pattern in Village Dholwad.

One of the temples built on the bank of river is the Goddess Malganga Temple. In Navratri a person from each house of the village is devoted for the worship of Goddess for nine days. The person is not allowed to go home and in the village and he have to live in the temple and temple premises in the service of god till Dashera. The person can go outside the village Dholwad from the periphery of the village but not from within the village. It is a rule in the village from long time and it is still carried out for nine days. On Dashera a tenth day of Navratra festival, a grand ritual takes place in the temple.

Fig.4-b Activity Pattern in Village Dholwad.

3.1.7 Visual analysis of open spaces

Fig.5 Way to the Village Dholwad

Fig.6 Entrance to the Village Dholwad


Fig.7 Central open space in front of the Panchayat Office


Fig.8 Way to the temples premises and to the Ghat on the River


Fig.9 Temple premise on the Bank of the River Pushpawati



Fig.10 Temples along the River Pushpawati

Photograph source: Visit to the village Dholwad, Junnar, Pune.


Fig.11 River Pushpawati

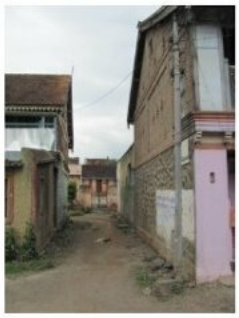


Fig.12 Internal Lanes connecting dwellings and other open spaces


Fig.13 Chawadi and Panchayat Office


Fig.14 Primary and Secondary School Ground

Photograph source: Visit to the village Dholwad, Junnar, Pune


Fig.15 Agricultural Fields


Fig.16 Linkages to the Agricultural Fields and to the other villages

Inferences from the visuals

- Variations in use of open spaces and user group .
- Landscape treatment is attempted for temple premise and locally available material is used (eg. Stone for steps).
- Two parts in the village, one is nucleated settlement and other is farm land.

3.1.8 Case Study – 1- Analysis

CASE STUDY - 01

3.1.8 ANALYSIS OF OPEN SPACES IN THE VILLAGE DHOLWAD, JUNNAR, PUNE

TYPES OF OPEN SPACES	VISUALS	ACTIVITY	NATURAL ELEMENTS ASSOCIATED WITH OPEN SPACES			VALUES ASSOCIATED WITH OPEN SPACES			
			LAND	WATER	VEGETATION	FUNCTIONAL	AESTHETIC	SOCIOCULTURAL	ECOLOGICAL
RIVER PUSHPAWATI AND RIVER BANK	 Sculptural land form along the river bank.  Ghat on the river	•Small ghat built on the river is used for washing clothes and cattle's. •In summer children and also men enjoy swimming in the river.	•Slightly sloping land towards river covered with vegetation creates sculptural quality along the bank. •Top soil washed from the uplands to become the silt of the river.	•Free flowing river enrich the natural landscape of the village Dholwad. •River water is the major supporting element for agriculture. •River is the natural drainage way.	Dense natural vegetation along the river bank increase the scenic quality of the space and helps in soil stabilization and water retainsion.	•Microclimate moderation. •Natural food source and habitat for birds and animals.	Gives experience of natural landscape. Sight and sounds of water evoke a sense of pleasure.	•Provide outdoor recreational activities like swimming, community gathering, relaxing. •The behavior of species (flora & fauna) gives villagers an important indications of events that are of social, environmental or agricultural significance.	Soil and adequate water supply are essential to all living organism hence contributes in maintaining the ecosystem.
TEMPLE AND ITS SURROUNDINGS ALONG THE RIVER BANK	 Way to the Temple Premises.  God Idols at the river bank  Open space for fair	Various religious activities are carried out in the temples and premises throughout the year. Part of the open space is assigned for fair which held in month of March/ April otherwise it is cricket/football ground for children.	Various temples are placed on a flat terrain along the river. This open space is connected with the uplane core village with stone paved pathway and steps.	Temples on the background of free flowing River Pushpawati gives picturesque quality to the space.	Coconut trees planted along the pathway and steps leading to the temples creates avenue. Natural vegetation along the bank of the river temper the heat .	It is a buffer zone between the river and village which facilitate various religious activity.	Temples on the backgrounc of flowing river and riverside lush green vegetation gives the picturesque quality to the space.	•Facilitates the community gathering through religious and cultural activities and help to enhance the social bonding. •Through these activity traditional local rituals and social customs are forwarded to the next generation.	Religious beliefs asscciated with natural elements helps in their conservation.

3.1.8 ANALYSIS OF OPEN SPACES IN THE VILLAGE DHOLWAD, JUNNAR, PUNE

TYPES OF OPEN SPACES	VISUALS	ACTIVITY	NATURAL ELEMENTS ASSOCIATED WITH OPEN SPACES			VALUES ASSOCIATED WITH OPEN SPACES			
			LAND	WATER	VEGETATION	FUNCTIONAL	AESTHETIC	SOCIOCULTURAL	ECOLOGICAL
CHAWADI	 Chawadi  between the Panchayat Office and  Panchayat office	•It is a place for every day gathering of male community for reading news paper, chatting and discussions. •A council of elected elders called Panchayat hear the complains, social issues and gives the decision.	Open space in the core of village surrounded by houses.		Quality of the space is govern by a Pipal tree	Space for community gathering.	Central access leads to the village at one side and at another side leads to the agricultural fields is adorn by trees with tree pits (Chawadi) at the entrance.	It is a place for social gathering especially for men community In case of any complaint, social issue whole village is gathered in the central open space to hear the decision taker by the Panchayat.	Two canopy trees at the entrance temper the heat . Villagers and visitors relaxes for a while under the tree.
SCHOOL GROUND	 Primary School and school Ground  Secondary School	Ground is used for P.T. to the school children. Children play on the ground before school and after school also in the recess. Children play on the ground on Sunday and also in the vacations.	Primary school is very near from the entrance to the village. School ground which is a rammed earth is enclosed by the tree. Newly developed secondary school is surrounded by agricultural field.	Gram Panchayat water supply to the school.	Ashoka trees provide the enclosure to the Primary School ground. It acts as a visual, sound barrier and temper the heat. Secondary school ground is also enclosed by tree which is in front of the school building and surrounded by agricultural fields.	School ground provides free play area to children to explore various games and it contributes to their physical developments.	School grounds are enrich with the natural surroundings which relieves the stress and set the mood.	Earthen ground with natural surroundings provides a space to children for playing , learning, sharing which helps children to socialize.	Earthen ground surrounded by natural landscape with minimum human intervention does not creates any bad impacts on ecosystem.

3.1.8 ANALYSIS OF OPEN SPACES IN THE VILLAGE DHOLWAD, JUNNAR, PUNE

TYPES OF OPEN SPACES	VISUALS	ACTIVITY	NATURAL ELEMENTS ASSOCIATED WITH OPEN SPACES			VALUES ASSOCIATED WITH OPEN SPACES			
			LAND	WATER	VEGETATION	FUNCTIONAL	AESTHETIC	SOCIOCULTURAL	ECOLOGICAL
AGRICULTURAL FIELDS	 Groundnut field on the back ground of Banana orchard.  Sugarcane field along the road.	Farming is the major activity in the village.  Natural lake in the field	Farm fields surrounds the nucleated settlements. Few families are settled in the fields.	Presence of flowing river facilitates the farming. Natural lakes in the fields make the farming easy.	Due to the availability of water main crop is sugar cane in the village Seasonal crops (Wheat, Bajara, Ground nut, vegitables) are also cultivated in the fields.	Agricultural fields and presence of water make the village self sustainable. Source of food and timber.	Nucleated village settlements surrounded by agricultural fields with presence of river and lakes gives the experience of natural landscape.	In winter in the village Punam Festival celebrates diversity of crops when food prepared from their farms are offered to the village goddess in gratitude for showering her blessings for a diverse harvest.	Presence of water and vegetation temper the heat. Extensive farming may cause soil erosion, loss of soil and increase in sedimentation in the river Pushpawati.
						ECONOMIC	Agriculture forms the backbone of economic activity in the Village Dholwad.		
GRAZING YARD	 Cattle are grazing along the road.  Grazing yard	Cattle grazing	Crops grown on fields which are not under crop cultivation is provides the grazing yard. Vegetation along the river bank and along the road is also a preferred option for grazing.		Vegetation grown in the rainy season is the feast for cattle.	Some time cattle are purposely left free in the agricultural field for grazing so that fields get cleared off for crop cultivation.	Varied grasses with varied shades of green is visual pleasure in the rainy season.	Milk of the cattle which are left free for grazing is considered to be healthy and good for human consumption than the milk of the cattle who eat grass in the shed	Open spaces which are used as grazing yard supports significant biodiversity.

3.1.8 ANALYSIS OF OPEN SPACES IN THE VILLAGE DHOLWAD, JUNNAR, PUNE

TYPES OF OPEN SPACES	VISUALS	ACTIVITY	NATURAL ELEMENTS ASSOCIATED WITH OPEN SPACES			VALUES ASSOCIATED WITH OPEN SPACES			
			LAND	WATER	VEGETATION	FUNCTIONAL	AESTHETIC	SOCIOCULTURAL	ECOLOGICAL
CREMATO-RIUM	 Surrounding of crematorium  Way to the crematorium	Farming is the major activity in the village.	Cremation ground is located near river. It is a barren land with some seasonal vegetation around it.	After cremation rituals related with water are carried out along the river bank.	In the premises of cremation ground trees of Babool are seen.	Agricultural fields and presence of water make the village self sustainable Source of food and timber.		After cremation people take bath in the river which is ritual. Till thirteen days various rituals take place in which flowing river have the importance.	Due to the cremation there is no vegetative growth in and around the cremation ground.
MAIN ROAD, INTERNAL LANES, PATHWAYS	  Way to the Dholwad  Road in front of the primary school towards agricultural fields.	Connectivity and movement.   Internal lanes connecting the dwellings and other open spaces	Dholwad is connected through roads with other villages which are Ozar, Otur, Umbraj, Hivare, Pansarwadi . Dwellings in the villages are connected with small lanes for passage of people and small vehicles.	Nalas/ stream along road with dense vegetation	Roads are adorn by the roadside agricultural fields.	Road facilitate the pedestrian and vehicular movement in the village and to the surrounding villages and Pune city.	Free flowing roads with natural surrounding creates interest in the movement.	Connectivity within the village and with other villages and to the city provides scope of interaction and information.	External roads are of tar which exerts heat. Vehicular movements may affect the wild species (flora and Fauna)

3.1.8 ANALYSIS OF OPEN SPACES IN THE VILLAGE DHOLWAD, JUNNAR, PUNE

TYPES OF OPEN SPACES	VISUALS	ACTIVITY	NATURAL ELEMENTS ASOCCIATED WITH OPEN SPACES			VALUES ASSOIATED WITH OPEN SPACES			
			LAND	WATER	VEGETATION	FUNCTIONAL	AESTHETIC	SOCIOCULTURAL	ECOLOGICAL
RIVER PUSHPAWATI AND RIVER BANK	 Sculptural land form along the  Ghat on the river	•Small ghat built on the river is used for washing clothes and cattle's. •In summer children and also men enjoy swimming in the river	•Slightly sloping land towards river covered with vegetation creates sculptural quality along the bank. •Top soil washed from the uplands to become the silt of the river	•Free flowing river enrich the natural landscape of the village Dholwad. •River water is the major supporting element for agriculture. •River is the natural drainage way	Dense natural vegetation along the river bank increase the scenic quality of the space and helps in soil stabilization and water retainsion.	•Microclimate moderation •Natural food source and habitat for birds and animals.	Gives experience of natural landscape. Sight and sounds of water evoke a sense of pleasure.	•Provide outdoor recreational activities like swimming, community gathering, relaxing. •The behavior of species (flaura & fauna) gives villagers an important indications of events that are of social, environmental or agricultural significance.	Soil and adequate water supply are essential to all living organism hence contributes in maintaining the ecosystem.
TEMPLE AND ITS SURROUNDINGS ALONG THE RIVER BANK	 Way to the Temple Premises.  God Idolls at the river bank  Open space for fair	Various religious activities are carried out in the temples and premises throughout the year. Part of the open space is assigned for fair which held in month of March/ April otherwise it is cricket/football ground for children.	Various temples are placed on a flat terrain along the river. This open space is connected with the upland core village with stone paved pathway and steps.	Temples on the background of free fowing River Pushpawati gives picturesque quality to the space.	Coconut trees planted along the pathway and steps leading to the temples creates avenue. Natural vegetation along the bank of the river temper the heat.	It is a buffer zone between the river and village which facilitate various religious activity.	Temples on the background of flowing river and riverside lush green vegetation gives the picturesque quality to the space.	•Facilitates the community gathering through religious and cultural activities and help to enhance the social bonding. •Through these activity traditional local rituals and social customs are forwarded to the next generation.	Religious beliefs asscciated with natural element s helps in their conservation.

3. Case studies

3.2 Case 2 – Village Mandede

Location: - 45 Km. from Pune on ahead from Paud village. Mandede is a small village(population is 1200 people) located in Mulshi taluka in the district of Pune in the state of Maharashtra.

3.2.1 Regional Context

Village Mandede is located in Pune region.

3.2.2 Local Context

Village is surrounded by hills from South West and North West. Adjacent village to the Mandede is Andeshe. The way to Mandede is from village Paud in Mulshi taluka.

Fig. 17 Mandede located in Pune region in Western Maharashtra, India.

