

3.3 Research Publications and Awards


3.3.1 Number of research papers published per teacher in the Journals notified on UGC website during the last five years




Principal
Bombay Suburban Art & Craft Education Society's
L.S. Raheja School of Architecture,
Raheja Education Complex,
Kher Nagar, Bandra (E), Mumbai - 400 051.

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Title of paper	Name of the author/s	Department of the teacher/Students	Name of journal	Edition	ISSN number	Link to website of the Journal
				Year of Publication		
Reading Mumbai	Shilpa Gaurish Chandawarkar	M.Arch- Landscape	LA Journal LA56	2018-2019	ISSN 0975-0177	http://www.lajournal.in/56.asp
Experiencing Publicness	Saylee Soundalgekar	M.Arch- Landscape		2018-2019	ISSN 0975-0177	http://www.lajournal.in/56.asp
Public Realm	Trupti Talmale	M.Arch- Landscape		2018-2019	ISSN 0975-0177	http://www.lajournal.in/56.asp
From Landscapes to Landscape Practices Woven Invisibly in the City Fabric	Urmila Rajadhyaksha	M.Arch- Landscape		2018-2019	ISSN 0975-0177	http://www.lajournal.in/56.asp
Understanding Landscape Education in Architecture because Architecture needs landscape and not the other way round	Shilpa Gaurish Chandawarkar	M.Arch- Landscape	LA Journal LA67	2020-2021	ISSN 0975-0177	http://www.lajournal.in/67.asp
Traversing Landscape Architecture Education in Mumbai	Urmila Rajadhyaksha	M.Arch- Landscape		2020-2021	ISSN 0975-0177	http://www.lajournal.in/67.asp
An Urban Emerald - Navi Mumbai GREEN NEW DEAL SUPERSTUDIO (Part of University of Pennsylvania)	Author: Gauri Satam Co-Author:Urmila Rajadhyaksha Neha Shah	M.Arch- Landscape	JSTOR	2020-2021	SSID-30959341	https://www.jstor.org/stable/community.30959341
Forest Restoration of the Matheran Eco-Sensitive Zone GREEN NEW DEAL SUPERSTUDIO (Part of University of Pennsylvania)	Author: Rashmi Pookottil Co-Author:Urmila Rajadhyaksha Neha Shah	M.Arch- Landscape		2020-2021	SSID-30959342	https://www.jstor.org/stable/community.30959342
Reimagining Regional Landscapes - Navi Mumbai GREEN NEW DEAL SUPERSTUDIO (Part of University of Pennsylvania)	Author: Swapna Hankare Co-Author:Urmila Rajadhyaksha Neha Shah	M.Arch- Landscape		2020-2021	SSID-30959343	https://www.jstor.org/stable/community.30959343
Impact of a Mega Infrastructure Project: Case of Navi Mumbai International Airport GREEN NEW DEAL SUPERSTUDIO (Part of University of Pennsylvania)	Author: Nilesh Deshpande Co-Author:Urmila Rajadhyaksha Neha Shah	M.Arch- Landscape		2020-2021	SSID-30959344	https://www.jstor.org/stable/community.30959344
Proposal for Mitigation of Water Pollution Through Community Waters- A Way Ahead for Navi Mumbai Region GREEN NEW DEAL SUPERSTUDIO (Part of University of Pennsylvania)	Author: Jui V. Choughule Co-Author:Urmila Rajadhyaksha Neha Shah	M.Arch- Landscape		2020-2021	SSID-30959345	https://www.jstor.org/stable/community.30959345
Policies for Mitigating Environmental Degradation and Rehabilitation of Open Cast Basalt Quarries GREEN NEW DEAL SUPERSTUDIO (Part of University of Pennsylvania)	Author: Abhishek Chakraborty Co-Author:Urmila Rajadhyaksha Neha Shah	M.Arch- Landscape		2020-2021	SSID-30959346	https://www.jstor.org/stable/community.30959346
Reimagining Regional Landscapes - Navi Mumbai: "Proposal for Fishing Community "Micro-World within a World" GREEN NEW DEAL SUPERSTUDIO (Part of University of Pennsylvania)	Author: Tasneem Badri Co-Author:Urmila Rajadhyaksha Neha Shah	M.Arch- Landscape		2020-2021	SSID-30959347	https://www.jstor.org/stable/community.30959347
Learning from the Legacy - Case of Kalyan GREEN NEW DEAL SUPERSTUDIO (Part of University of Pennsylvania)	Author: Rohan Patil Co-Author:Urmila Rajadhyaksha Neha Shah	M.Arch- Landscape		2020-2021	SSID-30959348	https://www.jstor.org/stable/community.30959348
Learning from the Legacy - Case of Kalyan GREEN NEW DEAL SUPERSTUDIO (Part of University of Pennsylvania)	Author: Napoleon Ferdinando Co-Author:Urmila Rajadhyaksha Neha Shah	M.Arch- Landscape		2020-2021	SSID-30959349	https://www.jstor.org/stable/community.30959349
Learning from the Legacy - Case of Kalyan GREEN NEW DEAL SUPERSTUDIO (Part of University of Pennsylvania)	Author: Anuj Gudekar Co-Author:Urmila Rajadhyaksha Neha Shah	M.Arch- Landscape		2020-2021	SSID-30959350	https://www.jstor.org/stable/community.30959350
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Learning from the Legacy - Case of Kalyan GREEN NEW DEAL SUPERSTUDIO (Part of University of Pennsylvania)	Author: Heena Gohil Co-Author:Urmila Rajadhyaksha Neha Shah	M.Arch- Landscape		2020-2021	SSID-30959353	https://www.jstor.org/stable/community.30959353
Protean Living Adapting to the Climate Crisis	Ar. Anushka Samant, Ar. Mridula Pillai	B.Arch	Journal of IIA Volume 86/ Issue 06	2021-2022	ISSN-0019-4913	https://indianinstituteofarchitects.com/jia-e-magazine/