Fig. 18 Local context of village Mandede *Image source: Google earth*

3.2.3 Socio Cultural Context

Settlement within the village Mandede is divided in six divisions depending on the cast and location in the village and according to that name is given and also from the features in the settlement. The divisions are Malwadi, Dhumal Wadi (settlement of people having surname Dhumal), Jeeva Veer Wadi (settlement of people having surname Veer), Parakhe Wadi, Ram Wadi (settlement of Matang people with temple of Lord Rama, Datta Wadi (settlement with temple of Lord Datta), and settlement of Harijan. Various religious and cultural activities are carried out in the village. Agriculture is the basic source for livelihood. Youngsters from the village works in the Pune city. Within the village there are three schools, two of which are primary schools and one is up to standard seventh. For further study the children have to go to Khechre Dairy (which is out of the village and have school up to standard tenth) or to Paud village (school up to standard twelfth).

Village do not have public transport facility. Market place is at village Paud. Village has small provision stores but for buying fruits, vegetables and medicines they have to go to the village Paud.

3.2.4 Eological Context

LAND: It is a sloping terrain surrounded by hills. Slope is from South West and North West. Hill slopes are covered with natural vegetation and other land is under cultivation of rice. Few land from the village is bought by the outsiders for farmhouses.

WATER: A natural stream coming flowing from the hills is the main source of water for the village. Slowly the stream got dry in the summer. Wells constructed along the stream are the source of water for agriculture and from the wells water is uplifted to the overhead water tank which is constructed in Ramwadi and from the water tank water is distributed to the whole village for domestic purpose. In the summer from month of March to May villagers suffer from the shortage of water.

VEGETATION: Hill slopes are enriching by natural vegetation. Mango plantation is the main money giving crop for the villagers. Rice crop is cultivated on the farmland. Cultivation of crop is depends on the rain.

3.2.5 Present Open Space Structure

Village Mandede is surrounded by hills from South-West and North-West. Village has dispersed settlements surrounded by the agricultural fields. Settlements and agricultural fields are connected by pathways. Dwellings in the villages made up of mud, brick are built very close each other with small lanes for passage of people. Stream flows from the hills is the main source of water for village.

Fig. 19 Open Space Structure of village Mandede

3.2.6 Present Activity Pattern

Village settlements are divided in six divisions. Settlements are surrounded by agricultural fields. Farming is the major activity in the village which is dependent on rain water. Mango is the money giving crop in village which has sell out of the village and other crop is rice which also has demand in the city. Rice crops are cultivated in the month of June and after four months crop is ready for cutting. Raw rice is then taken to the mill for final product. Various cultural and religious activities are taken place in the temple premises. In the temple of Lord Rama Ramnavamee is celebrated with a five days reading of religious scriptures. Village has school up to standard seventh; children have to go to Paud village or Pune for further study.

3.2.7 Visuals of Open Spaces in the village Mandede


Fig. 19 Way to the Village Mandede


Fig. 20 Mango Plantation and Rice Farms Adorn Road



Fig. 21 Village is Surrounded by Hills


Fig. 22 Stream Flowing Through the Village



Fig. 23 Use of Stone for Construction

Fig.24 Sanitation within Settlement


Fig. 25 Internal Lanes within Settlements

Fig. 26 Use of Natural Resources in the Village

Photograph source: Visit to the village Mandede, Mulshi, Pune

Inferences from the visuals

- Village is enriched by natural surroundings which is picturesque and refreshing.
- Dispersed settlements surrounded by farm land.
- Use of locally available materials (eg. Wood, stone, rice staw) for buildig houses.
- Use of wood as a fuel.
- Human interventions are limited in natural landscape.

3.2.8 Case Study -2- Analysis

CASE STUDY - 02

3.2.8 ANALYSIS OF OPEN SPACES IN THE VILLAGE MANDEDE, MULSHI, PUNE

TYPES OF OPEN SPACES	VISUALS	ACTIVITY	NATURAL ELEMENTS ASSOCIATED WITH OPEN SPACES			VALUES ASSOIATED WITH OPEN SPACES			
			LAND	WATER	VEGETATION	FUNCTIONAL	AESTHETIC	SOCIOCULTURAL	ECOLOGICAL
HILLS AND HILL SLOPES	 Hills and hill slopes gives the spatial character to the village.	•Cattle are taken to the hill slopes for grazing. •Wood as a fuel is collected from hill slopes and surrounding.	•Hills surrounding the village gives enclosure to the village.	•Hills maintain the water flow in the stream which is the main source of water for village.	Vegetation on the hills and hill slopes captures and slowly releases huge amount of water during non rainy period.	•Provide water and soil. •nursing crop fields both in hills and plains by providing soil and nutrients. •Contributes to pollution control and climate moderation. •Support biodiversity.	•Gives experience of beauty of nature. •Natural surroundings relieves work stress.	•Provide outdoor recreational activities like trekking, hunting. •The behavior of species (flora & fauna) gives villagers an important indications of events that are of social, environmental or agricultural significance.	•Provide habitat for birds, pollinators, soil organisms. Maintain biodiversity. •Moderate weather extremes and impacts.
STREAM	 Source of water for village	Major natural source of water for village.  Crematorium along the stream	Flowing from the hilly terrain.	Flowing stream provide the water for domestic and agricultural purposes.	Vegetation along the stream support biodiversity.	•Source of water for village. •Protecting watershed for downstream irrigation and water supply installations.	•Gives visual pleasure. •Rhythmic sound set the moot and gives listening pleasure.	•After cremation rituals are carried out along the stream.	Support variety flora and fauna.

ANALYSIS OF OPEN SPACES IN THE VILLAGE MANDEDE, MULSHI, PUNE

TYPES OF OPEN SPACES	VISUALS	ACTIVITY	NATURAL ELEMENTS ASSOCIATED WITH OPEN SPACES			VALUES ASSOIATED WITH OPEN SPACES			
			LAND	WATER	VEGETATION	FUNCTIONAL	AESTHETIC	SOCIOCULTURAL	ECOLOGICAL
AGRICULTURAL FEILDS	 Rice Farms and Mango Plantation	•Farming is the basic source of livelihood. •Agricultural fields are taken by outsiders for developing the farmhouses.	•Village settlements are surrounded by agricultural fields. •Few farmhouses are maintained and in use and others are not maintain and lands are barren.	•Wells constructed along the stream supports the farming .	•Mango is the money giving crop in the village which is the source to fulfilled the need of other food grains by mode of exchange. •Other crop cultivated in the village is rice which is dependent on rain water.	•Source of food and timber.	•Varied shades of green gives visual pleasure. •Natural surroundings relieves work stress.	• when food grains (any product from the farm) are prepared from the farms, it is offered to the village goddess in gratitude and then it is taken to soil.	•Temperature moderation. •Use of pesticides in the farm degrade the soil and water quality. •Harmful for wild life. •Change in land use affect the ecosystem.
TEMPLE AND ITS PREMISES	 Ram-Krishna mandir in Dhumal Wadi.  Ram Mandir in Ramwadi	Religious and cultural activities are carried out in the temple and its premises. Ex. Reading of religious scripture for a week on Ramnavamee. Fair is held in the premises of temple of Goddess Khairai on the birthday of lord Hanuman.	Temples are located in the settlements which are divided in six divisions.	-	Mango trees and trees with good canopy are seen in the temple premises.	•Place for religious and cultural activities.	•Gives visual pleasure. •Rhythmic sound set the moot and gives listening pleasure.	•Facilitates the community gathering through religious and cultural activities and help to enhance the social bonding. •Through these activity traditional local rituals and social customs are forwarded to the next generation.	Religious beliefs associated with natural elements helps in their conservation.

3.2.8 ANALYSIS OF OPEN SPACES IN THE VILLAGE MANDEDE, MULSHI, PUNE

TYPES OF OPEN SPACES	VISUALS	ACTIVITY	NATURAL ELEMENTS ASSOCIATED WITH OPEN SPACES			VALUES ASSOIATED WITH OPEN SPACES			
			LAND	WATER	VEGETATION	FUNCTIONAL	AESTHETIC	SOCICCULTURAL	ECOLOGICAL
SCHOOL GROUNDS	 Primary school in Ramwadi have ground for PT and play  Primary school in Dhumal Wadi do not have playground.	PT. and prayer is conducted on the ground. Children enjoy playing on ground before school and in the recess.	-School ground is a rammed earth and enclosed by compound wall and surrounded by natural vegetation	-School have Grampancha yat water connection	-Schools are surrounded by natural vegetation	-School grounds provides play area without equipment to explore various games and contributes to the physical development.	-School ground are surrounded by natural settings which relieves the stress and set the mood.	- Earthon ground with natural surrounding provide a space for children to explore various games, space for interaction sharing which helps to socialize.	Earthon grounds surrounded by natural environment with minimum human intervention does not creates any bad impacts on ecosystem.
MAIN ROADS, INERNAL LANES AND PATHWAYS	  Road to Mandede  Pathways within the settlement	Connectivity and movement  Pathway to the settlements 	Linkages on hilly terrain creates interest.	Stream along the road with vegetation.	Roads are adorn by road side mango plantation and agricultural fields	Road facilitate the pedestrian and vehicular movement in the village and to the surrounding villages and Pune city	Curvilinear roads on the hilly terrain creates interest in the movement	Roads and pathways connects the settlements which are dispersed in six divisions which provide the scope of interaction and information, helps to enhance social bonding.	External road is of tar otherwise all other internal linkages are of soil creating minimum impacts on natural surrounding.

4. Inferrences

- Scale and Typology of Open Spaces

Variation in scale of open spaces is observed (chawadi/ panchayat to river and river bank, school ground to hills and hill slopes). Villages have various types of open spaces most of which are enriched by natural elements with minimum /without human intervention. Usage and user group of these open spaces changes as per time in a day.

Activity pattern in the villages is governed by the type of open space, its location in the village and its usage.

- Association with Natural Element

Indigenous people/villagers still basically rely on wild and traditionally cultivated plant species to supply their needs in terms of food, fibre, fuel wood, wood for houses, medicinal plant etc.

Mountains/hills and their vegetation surrounding the villages provide water and soil to the villages and also contributes to pollution control and climate stabilisation by carbon sequestration. (Carbon sequestration refers to the provision of long term storage of carbon in the terrestrial

communities/ecosystem so that carbon dioxide build up in the atmosphere gets reduced or slows down)

- **Relationship with Culture**

In village culture species and nature have inspired songs, superstitious beliefs, stories and folktales, dance and drama, poetry, traditional crafts, local rituals, names of places and even family names.

In the villages, behaviour of species (flora and fauna) gives villagers an important indication of events that are of social, environmental or agricultural significance. eg. If insect Murugan is seen then it is considered as vehicle of the God Murugan and it indicates that it will rain soon.

- Landscape Treatment and Material

Special thought or efforts are not given for the landscape development of open spaces. Locally available materials are used for landscape treatment.

eg. Stones are used for constructing tree pit/chawadi, bund in the field, retaining wall etc.

- **Threats**

Replacement of indigenous varieties of crop species with new hybrids that are higher yielding but less resistant to pests, local conditions and need more fertilisers. Fertilisers, pesticides used in agricultural fields degrade the soil and water resources by sedimentation. It is also harmful to many wild animals.

As many villages are enrich by natural surroundings, people from the nearby cities invests in land as a site for development schemes for human settlements, it changes the land use. It destroys the existing ecosystem. Changes in land use changes the level of atmospheric carbon dioxide which cause the climate change followed by invasive species and air pollution.

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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
2020-21	
1	Historic Villages: Bridging The Gap Between Past And Present: Toka, Newasa Tahsil, Ahemadnagar" Architectural Research
2	Landscape Approach For Attracting Birds At Residential Yard At Shrirampur Taluka, Ahemadnagar District, Maharashtra.