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An Urban Emerald - Navi Mumbai

Gauri Satam, Urmila Rajadhyaksha & Neha Shah

Forest Restoration of the Matheran Eco-Sensitive Zone

Rashmi Pookottil, Urmila Rajadhyaksha & Neha Shah

Reimagining Regional Landscapes - Navi Mumbai

Swapna Hankare, Urmila Rajadhyaksha & Neha Shah

**Impact of a Mega Infrastructure Project:
Case of Navi Mumbai International Airport**

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**Proposal for mitigation of water pollution through
community waters- A way ahead for Navi Mumbai region**

Jui V.Choughule, Urmila Rajadhyaksha & Neha Shah

**Policies for Mitigating Environmental Degradation and
Rehabilitation of Open Cast Basalt Quarries**

Abhishek Chakraborty, Urmila Rajadhyaksha & Neha Shah

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"Proposal for Fishing Community 'Micro-World within a World"**

Tasneem Badri, Urmila Rajadhyaksha & Neha Shah

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Rohan Patil, Urmila Rajadhyaksha & Neha Shah

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Napoleon Ferdinando, Urmila Rajadhyaksha & Neha Shah

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Anuj Gudekar, Urmila Rajadhyaksha & Neha Shah

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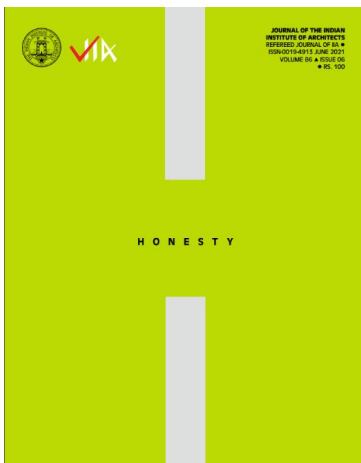
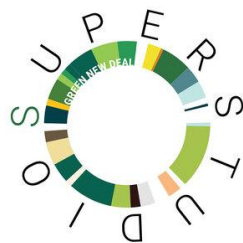
Learning from the Legacy - Case of Kalyan

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Protean Living Adapting to the Climate Crisis

Ar. Anushka Samant & Ar. Mridula Pillai

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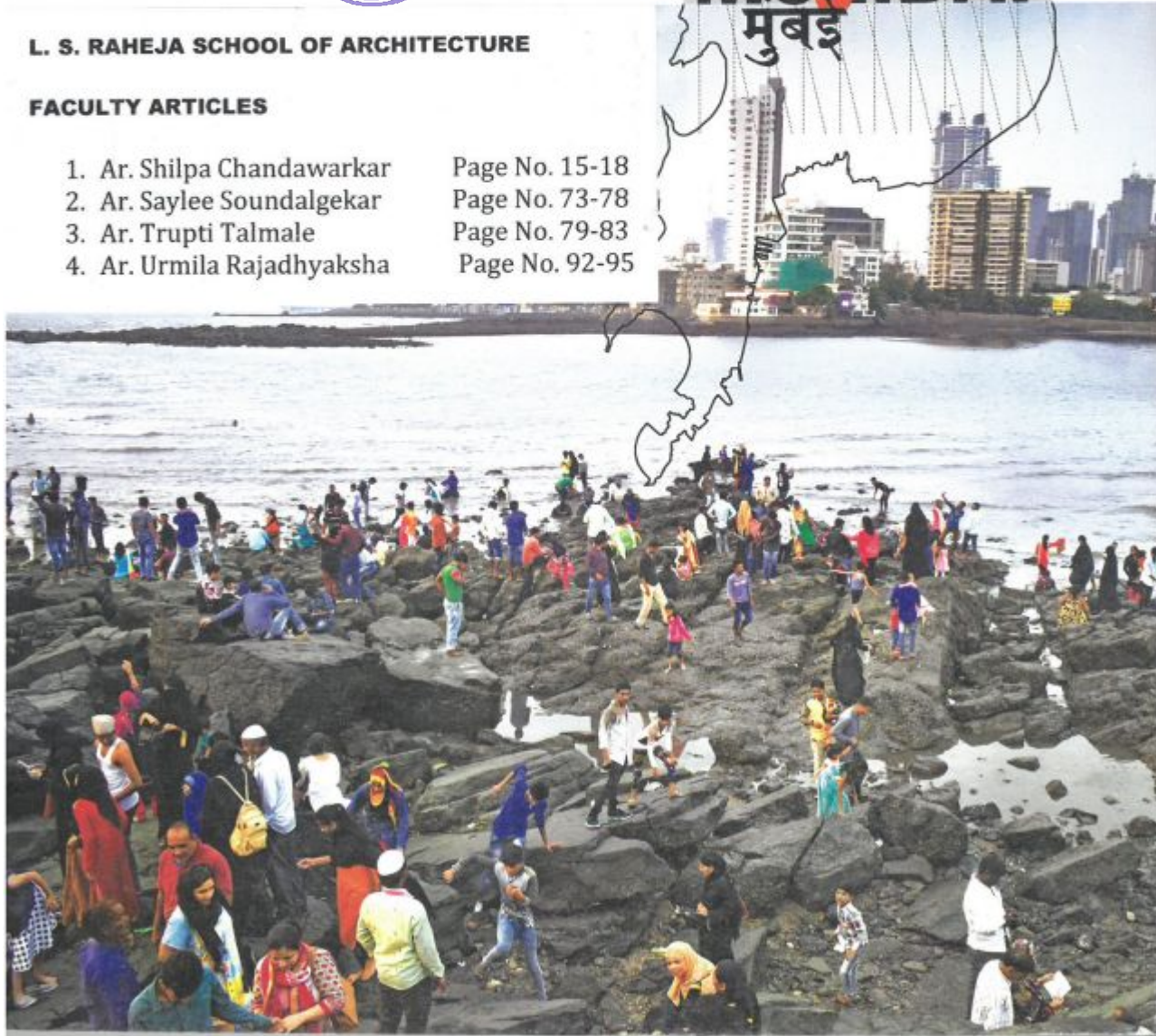
MUMBAI

मुंबई

L. S. RAHEJA SCHOOL OF ARCHITECTURE

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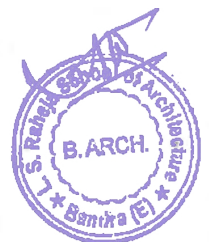


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Shilpa Gaurish Chandawarkar

READING MUMBAI

ये तेरा घर, ये मेरा घर,
किसी को देखना हो अगर
तो पहले आके मांग ले,
मेरी नजर, तेरी नजर

—'साथ साथ', १९८२ | गीतकार जावेद अख्तर

*To truly experience my abode,
you would need to see it through my eyes.*

—'Saath Saath', 1982 | Lyricist: Javed Akhtar

As an introduction to an issue which focuses on the ecological and socio-cultural nuances of Mumbai's landscape, the intent of this piece is to derive frameworks that introduce the readers to the multiple aspects that constitute and define these attributes.