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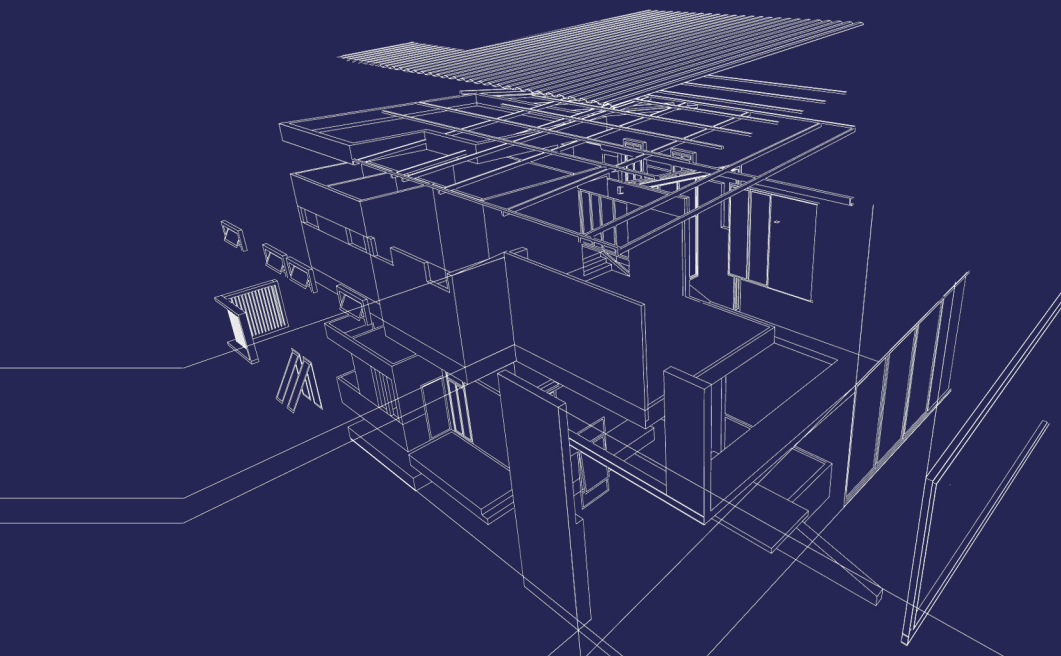

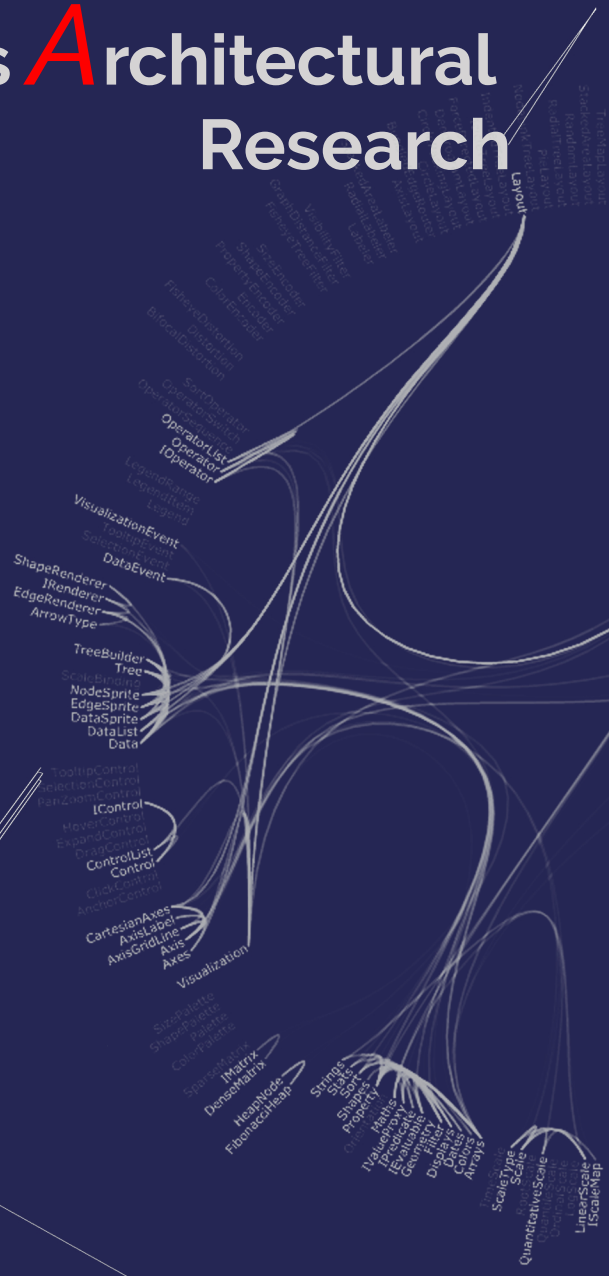

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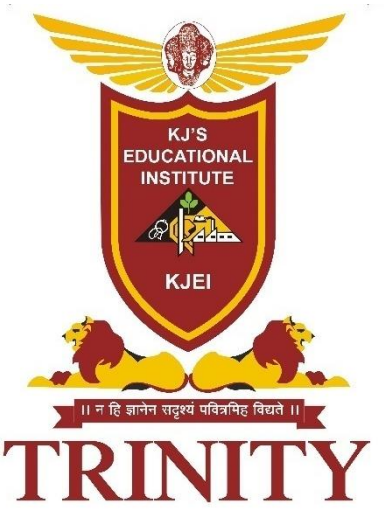

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Table of Content

HISTORIC VILLAGES: BRIDGING THE GAP BETWEEN PAST AND PRESENT: TOKA, NEWASA TAHSIL, AHEMADNAGAR

Ar. Dipeeka Hivarkar - Arbatti
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Abstract.

India is country of villages , as compare to cities, every village is distinct in its character, in terms of Setting, communities, Nature, Culture, Heritage, History. This means all the roots of our history and tradition could be found in village areas. Term historic village refers to the village which is named after certain mythological and historic incidences , which are having ruins or actual examples of Architectural structures, where people have strong association with past myths ,beliefs and rituals. All these sentiments attached with particular place make it very unique in character. This paper is aiming to find out the potential areas for development of the historic village Toka,Newasa tahsil , District - Ahemadnagar. Methodology of this study is conducted through Literature Study and interview method. Study is limited to group of temples of Toka- Pravara sangam. This study would throw light on hidden history of villages and conservation of historic and religious structures. This could also be helpful for developing districts tourism profile and employment opportunities will be raised. Bridging The Gap Between Past And present by developing and conserving such villages will be strengthening foundations for developing forgotten villages.

Keywords: *Historic Village, Temple Architecture, Heritage, Conservation*

Introduction

Ahemadnagar district is very well known for Religious tourism. Newasa is Tahsil in the district known for its religious and mythological importance. It is also important place as confluence of holy river Godavari and Pravara. This paper is focusing on the place where lord Ram killed Marich is now a village called Toka named after the arrow which Lord Rama used to kill Marich. This holy village is situated on the confluence of Pravars and Godavari Rivers. Significance of this village is temples of God Shiva dedicated to Siddheshwar, Ghateshwar, Sangameshwar and Gangamata in Hemadpanti style. (Maharashtra State Gazetteers: Ahmednagar)

1.1 Aim

Value assessment of the *Peshwekalin group of temples* situated in the village Toka, Newasa Tahsil, Ahemadnagar

1.2 Objectives

To study religious tourism and historic tourism of Newasa Tahsil, District- Ahemdnagar

1. To study the significance and importance of village of Toka Pravara Sangam and surrounding villages in Newasa Tahsil, Ahemdnagar
2. To study group of Shiva temples and temple premises present on the conflict of rivers Pravara and Godavari

1.3 Study Area

Figure 1:Map Of India showing position of Maharashtra

Figure 2:Map Of Maharashtra showing position of Ahemdnagar District

Figure 3: Map Of Ahemdnagar District showing position of Newasa Tahsil

Figure 4: Macro scale Image showing confluence of rivers Pravar and Godavari ,nearby religious places and temples.

Figure 5: Micro scale Image showing confluence of rivers Pravar and Godavari at village Toka and five group of historic Shiva temples.

Figure 6:Siddheshwar

Figure7:Mukteshwar

Figure 8:Ghateshwar

Figure 9:Gautmeshwar

Figure 10:Sangmeshwar

2. Literature Review and Inferences

Table 1. Mythological Significance and historic temples Of Nearby Villages.

No	Village/ Temple	Mythological Significance	Belifes And Facts	Historic Temples
1	Newasa	Newasa is having great cultural heritage of 'Paiss Khamb' (Dnayaneshwar) temple, in the 12th century.'5The early historical period is represented at Newasa. It was a great trading centre having business relations with distant places including Rome. (Gupta) Newasa an ancient 'Nidhivas' the name itself suggests that it was a place of rich people. 'Saint Dnyaneshwar wrote a Dananeshwari in Newasa beside a pole which is still there. (VAIDYA) Newasa is also famous as sasurvadi (in laws) of Lord Khandoba, The First wife of Lord Khandoba is from Newasa bk name Mahalasa so khandoba is called Mhalasakant	When the sea was churned to get nectar, Lord Vishnu appeared in the form of Mohini(a beautiful and enchanting damsel) to distract the demons and deprive them of nectar. The demons stared at Mohini while Lord Vishnu distributed nectar to the gods and water to demons. (VAIDYA) -Also part of this area is called Dandakaranya. -The remains of a multilevel settlement dating from the Paleolithic period to the Middle Ages have been discovered at Navasa.	Mohiniraj Temple Saint Dnyaneshwar Paiss Khamb AD 1290 (Hasmukhlal Dhirajlal Sankalia)
2	Moryachinchore	Moryachinchore is a famous village in Newasa Tahsil. The More dynasty ruled the village for about 2,000 years.		A royal temple of the More dynasty is Pohahicha Mahadev.

3	Toka - Pravara Sangam	Toka is The Border of The Great Maratha dynasty near Godavari River where Pravara meets Godavari River is Toka . The old village is recognized as a holy place and has many small temples. The construction of these temples is in *Hemadpanti* style.	The place where Lord Ram killed Marich is now a village called Toka named after the arrow which Lord Rama used to kill Marich.	*Siddheshwar Temple Ghateshwar Temple , Sangameshwar Temple , Ghateshwar Temple , Gautameshwar temple* *Gangamata Temple* near the confluence of *Pravars* and *Godavari* Rivers. (Hasmukhlal Dhirajlal Sankalia)

Inferences: There are potential villages and historic temples in the selected study area and nearby.

Table 2. Values associated with village Toka.

No	Area	Heritage Value	Religious Value	Socio Cultural Value	Environmental Value	Inference
1	Pravara Godavari Confluence Ghatsz	Five group of Hemadpanthi temples are situated on the Confluence of river.	All after death rituals are held on Confluence of river.	Mahashivratri is the main festival. At that time 50 to 60 thousand pilgrims attend thefair. The main items of entertainment at the fair are folk dramas, swings, circus, magic feats,touring theaters etc. The programs of Kirtan, Bhajan, Pravachan, Kathas are also attended bythe pilgrims at night.	Confluence areas of rivers are very important ecologically hence they are rich in flora and fauna . It has not geven attention in this case.	Pravara Godavari Confluence Ghats are having all the values and enviromental value at risk hence, high need of conservation and development.

2	Siddheshwar Temple	The beautifully carved temple portrays various mythological themes like Ramayana & Mahabharata and elegantly carvings of God & Goddesses. Presently in good condition.	There are temples dedicated to Durga Devi, Maruti, Ganesh, Dattatraya and Lord Vishnu Within the compound of the main temple.	Mahashivratri is the main festival. At that time 50 to 60 thousand pilgrims attend the fair.	The dumps from recently completed renovation of temple has been dumped near the temple premises which is disturbing the environment and ecology.	Temple is having all the values attached with it and environmenta l value is at higher risk hence, high need of conservation and development.
3	Mukteshwar	Situated in the river. No major carvings.	Kachan mruga which was killed by shri prabhuramc handra on this point and he got sadgati over here hence this temple is known as mukteswar	Main festival celebrated is mahashivratri. Many times pilgrims cant visit to the temple due to water levels.	Temple gets under the river water during many days of years.	Due to under river water most of the time, it has very less human interfearance however it is difficult to access.
4	Ghateshwar	Haphazard growing vegetation on shrine is affecting life span of structure.	Ghateshwar temple is believed to have been built at the place where the urn of amrita which was churned out of the sea by gods and demons was deposited.	Mahashivratri is the main festival. At that time 50 to 60 thousand pilgrims attend the fair.	Temple primises is highly paved wich is absorbing more heat.	Historic value and environmenta l values are at high risk, hence, there is High need of conservation and attention.

5	Gautameshwar	Situated almost in the river. One of the oldest shrine but getting neglected due to accessibility issue.	Temple of Shiva	Mahashivratri is the main festival. At that time 50 to 60 thousand pilgrims attend the fair.	Temple is surrounded by water on its three sides. River is getting dilapeated due to human intervention. Temple entrace has become dumpyard.	Religious and socio cultural activities are still happening though, Historic and environmental values are in the greater risk, hence, there is High need of conservation and attention.
6	Sangameshwar	The temple belongs to the period of the Peshwas as per the Devanagari inscriptions. It is on the verge of collapsing condition due to negligence	Temple of Shiva.	Mahashivratri is the main festival. At that time 50 to 60 thousand pilgrims attend the fair.	Haphazard growing vegetation on built structure is affecting life span of structure.	At very higher risk

Values at greater Risk Values at low Risk

Conclusions

The above study prooves that,the values associated with the study area, which includes major potential historic villages, various temples in villages, five group of hemadpanthi temples at Pravara Sangam are at very high risk. The whole area around the village Pravara Sangam along with village Kaygaon Toka, Newasa can form a strong historic village belt, which will be helpful for strenthening roots of heritage rooted in villages and bridging the gap between past and present by conserving the monuments and development of these historic villages. This will also strenthen the religious tourism of the area and new opportunities of income generartion could be initiated.

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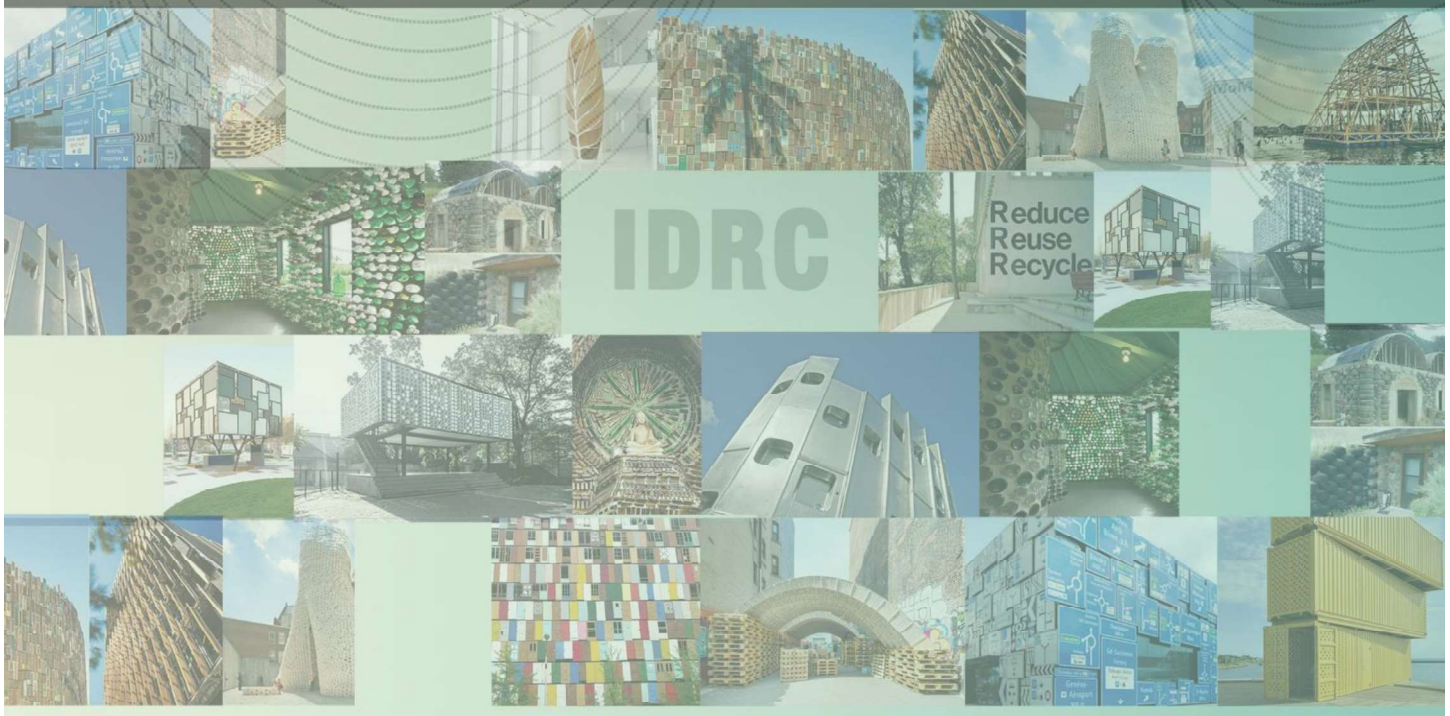

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LANDSCAPE APPROACH FOR ATTRACTING BIRDS AT RESIDENTIAL YARD AT SHRIRAMPUR TALUKA, AHEMADNAGAR DISTRICT, MAHARASHTRA.

Ar. Dipeeka Rahul Arbatti, Landscape Architect, Assistant Professor,
Pravara Rural College of Architecture, Loni, deepikaarbatti03@gmail.com

Abstract: Landscape approach for attracting birds at residential yard is micro level site development and could be treated as a prototype for development of residential landscapes. This study is aiming to derive planting policy Guidelines and Policy for developing habitat patches at residential yard for attracting birds at residential yard. Objectives of study are to collect information about habitat, behavior and ecology , by conducting live case study and synthesis of how spotted birds respond to existing landscape and habitats of residential yard. Methodology would be conducted through Literature review and live case study. From the above study it is found that, Total 26 types of birds were spotted and observed in live case study for five months , from March to July. 10 Insectivorous, 5 Fructivorous, 4 Granivorous, 2 Nectivorous, 3 Carnivorus, 2 Omnivorus birds are observed in this study. Molluscivorous, Mucivorous, Ophiophagous, Palynivorous, Piscivorous birds are not found in the case study. From this study it is concluded that, food, water ,Shelter , Mates for Nesting and Reproduction are main components for attracting birds at any landscapes. Patches of woodlands and grasslands along with water feature are extremely important for attracting insectivorous and Fructivorous birds. Flowering shrubs and ground covers are important for attracting Granivorous and Nectivorous birds. Huge trees are recommended for attracting Omnivores, Avivorous And Carnivorous birds.

Keywords: *Landscape Approach, Habitat Enhancement, Birds, Residential Yard.*

INTRODUCTION / BACKGROUND

Residential yard landscapes are micro level site developments, when we talk about enhancement of habitat and fauna. The role of landscape architect in this research is to understand birds association with different group of birds and propose the planting policy accordingly. This research would be particularly talking about Bird Species and their association with various plant typology. In this study spotted Birds are first classified into groups, based on their food habits and their sizes (Length) and then observed based on certain parameters. From literature study it is found that, researchers and Very few landscape architects have worked for habitat enhancement of birds at Macro scale and Regional scale. Micro level habitat enhancement by using apt planting policy is very important stage, before going for Macro scale and Regional scale, which every landscape architect must consider while designing Residential landscape yards. Hence, This research is needed.

AIM / PURPOSE : To derive planting policy Guidelines and Policy for developing habitat patches for attracting birds at residential yard.

Objectives:

1. To collect information of different Habitat of Birds
2. To collect information of Classification of birds based of food habit
3. To select a live case study of a residential yard.
4. To collect information about habitat, behavior and ecology , Relationship with human of bird spotted at residential yard.
5. To synthesis how spotted birds respond to existing landscape of residential yard.

Scope:

Habitat development starts from micro scale like balconies, Terrace gardens, residential yards landscape patches. Scope of this research is focusing on Insectivorous, Fructivorous, Granivorous, Nectivorous, Carnivorus, Omnivorus and Avivorous bird types, which belongs to different habitats were spotted during live case study. This study was conducted for five months at residential yard by observation method. This research will discuss about distribution and habitat, relationship with human and plants of the birds spotted during study. This research is site specific which comes under western Maharashtra.

Limitation:

This study will not focus on urban scale or regional scale habitat enhancement landscape approach.

Research question:

How landscape approach of residential yards is important for attracting birds and their habitat enhancement ?

RESEARCH METHODOLOGY

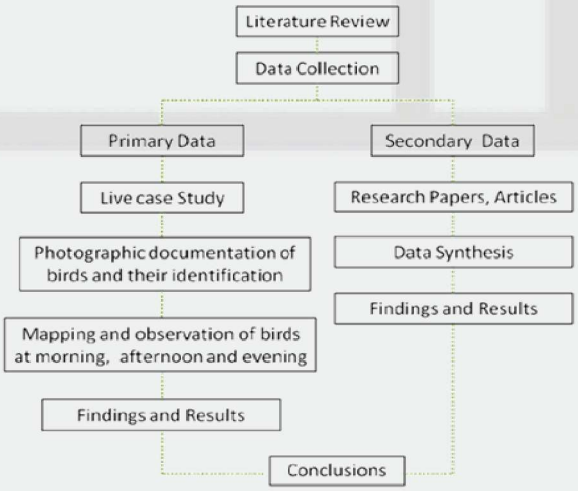

Chart No 1: Showing Methodology

FINDINGS: Information About Spotted Birds.

1. Coppersmith Barbet : (6 inches Small) **- Food:** Banyan, Peepal, And Other Wild Figs, Various Drupes And Berries, And The Occasional Insect, Caught In Aerial Sallies. It Also Feeds On Flower Petals. **Habitat :** Gardens, Groves And Sparse Woodland. Habitats With Dead Wood Suitable For Excavation Of Nests Are Important. (Mitchell Waite, 2002-2008)

2. Red-Vented Bulbul: (8.25 inches Small) **- Food:** Eats Fruit, Flower Buds, And Insects. **Habitat :** High In Trees Or Perched On Wires In Urban And Rural Areas; Generally Prefers Scrubby Edge Habitat Instead Of Dense Forest. (Mitchell Waite, 2002-2008) (Kasambe, May 2017)

3.Common Iora : (4.5–6.1 in Small) **- Food:** Insects Such As Grasshoppers, Caterpillars, Dragonflies And Mantises. It Also Consumes Spiders And Small Insects, Fruit, Berries And Nectar. **Habitat :** Acacia Scrub, Forest Edge, And Closed Forests, As Well As Agricultural Land And (In The Common Iora) Gardens (Mitchell Waite, 2002-2008) (Kasambe, May 2017)

4. Brahminy Starling:(8-8 Inch Small) - **Food:** Fruit And Insects. Dry Forest, Scrub Jungle And Cultivation And Is Often Found Close To Human Habitations. They Especially Favor Areas With Waterlogged Or Marshy Lands. (Mitchell Waite, 2002-2008)

5. Asian Koel: (15–18 in Large) - **Food:** Variety Of Insects, Caterpillars, Eggs And Small Vertebrates. Adults Feed Mainly On Fruit. **Habitat :**Light Woodland And Cultivation. (Mitchell Waite, 2002-2008) (Kasambe, May 2017)

6. Laughing Dove: (9.8 in Medium) - **Food:** Fallen Seeds, Mainly Of Grasses, Other Vegetable Matter. **Habitat :**Grasslands And Cultivation. (Mitchell Waite, 2002-2008)

7. Scaly Breasted Munia: (4.3–4.7 in Very Small) - **Food:**Grass Seeds Apart From Berries And Small Insects. **Habitat :**Tropical Plains And Grasslands. (Mitchell Waite, 2002-2008) (Kasambe, May 2017)

8. Parakeets : (12 inches Medium) - **Food:**Including Seeds Of Spinifex, Mitchell's And Tussock's Grasses, Wild Oats And Canary Grass. They Also Eat Wild Millet And Farm Crops Such As Wheat. During The Rainy Season, They Search For Newly Sprouted Green Grasses. **Habitat :** Desert, Woodlands, Grasslands And Open Scrub Far From The Densely Populated Cities (Mitchell Waite, 2002-2008)

9. White-Breasted Waterhen: (13-13 Inch Medium) - **Food:** Insects, Spiders, Grain, Fish, Worms And Snails, And Some Parts, Shoots And Roots, Of Marsh Plants. **Habitat :** Near Freshwater Marshes And In Habitats With Dense Undergrowth. It Is Very Common In Mangroves, Reed beds, Grasslands, Rice fields, Orchards, Parks And Gardens. Found Near Small Streams And Pools Where There Is Dense Vegetation. (Mitchell Waite, 2002-2008) (Kasambe, May 2017) (Kasambe, May 2017) (Mayntz, 2019)

10. Greater Coucal Or Crow Pheasant: (19 inches Large) - **Food:** Insects, Caterpillars And Small Vertebrates Such As The Saw-Scaled Vipers. They Are Also Known To Eat Bird Eggs, Nestlings, Fruits And Seeds. **Habitat :** Jungle To Cultivation And Urban Gardens. (Mitchell Waite, 2002-2008)

11. Green Bee-Eater: (9-11 inches Medium) - **Food:** Insects, Especially Bees, Wasps And Ants, Which Are Caught In The Air By Sorties From An Open Perch. **Habitat :**Open Country With Bushes. (Mitchell Waite, 2002-2008)

12. Black Drongo : (13-inch Medium) - **Food:** Insects Such As Grasshoppers, Cicadas Termites, Wasps, Bees, Ants, Moths, Beetles And Dragonflies. They Sometimes Fly Close To Tree Branches, Attempting To Disturb Any Insects That May Be Present. **Habitat :** Savanna, Fields, And Urban Habitats (Mitchell Waite, 2002-2008) (Kasambe, May 2017)

13. White-Browed Fantail: (6- 8in Small) - **Food:**Small Insects And Invertebrates. **Habitat :** Forest And Other Woodland. (Mitchell Waite, 2002-2008) (Mayntz, 2019)

14. Indian Paradiase Flycatcher: (7.5–8.7 in Small) - **Food:** Insects, Which They Capture In The Air Often Below A Densely Canopied Tree. **Habitat :** Thick Forests And Well-Wooded Habitats (Mitchell Waite, 2002-2008)

15. Magpie Robins: (7 in Small) - **Food:** Insects And Other Invertebrates. Known To Occasionally Take Flower Nectar, Geckos, Leeches, Centipedes And Even Fish. **Habitat :** Open Woodland, Cultivated Areas Often Close To Human Habitations. They Prefer Open Areas Such As Mangroves, Gardens, Cultivated Areas. (Mitchell Waite, 2002-2008)

16. Large Grey Babblers : (11-11 Inch Medium) - **Food:** Insects Of Which Grasshoppers, Caterpillars. Beetles And Ants Were Taken In Significant Quantities. **Habitat :** They Are Locally Common In The Scrub, Open Forest And Garden land (Mitchell Waite, 2002-2008) (Kasambe, May 2017)

17. Ashy Prinia: (9 inches Small) - **Food:** Insects **Habitat :** Dry Open Grass Land, Open Woodland, Scrub And In Home Gardens In Many Cities. Usually It Is Seen Clambering About Or Hopping On The Ground. (Mitchell Waite, 2002-2008)

18. Red Watteled Lapwing : (13-14 Inch Medium) **- Food:** Insects, Snails And Other Invertebrates, Mostly Picked From The Ground. They May Also Feed On Some Grains. They Feed Mainly During The Day But They May Also Feed At Night. **Habitat :** Well-Watered Open Country, Ploughed Fields, Grazing Land, And Margins And Dry Beds Of Tanks And Puddles. Also Found In Forest Clearings Around Rain-Filled Depressions. (Mitchell Waite, 2002-2008) (Kasambe, May 2017)

19. Common Tailorbird: (3.9 to 5.5 in Small) **- Food:** A Mixture Of Caterpillars (Top) (And Other Worm Like Invertebrates) And Many Different Insects – Small Crickets (Second Row, Right), Spiders (Third Row, Left), Etc. No Vegetable Matter. **Habitat :** Open Farmland, Scrub, Forest Edges And Gardens. (Mitchell Waite, 2002-2008)

20. Purple-Rumped Sunbird : (4 inches Very Small) **- Food:** Nectar But Sometimes Take Insects. **Habitat :** Disturbed Secondary Forest, Open Woodland, Open Scrub And Savannah, Coastal Scrub And Alpine Forest. (Mitchell Waite, 2002-2008) (Kasambe, May 2017)

21. Purple-Sunbird: (4 inches Very Small) **- Food:** Nectar But Sometimes Take Insects. **Habitat :** Disturbed Secondary Forest, Open Woodland, Open Scrub And Savannah, Coastal Scrub And Alpine Forest. (Mitchell Waite, 2002-2008)