An intricate patchwork, Mumbai's geography is the result of the fabric of seven separate islands woven tightly together with threads of rivers, lakes, hills, creeks and estuaries interlaced with mangroves, paddy fields and trees, further embellished with built forms signifying different slices of the city's native communities and imprints of its colonizers. An elaborate network of roads, running parallel to the steady rail infrastructure, adds a layer of patterns to this fabric.



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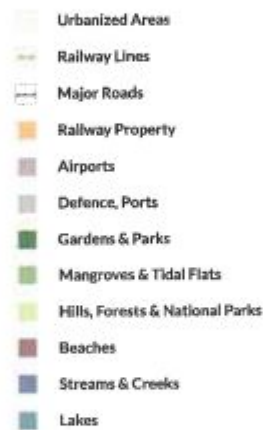
mumbai |

Surrounded by the seas and defined by the landforms, Mumbai, the 'maximum city'—a melting pot of cultures, attitudes, histories, and geographies—is a constant, complex conversation between the space and its people, built heritage, roads and vehicles, books and art and films and so on. This is the city of dreams for a country that houses a population of over a billion people, with its tangible chaos and intangible spirit.

A comprehensive reading of its landscape therefore necessitates an exploration of the aspects that are major contributors to the shaping of its environment. No study of the city would be complete without its people. As much as the people have shaped the city (literally through a series of reclamations, and figuratively through its undying 'Mumbai-never-sleeps' attitude), so it has shaped its people. Some of them have grown with the city, changed their lifestyles and occupations as the city changed, some held on to their social and cultural roots, and some, though very few in number, seem to have stood still through the passage of time (a reference in point would be the Parsi Baugs of Mumbai). The people of Mumbai would perhaps constitute the most interesting case study in the subject of human geography.

Henceforward, then, life in Mumbai can be better studied through its public realm, in the interactions in the space beneath a flyover, or on the corner of a footpath in a busy marketplace, or on a traffic island in high-density suburban Mumbai. The story of the shaping of the landscape of Mumbai will probably be best furthered by conversing with the architect and urban planner who chose to practice in the city and learnt enough of its problems to go back to the roots and set up a school of learning (the city is our laboratory, he believes), or the environmentalist who has worked globally in numerous cities dealing with their issues and is hoping to apply his experiences to his home city. The city's landscape has also found visibility on the global map through the works of a conservation architect who loves the buildings of the old city and has dedicated more than a decade of her professional life in making the cultural landscape precinct of Mumbai visible to the world, or the activist/architect who uses the potential of Mumbai's people to engage its public spaces, or perhaps the artists who used Mumbai to inspire them.

Speaking of the city and art, Bollywood is also quintessentially Mumbai—numerous films have been made in an attempt to mirror the city's soul and these will best describe the relationship between Mumbai, the land, and Mumbai, the people. The city has enacted different roles in these films—be it the setting, the villain or even the protagonist. Similar is the case with books that have been written about the city, in the city or for the city by writers who used Mumbai and even its trees, as a setting or as characters for their stories. The less-credited essence of the city, perhaps, lies within its natural features



→
MAP | NATURE IN THE CITY
The map has been developed on the basis of the city map by Survey of India Map, 2005 and P.K. Das & Associates, 2011
Map drawn by: Uttam Singh Negi & M Shah Alam

FACING PAGE PHOTOGRAPHS
TOP TO BOTTOM

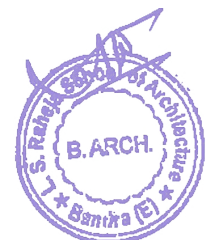
Near Hanuman Tekdi, Ghatkopar Hill.

Rocky shore at Haji Ali Dargah looking towards the city skyline.

Gateway of India and the waterfront at Apollo-Bunder area.

An old banyan tree, Juhu.

Photos credit: bsd+grafiniti



mumbai |

such as the rivers, the estuaries, the caves, and the hills that have celebrated the city and its environment before they were literally 'swept under the carpet' of so-called development.