22. Carrion : (22 inches Large) **- Food:** insects, earthworms, grain, fruits, seeds, small mammals, amphibians, scraps ,eggs. **Habitat :**Near areas of human activity or habitation including cities, moors, woodland, sea cliffs and farmland (Mitchell Waite, 2002-2008)

23. Crested Myna: (9.5 - 10.2 inches Medium) **- Food:** Worms, Grubs, Grains, Fruit, And Even Garbage. It Is A Highly Beneficial Bird To Farmers, As It Feeds On Insects And Does Not Attack Crops. **Habitat :** Urban To Rural Areas. In Cities, In The Eaves Of Buildings, Along Roads And Alleys, Near Gardens And Parks, In Parking Lots. It Can Be Found Under Bridges, In Trees, In Chimneys, And On Roofs. (Mitchell Waite, 2002-2008) (Kasambe, May 2017)

24. Asian Koel: (18 to 24 in Large) **- Food:** Variety Of Insects, Caterpillars, Eggs And Small Vertebrates. Adults Feed Mainly On Fruit. **Habitat :** Light Woodland And Cultivation. (Mitchell Waite, 2002-2008)

25. Shikra : (10-12 inches Medium) **- Food:** Reptiles, Small Mammals, Small Birds, Frogs And Insects. **Habitat :** Forests, Deciduous Woodland, Plains, Farmlands, Savanna, Arid Steppe And Urban Areas. (Mitchell Waite, 2002-2008)

26. Hawk: (18 to 24 in Large) **- Food:** Smaller Animals Some Of These Small Animals Include Snakes, Lizards, Fish, Mice, Rabbits, Squirrels, Birds, And Any Other Type Of Small Game That Is Found On The Ground. **Habitat :** Fields Or Deserts, With High Perching Places Nearby From Which They Can Watch For Prey. Adaptable And Also Dwell In Mountains And Tropical Rain Forests. (Mitchell Waite, 2002-2008) (Kasambe, May 2017)

27. White Throated Kingfisher : (10.6–11.0 in Medium) **- Food:** Fish, Frogs And Other Amphibians, Annelid Worms, Molluscs, Insects, Spiders, Centipedes, Reptiles (Including Snakes), And Even Birds And Mammals. **Habitat :** They Are Found In Wetlands And On The Shores Streams, Ponds And Lakes. (Mayntz, 2019)

ANALYSIS:

A. VERY SMALL (3 - 5 in) TYPE A

TYPOLOGY	VERY SMALL (3 - 5 in) TYPE A		
No	1	2	3
BIRD NAME	**Scaly Breasted Munia**	**Purple-Rumped Sunbird**	**Purple-Sunbird**

PARAMETERS	Food Type	Granivore	Nectivore	Nectivore
	Month	March-July	March-July	March-July
	Time	Evening	Morning , Afternoon, Evening	Morning , Afternoon, Evening
	Season	Summer, Rain	Summer, Rain	Summer, Rain
	Ground Cover/ Ground	Spotted	Not Spotted	Not Spotted
	Shrub/ Bushes	Not Spotted	Spotted	Spotted
	Small fruit Tree	Not Spotted	Spotted	Spotted
	Small Flowering Tree	Spotted	Spotted	Spotted
	Big Fruit Trees	Spotted	Spotted	Spotted
	Big Trees(Non Flowering, Non Fruit Bearing)	Not Spotted	Spotted	Spotted
	Flowering Climber/Flowering Liana	Spotted	Spotted	Spotted
	Near Manmade Water Feature	Not Spotted	Not Spotted	Not Spotted
	On Built For/ Manmade Things	Spotted	Not Spotted	Not Spotted
	Human Friendly	Yes	Yes	Yes

Table No-1: Showing Analysis Of Very Small Birds (3 - 5 In) Type A

B. SMALL (5 - 9 in) -TYPE B

TYPOLOGY		SMALL (5 - 9 in) -TYPE B								
	No	1	2	3	4	5	6	7	8	9
	BIRD NAME	Coppersmith Barbet	Red-Vented Bulbul	Common Iora	Brahminy Starling	White-Browed Fantail	Indian Paradiase Flycatcher	Magpie-Robins	Ashy Prinia	Common Tailorbird
PARAMETERS	Food Type	Frugivorous	Frugivorous	Frugivorous	Frugivorous	Insectivorous	Insectivorous	Insectivorous	Insectivorous	Insectivorous
	Month	March-May	March-July	March-July	March-July	March-July	May-July	March-July	June-July	March-July
	Time	Evening	Morning , Afternoon, Evening	Morning Afternoon Evening	Evening	Afternoon, Evening	Evening	Morning , Afternoon, Evening	Morning Evening	Morning , Evening
	Season	Summer	Summer , Rain	Summer , Rain	Summer , Rain	Summer , Rain	Summer , Rain	Summer , Rain	Rain	Summer , Rain
	Ground Cover/ Ground	Not Spotted	Spotted	Not Spotted	Spotted	Spotted	Not Spotted	Spotted	Not Spotted	Not Spotted

	Shrub/ Bushes	Not Spotted	Spotted	Not Spotted	Spotted	Not Spotted	Spotted	Spotted	Spotted	Spotted
	Small fruit Tree	Not Spotted	Spotted	Spotted	Not Spotted	Spotted	Not Spotted	Spotted	Not Spotted	Spotted
	Small Flowering Tree	Not Spotted	Spotted	Not Spotted	Not Spotted	Not Spotted	Not Spotted	Not Spotted	Spotted	Spotted
	Big Fruit Trees	Spotted	Spotted	Spotted	Not Spotted	Spotted	Spotted	Spotted	Spotted	Spotted
	Big Trees(Non Flowering, Non Fruit Bearing)	Spotted	Spotted	Not Spotted	Spotted	Not Spotted	Spotted	Not Spotted	Not Spotted	Not Spotted
	Flowering Climber/Flowering Liana	Not Spotted	Not Spotted	Not Spotted	Not Spotted	Not Spotted	Not Spotted	Not Spotted	Spotted	Spotted
	Near Manmade Water Feature	Not Spotted	Spotted	Not Spotted	Spotted	Spotted	Not Spotted	Spotted	Not Spotted	Not Spotted
	On Built For/ Manmade Things	Not Spotted	Spotted	Not Spotted	Not Spotted	Not Spotted	Not Spotted	Spotted	Not Spotted	Not Spotted
	Human Friendly	Not Spotted	Yes	No	No	No	No	Yes	No	No

Table No-2 : Showing Analysis Of Small Birds (5 - 9 In) -Type B

C. MEDIUM (9 - 16 in) -TYPE C

TYPOLOGY		**MEDIUM (9 - 16 in) -TYPE C**									
No		1	2	3	4	5	6	7	8	9	10
BIRD NAME		**Laughing Dove**	**Parakeets**	**White-Breasted Waterhen**	**Green Bee-Eater**	**Black Drongo**	**Large Grey Babblers**	**Red Watteled Lapwing**	**Crested Myna**	**Shikra**	**White Throated Kingfisher**
PARAMETERS	**Food Type**	Granivore	Granivore	Granivore	Insectivorous	Insectivorous	Insectivorous	Insectivorous	Omnivores	Carnivorous	Carnivorous
	Month	March-July	March-July	March-July	March-July	March-July	March-July	March-July	March-July	June-July	March-July
	Time	Evening	Morning, Evening	Evening	Morning, Evening	Morning, Evening	Morning, Afternoon, Evening	Morning, Evening	Morning, Afternoon, Evening	Evening	Morning, Evening
	Season	Summer, Rain	Summer, Rain	Summer, Rain	Summer, Rain	Summer, Rain	Summer, Rain	Summer, Rain	Summer, Rain	Rain	Summer, Rain

	Ground Cover/ Ground	Spotted	Not Spotted	Spotted	Spotted	Not Spotted	Spotted	Spotted	Spotted	Not Spotted	Not Spotted
	Shrub/ Bushes	Not Spotted	Not Spotted	Spotted	Spotted	Not Spotted	Not Spotted	Not Spotted	Spotted	Not Spotted	Not Spotted
	Small fruit Tree	Not Spotted	Not Spotted	Not Spotted	Not Spotted	Spotted	Spotted	Not Spotted	Spotted	Not Spotted	Not Spotted
	Small Flowering Tree	Not Spotted	Not Spotted	Not Spotted	Not Spotted	Not Spotted	Spotted	Not Spotted	Not Spotted	Not Spotted	Not Spotted
	Big Fruit Trees	Not Spotted	Spotted	Not Spotted	Spotted	Spotted	Spotted	Not Spotted	Spotted	Spotted	Spotted
	Big Trees(Non Flowering, Non Fruit Bearing)	Not Spotted	Spotted	Not Spotted	Spotted	Spotted	Spotted	Not Spotted	Spotted	Spotted	Spotted
	Flowering Climber/Flowering Liana	Not Spotted	Not Spotted	Not Spotted	Not Spotted	Not Spotted	Not Spotted	Not Spotted	Not Spotted	Not Spotted	Not Spotted
	Near Manmade Water Feature	Spotted	Not Spotted	Spotted	Not Spotted	Not Spotted	Spotted	Not Spotted	Spotted	Not Spotted	Not Spotted
	On Built For/ Manmade Things	Spotted	Spotted	Spotted	Spotted	Spotted	Spotted	Not Spotted	Spotted	Not Spotted	Spotted
	Human Friendly	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No	No

Table No-3: Showing Analyasis Of Medium Birds (9 - 16 In) -Type C

D. LARGE (16 - 32 in) -TYPE D

TYPOLOGY		LARGE (16 - 32 in) -TYPE D			
No		1	2	3	4
BIRD NAME		Asian Koel	Greater Coucal Or Crow Pheasant	Carrion	Hawk
PARAMETERS	Food Type	Frugivorous	Insectivorous	Omnivores	Carnivorous
	Month	April-July	March-July	March-July	June-July
	Time	Afternoon, Evening	Morning , Afternoon, Evening	Afternoon	Evening
	Season	Summer, Rain	Summer, Rain	Summer, Rain	Rain
	Ground Cover/ Ground	Not Spotted	Spotted	Not Spotted	Not Spotted

	Shrub/ Bushes	Not Spotted	Spotted	Not Spotted	Not Spotted
	Small fruit Tree		Spotted	Not Spotted	Not Spotted
	Small Flowering Tree	Not Spotted	Not Spotted	Not Spotted	Not Spotted
	Big Fruit Trees	Spotted	Not Spotted	Spotted	Spotted
	Big Trees(Non Flowering, Non Fruit Bearing)	Spotted	Not Spotted	Spotted	Spotted
	Flowering Climber/Flowering Liana	Not Spotted	Not Spotted	Not Spotted	Not Spotted
	Near Manmade Water Feature	Not Spotted	Spotted	Spotted	Not Spotted
	On Built For/ Manmade Things	Not Spotted	Spotted	Spotted	Not Spotted
	Human Friendly	No	Yes	Yes	No

Table No-4: Showing Analyasis Of Large Birds (16 - 32 In) -Type D

1	TYPOLOGY		VERY SMALL (3 - 5 in) TYPE A	SMALL (5 - 9 in) -TYPE B	MEDIUM (9 - 16 in) -TYPE C	LARGE (16 - 32 in) -TYPE D	INFERENCE
2	TOTAL BIRD COUNT (26)		3	9	10	4	i. **VERY SMALL (3 - 5 in) TYPE A** : Found in landscape of residential yards are mostly nectivorous or **Granivore**. Prominantly seen on **Small Flowering Tree, Big Fruit Trees, Flowering Climber/Flowering Liana** in summer and rain, they are human friendly. ii. **SMALL (5 - 9 in) -TYPE B :** Found in landscape of residential yards are mostly Insectivorous or Frugivorous. Prominantly seen on **Shrub/ Bushes, Big Fruit Trees, Small fruit Trees** in summer and rain, very few of them are human friendly. iii. **MEDIUM (9 - 16 in) -TYPE C :** Found in landscape of residential yards are mostly Insectivorous , Frugivorous very few of them are Omnivores and Carnivorous. Prominantly seen on **Ground Cover/ Ground, Big Fruit Trees, Big Trees(Non**
	FOOD TYPE	Granivore	1	0	3	0	
3		Nectivore	2	0	0	0	
		Insectivorous	0	5	4	1	
		Omnivores	0	0	1	1	
		Carnivorous	0	0	2	1	
		Frugivorous	0	4	0	1	
	MONTH	March	3	8	9	2	
4		April	3	8	9	3	
		May	3	8	9	3	
		June	3	9	10	4	
		July	3	9	10	4	
	TIME	Morning	2	5	7	1	
5		Afternoon	2	4	2	3	
		Evening	3	9	10	3	
6	SEASON	Summer	3	9	9	3	
		Rain	3	9	10	4	
	PLANT TYPE	Ground Cover/ Ground	1	4	6	1	
		Shrub/ Bushes	2	6	3	1	
7		Small fruit Tree	2	5	3	1	
		Small Flowering Tree	3	3	1	0	
		Big Fruit Trees	3	8	7	3	
		Big Trees(Non Flowering, Non Fruit Bearing)	2	4	7	3	

		Flowering Climber/Flowering Liana	3	2	0	0	**Flowering, Non Fruit Bearing) , On Built For/ Manmade Things** in summer and rain, Most of them are human friendly.
8	ASSOCIATION WITH HUMAN	Near Manmade Water Feature	0	4	4	2	iv. **LARGE (16 - 32 in) -TYPE D :** Found in landscape of residential yards are mostly Insectivorous, Omnivores, Carnivorous, Frugivorous. Prominantly seen on **Big Fruit Trees, Big Trees(Non Flowering, Non Fruit Bearing)** in summer and rain, Few of them are human friendly.
		On Built For/ Manmade Things	1	2	8	2	
		Human Friendly	3	2	6	2	

Table No-5:Showing Summary of analysis and Inferences of study (i.e. Table No-2,3,4,5)

CONCLUSION:

Small Flowering Tree, Big Fruit Trees, Flowering Climber/Flowering Liana are recommended near human activity areas like seating, patios, gazebos, pavilions etc for attracting **very small size birds**, most of them are human friendly and could be found on lower canopy of vegetation. **Shrub/ Bushes, Big Fruit Trees, Small fruit Trees** are recommended near human activity areas like pathways , Water bodies , Windows , Near Balconies, terraces etc for attracting **small size birds**, As very few of them are human friendly and could be found on middle canopy of vegetation, hence difficult to notice. **Ground Cover/ Ground**, **Big Fruit Trees**, **Big Trees(Non Flowering, Non Fruit Bearing)** are recommended near human activity areas like seating, patios, gazebos, pavilions, Water bodies, Near Balconies, terraces etc for attracting **Medium size birds**, As most of them are human friendly and could be found on Uppecanopy of vegetation. **Big Fruit Trees, Big Trees(Non Flowering, Non Fruit Bearing)** are recommended near wall compounds , Avenues, Near Balconies, terraces, Window etc for attracting **Large size birds**.

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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
2019-20	
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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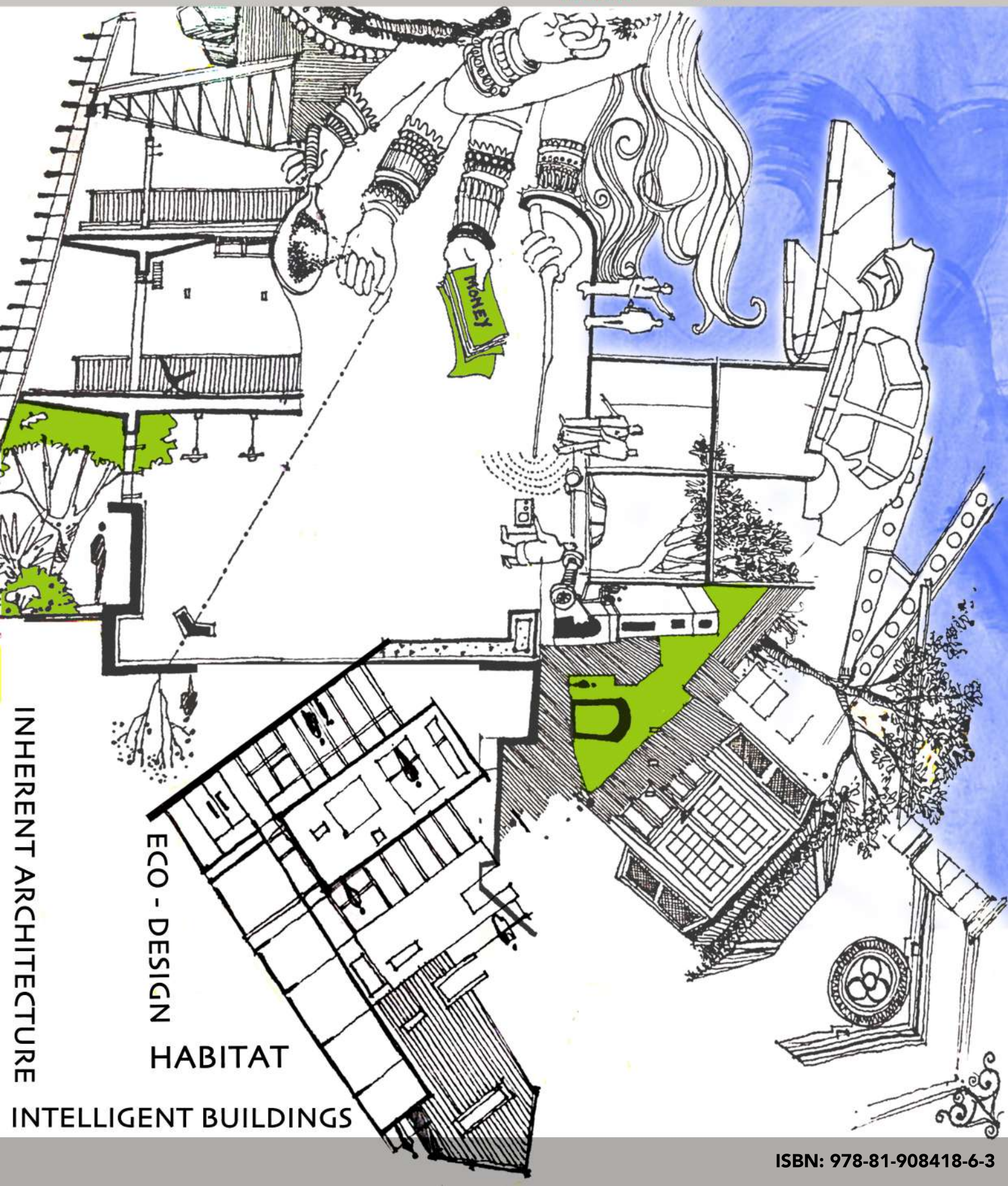

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Contents

Cultural Urban Forests: For Conservation of Culture

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Assistant Professor, Pravara Rural College Of Architecture, Loni, Ahemadnagar

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

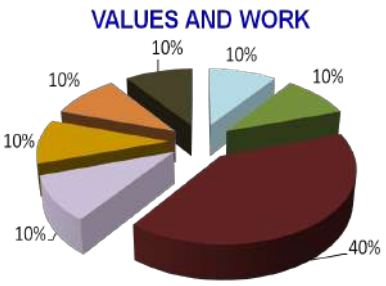
time to rebuilt neighborhood relationships and revival of our culture, through Landscape City Planning by bringing new concepts like CULTURAL URBAN FOREST! Due to westernization we are losing our culture and new generation is unaware of our traditions and culture. Hence developing Cultural Urban Forest 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	*Agni purana*	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	Manusmruti - 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%

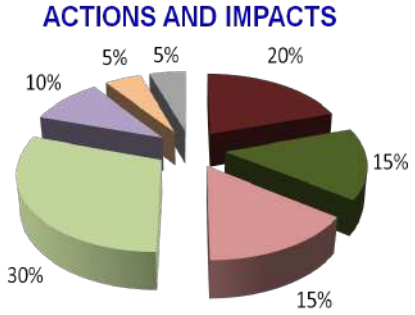


Above chronological study shows that, from Mughal Period Planning, Management And Conservation Of Forest Landscapes got DIMINISHED and trend of Garden Designing and beautification was emerged. Major Contribution in Landscape Planning on Ecological Values (Around 40% from above study) was covered During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

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

2.4 FINDINGS:

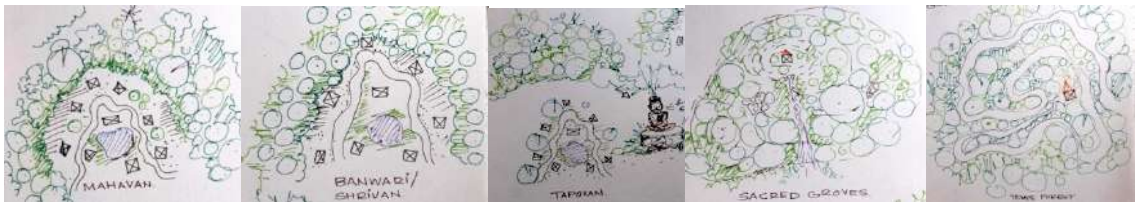
NNO	**British Rule**									**During world war - I**	**Post Independent Era**
	CHRONOLOGICAL ORDER FOR ACTIONS TAKEN										
CHRONOLOGICAL ORDER	11750-1947 A.D	1800	1806	1855	1865 to 1894	From 18th century	Between 1926 and 1947	In the early 1930s	1947	1952	1976
LEGEND	Deforestation (Total 20%)	Deforestation (Total 20%)	Afforastraion Of Monostands (Total 15%)	Afforastraion 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 wild life. (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%



In British period large number of forests were cut down (Around 20% from above study) 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 (Around 30% from above study) from British Rule to Post Independent Era.

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.

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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**	
	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. Also no village would be complete without its woodlands in and around the house. Every village must have a cluster of five great trees, *panchavati* symbolizing the five primary elements earth, water, fire, air and ether-the totality of everything.	Types of forest: ***i. Mahavan-*** great natural forest-Equivalent to protected areas of today.-It adjoins the village & provides a place where all species can coexist. ***ii. Banwari / Shrivan-*** 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). **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.
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	Ecological awareness i. Biodiversity means all living forms broadly ascribed as chara (movable living world) and achara (immovable: plant kingdom). ii. Pollution refers to spoilage of the five gross elements by unethical activity.

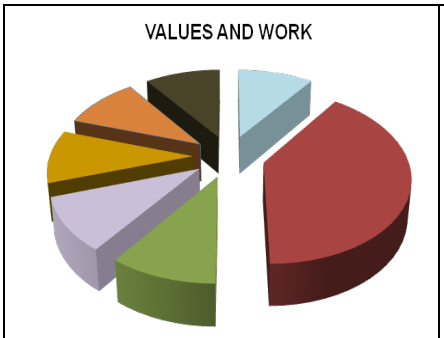
		iiii. Contamination refers to any action against wholesomeness (soucha)
d.	**Caraka-Samhita and Susruta-Samhita**	
	Charaka and Susrata classified lands according to the nature of the soil, climate and vegetation into three categories: i. Jangala, or the region of open spaces where a steady dry wind 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)

Agni purana	**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	Manusmruti - 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:



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

Actions And Impacts:

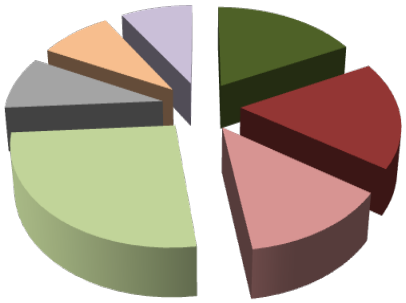
No	British Rule
1750-1947 A.D	i. Large numbers of trees such as the sal, teak, and sandalwood were cut for export. ii. The history of modern Indian forestry was a process by which the British gradually appropriated forest resources for revenue generation. iii. Trees were felled without any thought. iv. 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	i. A commissioner was appointed to look into the availability of teak in the Malabar forests.
1806	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	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**
	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	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	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	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
Actions Taken										
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:

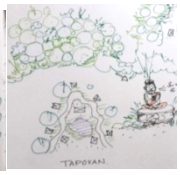
ACTIONS AND IMPACTS	
	In British period large number of forests were cut down for export of timber. Hence forest areas planted and conserved during Vedic and Indus valley diminished and religious, native species was replaced by monostands of tectona grandice. Major use of forests were for Imperial needs/Revenue generation from British Rule to Post Independent Era.

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.

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.

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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

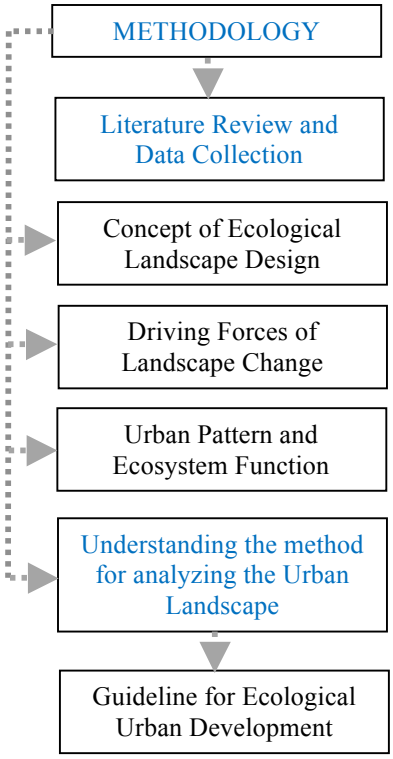


FIGURE1. RESEARCH METHODOLOGY

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.