Several attempts at writing about this city led me to the conclusion that a generic perspective would hardly do it justice. One starts questioning the very term 'city's landscape' and what really constitutes it. Every exploration of this city is a perception by itself, based at a point in space and time, making every narrative emerge from a kaleidoscopic range of experiences that enable an understanding of this city. It only felt right, therefore, to remain true to the multitudes of lenses of Mumbai, and put together and present in the form of this journal the myriad facets of my city to the readers. Hence, the two lines at the beginning of this piece—every contribution in this issue is Mumbai through one turn of the kaleidoscope, and would need to be seen as such.

And one more couplet to keep with you while you peruse this volume...

हर साँस में कहानी है,
हर साँस में अफसाना है,
ये शहर बड़ा पुराना है...

—'मया मेमसाब', १९९३ | गीतकार: गुलज़र

*This city has breathed a thousand lives
under the blanket of the changing skies.
With every page a new story to unfold
the ocean of memory this city does hold.*

—'Maya Memsaab', 1993 | Lyricist: Gulzar
English translation by Sinar Kundra

The number of patterns and compositions created through a kaleidoscope is effectively without limit... so are the ways of seeing the city of Mumbai, as are the people who have participated in its constantly evolving landscape. The essays, interviews and articles included here personify just a few patterns seen through the city's kaleidoscope. A few more issues would be needed at the very least to comprehensively represent the fascinating city called Mumbai.



↑↑↑↑

CLOCKWISE FROM TOP

Dense mangroves near Vikhroli (a suburb of Mumbai), Juhu Beach and Prithvi Theatre

Photos credit: bsd+grafiniti



Photos credit: bsd+grafiniti





mumbai |

Saylee Soundalgekar



Any city breathes through its trees, through the water that flows through its streams and rivers and through its open spaces. The open spaces form a 'network' for the functioning of the city — a network for the human interventions. A city adopts and adheres to the altering environments around this network making itself habitable. So, it is often said that the state of open spaces reflects the state and quality of life within the city. Amidst its daily chaos, the city of Mumbai lacks any open space planning as an organized network. In this context, a couple of projects in the recent past that stand apart where the neglected open spaces have been transformed into vibrant places by the collective and

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mumbai

“Networking public spaces is not just a physical activity, it is about social networking. When you start connecting spaces, you connect people because you engage people in the process of its development and networking and this has been an enriching experience for many of us as activists in Mumbai.”

— P. K. Das, Architect, Activist and Urban Planner



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mumbai |

CARTER ROAD | BANDRA, MUMBAI

CLIENT: PROJECT UNDERTAKEN BY BANDRA WEST RESIDENTS' ASSOCIATION
 PROMOTER: SHABANA AZMI, MP (RAJYA SABHA)
 WATER FRONT LENGTH: 1.25 KM
 CLIENT: BRIHAN MUMBAI MUNICIPAL CORPORATION



The 1.25 km long promenade that runs north-south along the water's edge was once considered a dumpyard of the suburb, the mangrove-lined edge supposed to have no aesthetic or ecological value and people found it unsafe to use the space for any recreational activity. It was in the early 90s that architect P. K. Das along with the local citizens decided to convert this neglected edge into one of the city's most popular promenades. Financial support came in the form of MP funds from Shabana Azmi and these efforts soon gave rise to a city-level public space replete with a linear pathway unifying the water, the regenerated mangroves and the rocky beach, punctuated with seating plazas, informal amphitheaters and play areas.



THIS & FACING PAGE

The rocky beach and mangroves form important backdrops of the Carter Road Promenade development





mumbai |

"A plan that redefines the 'notion' of open spaces to go beyond gardens and recreational grounds – to include the vast, diverse natural assets of the city, including rivers, creeks, lakes, ponds, mangroves, wetlands, beaches and the incredible seafronts."

— P. K. Das, Architect, Activist and Urban Planner



The temporality of the sea through the daily tidal variations and through seasons, ironically, is the sole constant backdrop against the drama of amalgamation of human interventions with the natural environment. As one moves from the southern end of the promenade towards the north, the developed public space shows a diversity of character in the types of public open spaces ranging from the environmentally fragile spaces to hard core circulation areas.

The dog park with children and adults celebrating the co-existence of fauna with adjacent mangroves, the kids' play area, followed by a palm hedge stop, capture and filter the evening sun rays adding immensely to the variety of performances. And just when the marshes seem inaccessible, the waves uncover a rocky path that walks inwards into the sea. The temporality of the space is best appreciated here. Exposed during the low tide, the water-leaves behind its presence in the rock crevices.