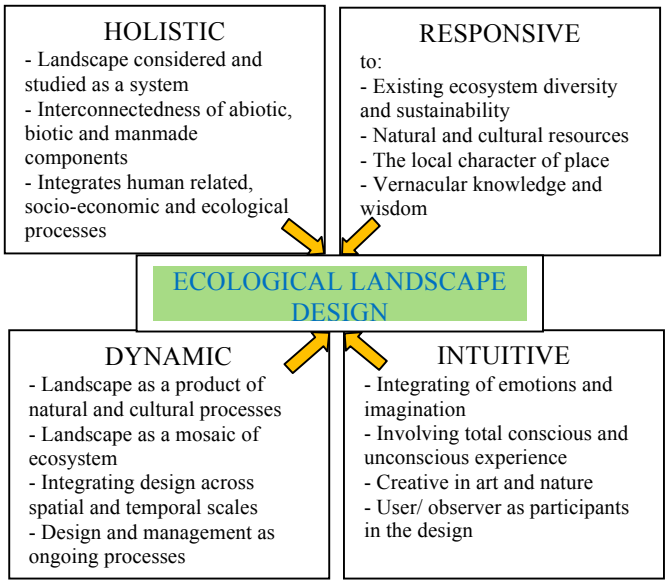


FIGURE2. ECOLOGICAL LANDSCAPE DESIGN APPROACH

2. 2. EFFECT OF URBAN PATTERN ON ECOSYSTEM FUNCTION

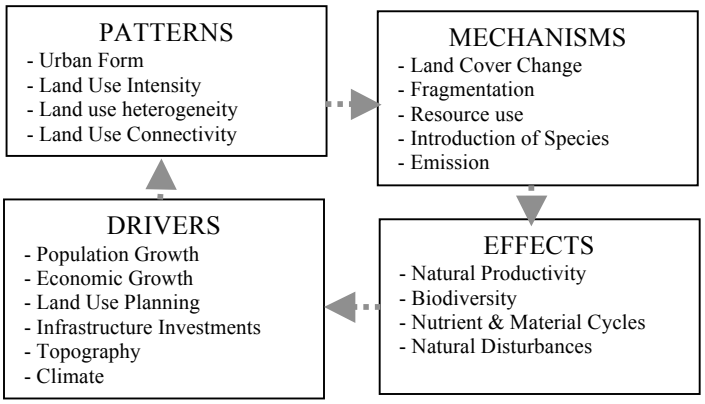
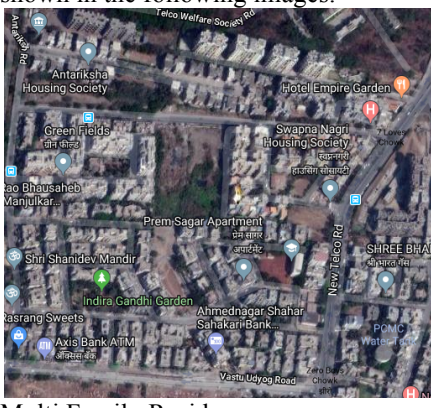


FIGURE3. EFFECT OF URBAN PATTERN ON ECOSYSTEM FUNCTION

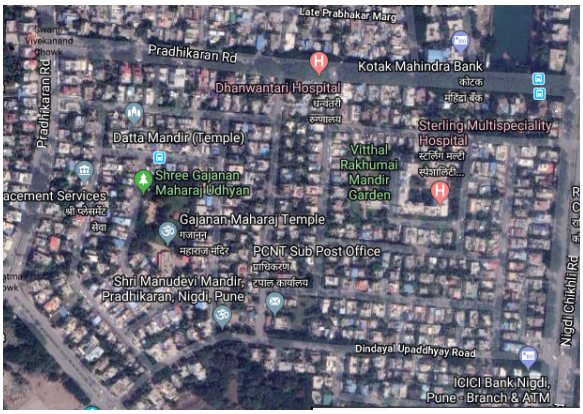
- Urban form refers to the degree of centralisation of the urban structure.
- Land-use intensity is the ratio of population to area
- Land-use heterogeneity indicates the diversity of functional land uses such as residential, commercial, industrial, institutional etc.
- Land-use connectivity measures 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

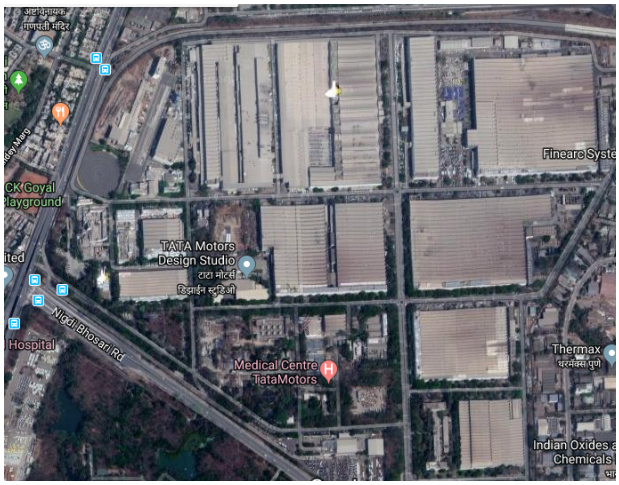
Pimpri – Chinchwad is situated in the sub urban region of Pune city. It has a population of 1.72 million residing in area of 181 square kilo meters. It is well known for its automotive and manufacturing industry.
Different land covers across different land use types are shown in the following images.



Multi Family Residence



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	**Urban Ecosystem**
- Energy consumption is less	- 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.

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Criteria 3 – Research, Innovations and Extension (110)

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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

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(SSC-18)

NATIONAL CONFERENCE ON

SMART AND SUSTAINABLE CITIES (SSC-18)

22-23 December, 2018

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Organised by

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CONTENTS

SESSION 5: CONSERVATION AND ENVIRONMENT

SESSION 6: TOURISM

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 Brutland 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

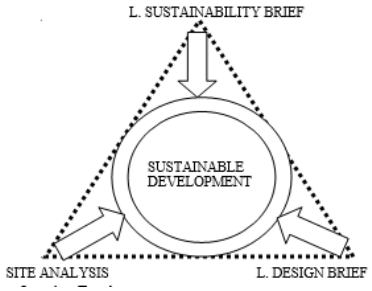
landscapes. Sustainable Landscape Development includes two broad schools – one focused on the design and protection of scenic assets and the other emphasizing dynamic multifunctional links between ecosystem services and human well being.

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			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

11	Water Curtain / Feature wall		Visual Pleasure	2 Nos6 M x 0.35M
12	Plantation Trees Shrubs Ground Cover	VEGETATION	Visual Pleasure	45000Sq.M.
13	Terrace Garden		Visual Pleasure	
14	Covered seating / Pavilions	OTHER	Seating, Relaxing, Waiting	
15	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
	11	Use of treated waste water (More than or equal to 50%)	Reduce use of Potable water
	12	Rain water harvesting from roof area (Minimum 50%)	Water conservation
VEGETATION	13	Protected existing vegetation	- Soil erosion control - Water quality - Micro climate - Aesthetics
	14	Plantation for soil stabilization	Soil erosion control
	15	Plantation for windbreaks and shelterbelts	Protection from Wind & Sun
	16	Plantation for pollution control	Microclimate moderation
	1	Productive	Economic
	7	vegetation	sustainability
	18	Roof / terrace garden (more than or equal to 50%)	Heat Island Effect
	19	Area under plantation	Heat Island Effect
	20	Drought resistant plantation (more than or equal to 20%)	Optimum use of natural resources
	21	Native plantation	Maintenance
	22	Water requirement for plantation	Water conservation
OTHER	23	Proximity of the site from public transit / household services and amenities (within 1 km)	Time, Fuel, Money consumption
OTHER	24	Use of compost manure (Treatment to domestic waste + landscape waster)	Optimum use of Natural Resources
	25	Use of Solar Lighting	Energy Conservation

Table 04: Landscape Management Framework at Pre-Execution Stage

LANSCAPE MANAGEMENT FRAMEWORK AT PRE EXECUTION STAGE			
Stages	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

LANSCAPE 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

LANSCAPE 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. .

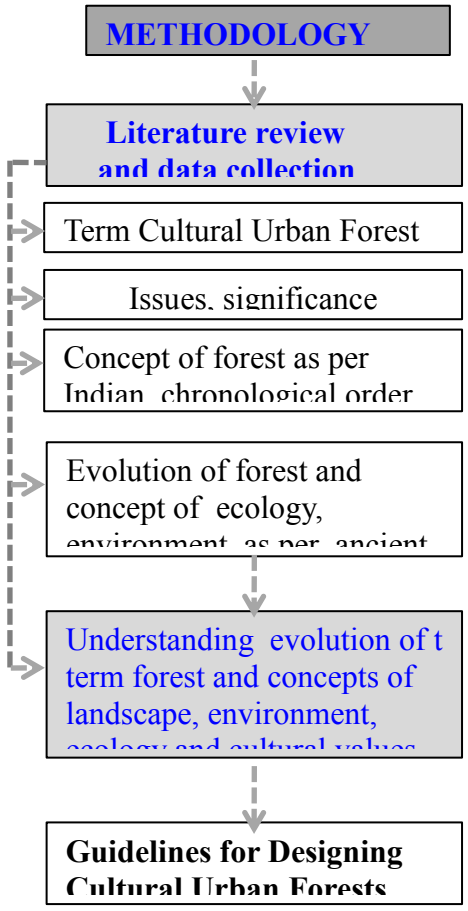
1.2. Objectives

- 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 outskirt 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.	***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**	

	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. Also no village would be complete without its woodlands in and around the house. Every village must have a cluster of five great trees, *panchavati* symbolizing the five primary elements earth, water, fire, air and ether-the totality of everything.	Types of forest: ***i. Mahavan-*** great natural forest-Equivalent to protected areas of today.- It adjoins the village & provides a place where all species can coexist. ***ii. Banwari / Shrivan-*** 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). **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.
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,	Ecological awareness Biodiversity means all living forms broadly ascribed as chara (movable living world) and achara (immovable: plant

	and vegetarian food habit	kingdom). Pollution refers to spoilage of the five gross elements by unethical activity. 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: Jangala, or the region of open spaces where a steady dry wind blowed. Anupa, or the marshy tract bordered by seas, where cold wind and networks of rivers prevailed. Sadharana, or the intermediate regions which had some of the features common to the other two regions.	The common plants of the Jangala region were khadira (acacia catechu), asana (terminalia tomentosa) and badari (zizyphus jujuba). 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). 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		
	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
	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	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	i. A commissioner was appointed to look into the availability of teak in the Malabar forests.	
1806	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	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**	
	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	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	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	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.

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 possible, 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.

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Study Area

Khandala village is a tourist place in Shrirampur 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.

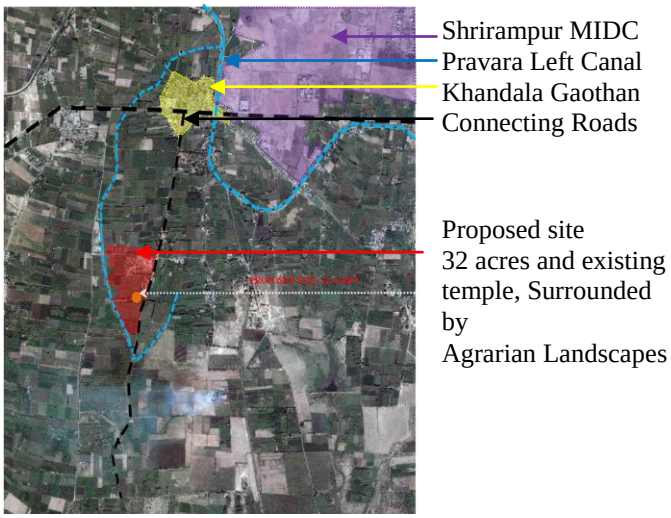

Fig No-1 showing proposed site , surrounded by agri fields, connecting Roads and major landmarks

Methodology

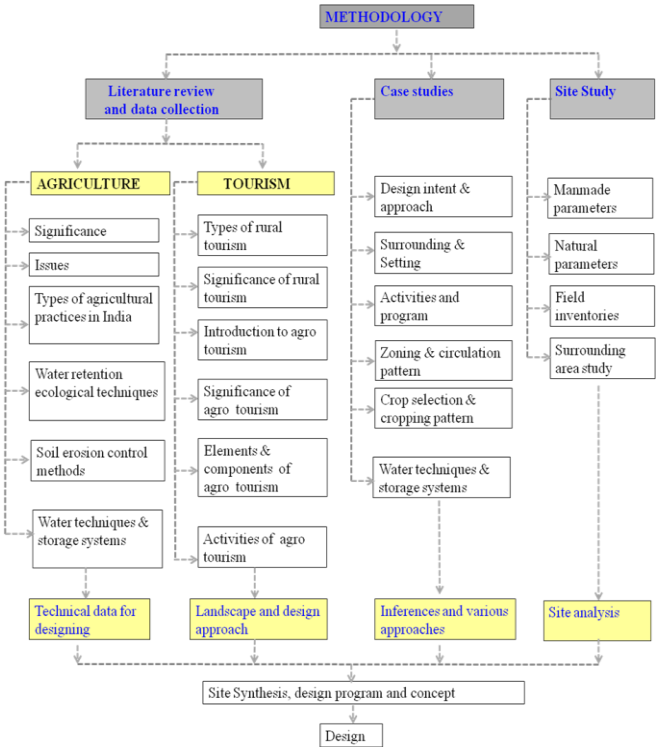

Chart No-1- Methodology

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 Ahemadnagar 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.

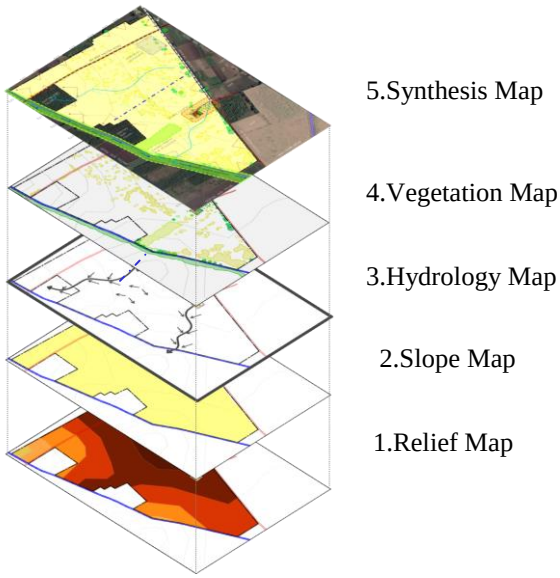

Fig No-2 Showing Layers Of Site Analysis

Findings and Conclusions

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

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No	Parame-ter	Result
A		**Literature Study**
1	**Agricul-tural pro-file**	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, sug-arcane require 2-3 years.
2	**Tourist profile**	District is having presence of tourist at-tractions like Religious, Wild Life, Na-ture, 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 im-portant 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 segregat-ed from tourist zone. Limited areas of the agricultural zone were accessible to tour-ists. Maximum area under orchard planta-tion
C		**Site Study**
1	**Manmade parame-ters**	Experience of agricultural lands and or-chards 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 worshiping. Temple area has been used for religious, recreation activities and social gatherings.
2	**Natural parame-ters**	District is having black catton soil , me-dium deep black soil. Elevation height of taluka is between 300m-600m, from mean sea level. Shrirampur taluka re-ceives rainfall between 500mm-800mm . District falls under scarcity zone. Ac-cording to agro climatic zones of dis-trict 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.