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mumbai |



The proposal protects the sea against wanton dumping and abusive activities that claims the green spaces of the city. The amphitheater, the open air gym, the tree grove, the inbuilt board game table tops and the large cricket bat share a common intermediate backdrop of the rocks and in the front lay the eat outs and clubs that speak of the vibe of an urban hangout place.

Yet again, towards the northern edge, as the promenade ends, the Khar Danda with the fresh Bombay duck dried on the nylon ropes and the primitive wooden boats anchored over the sea are a reminiscent of the days that saw the riches of the fishermen (*koli*). The linearity of the city overlapped with that of the open spaces leads to a design that is humane in scale and easy to identify with.

These kind of culturally active open spaces that blur the distinction between affordability and accessibility, I believe, are the markers of the 'publicness' and the community cohesiveness that the city needs to replenish.



All images courtesy the Author

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↑
The redesigned Carter Road Promenade is a vibrant urban hangout place today



Trupti Talmale

PUBLIC REALM

MUMBAI

Mumbai, the city whose population is expanding exponentially, is getting flooded with soaring high rise towers, connecting road networks, kilometers long flyovers, traffic guiding roundabouts / islands, pedestrian sky bridges and many such unaccountable construction elements. While the city is rapidly growing vertically as well as horizontally, its open space seem to be shrinking at a rapid pace as well. Open spaces in Mumbai are often either inaccessible, offer only partial access or have been encroached upon. Gardens, recreational grounds, clubs and gymkhanas, reserved greens within the gated communities presently account to most of the open spaces in Mumbai.

As per the report prepared by Observer Research Foundation, out of a total of 3780 acres of public open spaces in Mumbai, 422.5 acres are in the form of clubs and gymkhanas while another 242 acres are those which had been given to various trusts affiliated to politicians from 1995-1999. In all these account to 17.5% of the city's open spaces that can be accessed only by those who are members and are out of bounds for ordinary Mumbaikars. Other than gardens and grounds Mumbai has vast and diverse natural resources like coastline, river, creeks, mangroves, wetlands, etc. that are obvious potential open spaces to be included in the DP plan.



Locations of the projects
in the city of Mumbai

Does the fast pace life of this city where people need to travel long distances to reach even their daily work places allows them to take out quality time to be spend in these recreational spaces? Is there a need to identify spaces that can be treated as open greens which itself becomes the route of travel and adds quality to the travel time? Can the residual spaces below flyovers or sky bridges, stretches along pedestrian ways or traffic islands outside of inside the gated communities become an add on layer of networking greens to the hard core concrete layer of roads and buildings? Can the left over or unused spaces be sincerely put to their best potential usage in the benefit of the general public to improve the quality of their day to day life? Can we provide spaces which prove that recreation is not just a 'weekend affair' but it's an important part of our daily routine? Can we scoop out or mark out such unbarred convivial spaces within the hard core city where people can be sociable and festive?

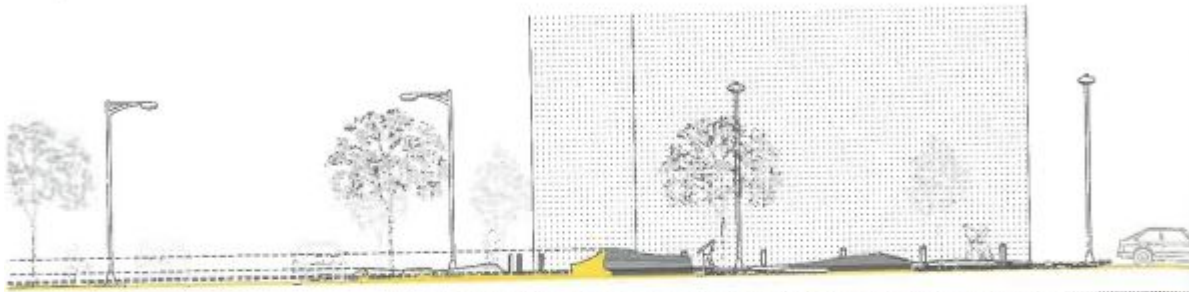
Here, we focus upon three small projects within the city that have started looking upon residual spaces as the potentials to creatively convert them into recreational spaces.



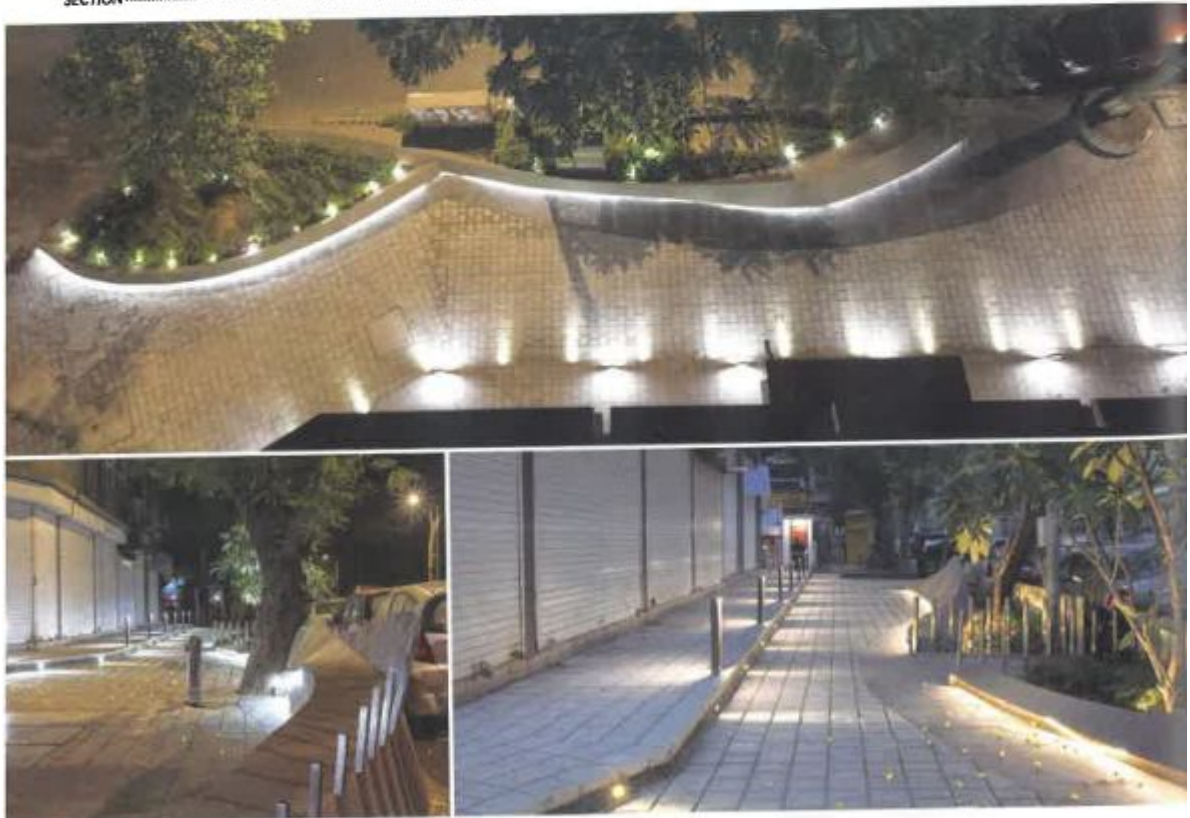
mumbai |

Pedestrian walkway at Gokhale Road, Prabhadevi | PROJECT ARCHITECT: STUDIO EMERGENCE

The site is located on a strategic location in terms of connectivity and local amenities. This route is taken by the majority of the population who wish to travel from the central side of the city to the business hub of lower Parel and

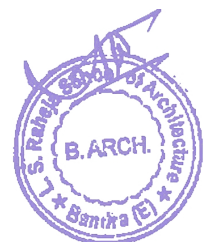


SECTION



↑↑↑ Night views of the designed Pedestrian walkway at Gokhale Road with edge treatment, seating, lighting and planting