Final Design Output

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

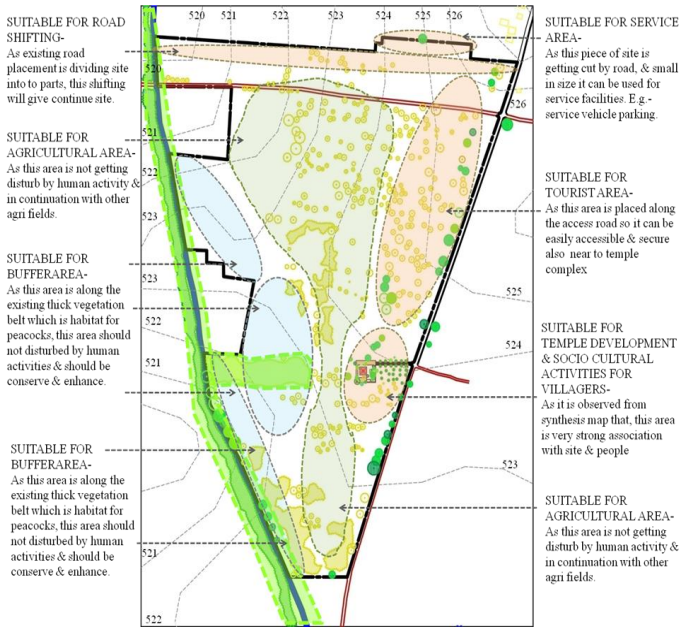

Fig No- 3- Suitability Map Derived from Synthesis Map Showing area suitability for activities.

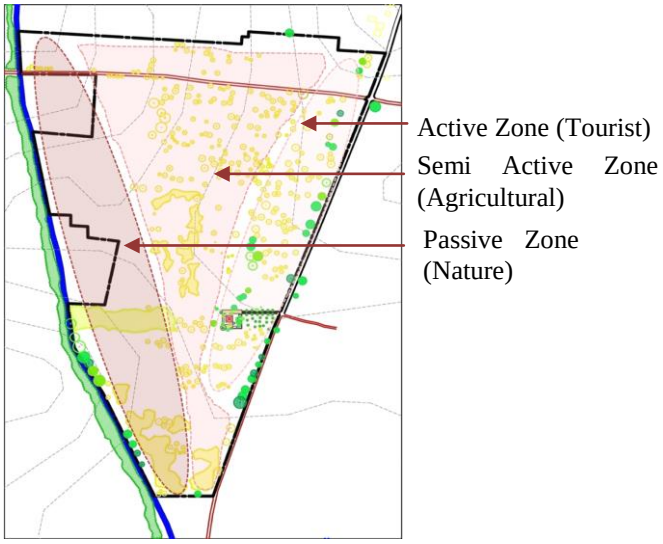

Fig No- 4- Zoning Map Derived from Suitability Map

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 bloom-ing season wise and planted along that months festival cele-bration area or activity zone.

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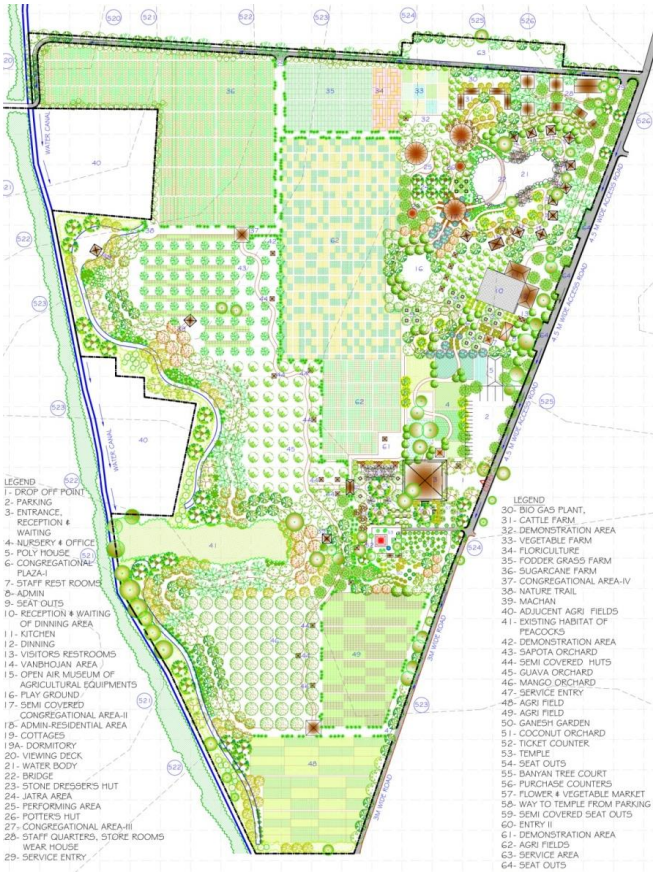

Fig No-5-Final landscape layout for Agro Tourism Dstination.

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.

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.

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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 gaothan 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 Gaothan
- 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 Gaothan.
- The strategies are given catering the entire gaothan 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

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Literature Review	Case Studies	Observations
• Referring to published articles and books exploring the concept of **'The Urban Village'** • Studying policy framework for **Green Infrastructure in India**	• Three cases of different contexts a) 2 of Model Villages - **Ralegan Siddhi** - **Hiware Bazaar** b) 1 of Project **''Garbage to Gardens'** by *Manda Karlsson* and *Annie Soder* • Inferences	• 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

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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:

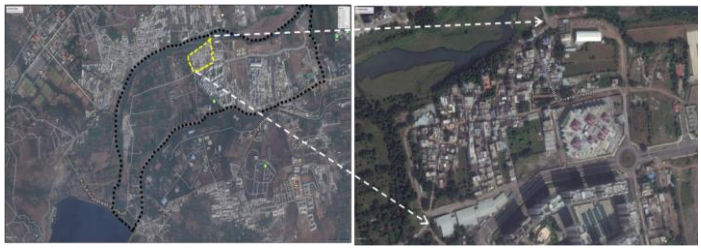

Figure 2 - Nanded Gaothan Boundary: 25 acres

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 gaothan. One such urban village is Nanded Gaothan, 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

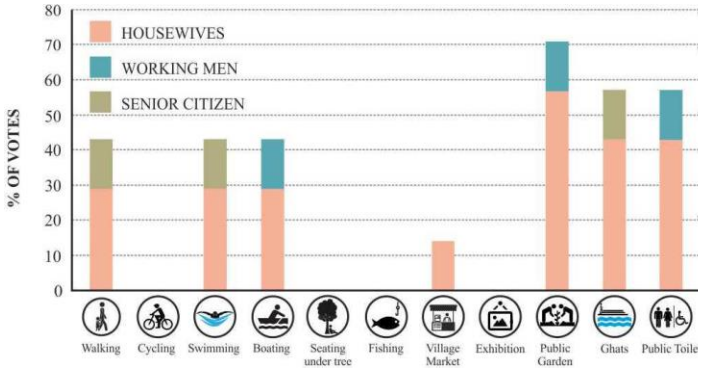

Figure 3 – Bar Chart showing people's preference

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

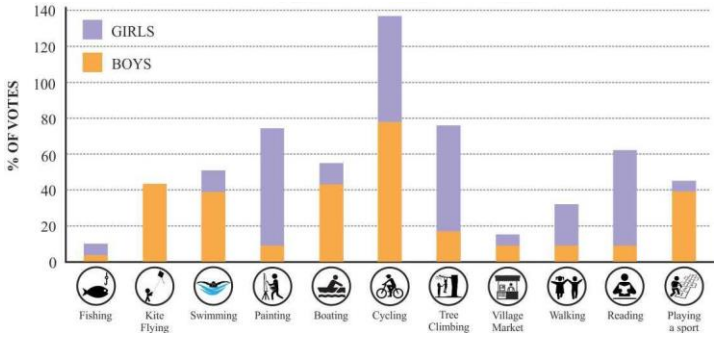

Figure 4 – Bar Chart showing students' preference

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 Depart - ment
Existing Use		Seating spaces, Crematorial activities and Visarjan activities	Drying of clothes & cow dung cakes
Approximate Area		0.53 km stretch	-----
Concern	**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	

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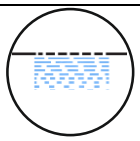
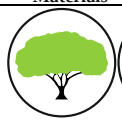
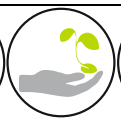
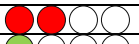
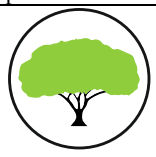
	Techniques	 Waste Water Treatment  Rain Water Harvesting  Weed Management, Removal of pollution tolerant species  Stormwater Management
	Built	Prohibition of built spaces in between the 25 year flood line, Low rise built spaces, Maximum 6m height, in the upland area of the river
	Material	 Eco-friendly 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**

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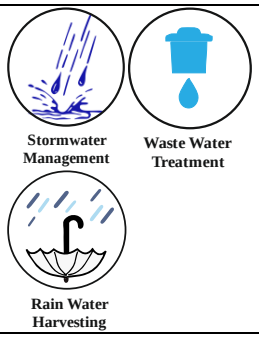
		coronarium, were cultivated in the past by the settlement. Large canopy evergreen trees should be used in community spaces	 **Flowering Fragrant Species**
4) TYPOLOGY		**FARMLANDS**	
Available Open Spaces		**Farmlands**	
Ownership		Private	
Existing Use		Residential	
Approximate Area		33600 sqm = 8.3 acres	
Concern	**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	
Concern	**Functional**		
	Social		
	Visual		
	Environmental		
Policy	**Activities**	-----	
	Techniques		
	Built	-----	
	Material		
	Planting	The plantation for Bio swale : *Cynodon dactylon (retz) Trin, Saccharumarundinaceum Retz, Saccharum spontaneum Linn, Vetiveria zizanoides Stepf, Ludwigia parviflora Roxb,*	
			Oldenlendia corymbosa Linn, Rungia repens Nees, Karanj, Taman

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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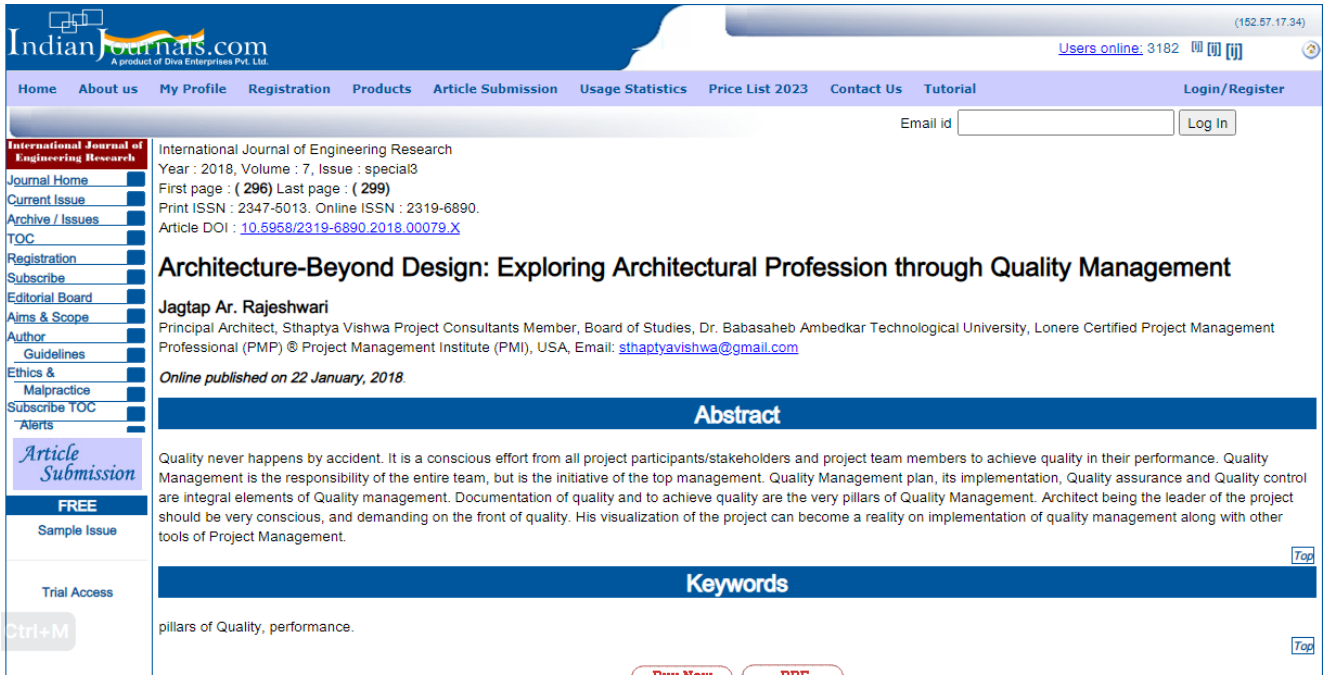
a. Design and Implementation Resources



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