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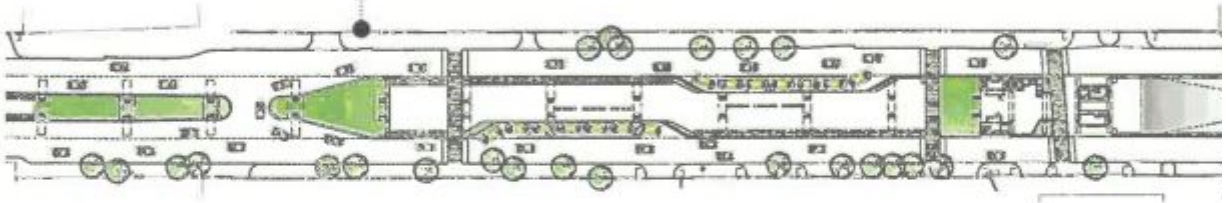
Worli, hence the visibility of the intervention is very high and vantage points for design could be obtained that helped in designing the space. Due to the largely surrounding residential zone and nearby schools in the vicinity, the footfall on the pavement is very high.

The intervention was designed keeping this in mind wherein the major area on the pavement was reserved for the people to walk on and the sides which were usually used for bike parking was utilized for plantation of trees and shrubs which also creates a respite for people from the polluting vehicles.

Public space under the fly over at Senapati Bapat Marg, Lower Parel

PROJECT ARCHITECT: STUDIO POMEGRANATE

The Fergusson flyover was built in 2001 to relieve congestion at the junction of Pandurang Budhkar Marg, and Senapati Bapat Marg. At the time, Phoenix Mills had a bowling alley, a few offices, and restaurants. The other mills in the area were



↑
Master Plan - Phase 1 for
the space under fly over at
Senapati Bapat Marg

lying defunct. Today, with every kind of establishment on this road, the area is marred with insufficient infrastructure, and is saturated. The most affected by this are pedestrians, who squeeze themselves into leftover pockets, stumble on uneven footpaths, if they even exist. First phase of this project looks at efficiently adding public space to kick-start the process of positive urban change.

Work on design of the stretch started in March 2016 with a thorough study of the area. A sample count of vehicles, interviews, visual inspections, and measurements were taken at every junction, level change, crossing, and physical divisions. On the basis of this study, interventions were decided to be given in three parts — the junction to a free U-turn, the U-turn to the end of clear walkable space, and an additional space inaccessible from the contiguous space under the flyover.

The junction to U-turn space is constantly in the throng of cars, this space will have a designated spot for the police, and the rest will be landscape. From the junction onwards is a space that enhances the walking space available for users walking to and from their offices in the north to the Lower Parel railway station. Addition of crossings enables one to walk in the shade at any time of the day. A shared taxi stand near the entrance of Empire mills, and another one outside Mathuradas mill compound has been moved, and has expanded, providing safe pick-up and drop off, space to wait, decongesting the earlier locations.



mumbai |



This is mostly a wide open space with an assembly of benches, planters, and safety buffers which will allow users to take a break, wait for friends, or simply be. The benches are polished concrete, held in place by block planters, which also keep in place weathering steel crash barriers on the outside. The plantation—*Sansevieria trifasciata*, *Rhapis excelsa*, *Cordyline*, *Lantana Camara*—are robust plants that are helpful in mitigating pollution, insect repellent, and require moderate watering. They are the visual division between the road, and pedestrian space. The final space is separated by a deep beam, and lends itself well to introducing a public toilet, and administration block. The toilets are utilitarian, well ventilated, and a separate block is built for the physically challenged.

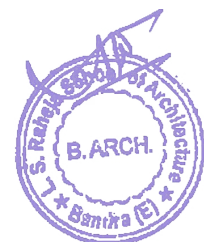
Entrance island of a residential society, Kurla West | PROJECT ARCHITECT: TRUPTI TALMALE

A small parcel of land (approximately 2,500 sq.ft), acting as an island surrounded by the main driveway, was left barren and unused except the four big existing copper pod trees standing dominantly. The idea was not only to



↑↑↑

The designed space under the flyover is a wide open place with an assembly of benches, planters, and safety buffers





For the entrance island of the residential society at Kuria West, the idea was not only to make it greener but to enhance it as a pivotal space associated with other small activities including flag hoisting ceremony etc., while keeping its functionality intact.

make it greener but to enhance it as a pivotal space associated with other small activities like kids enjoying the fountain, mothers and kids waiting for school bus, flag hoisting ceremony twice a year, etc., while keeping the functionality intact. While focus is always a good design, in this case the journey of making it was rather more interesting and challenging since it was a self-initiative. It involved several design presentations and a clay model to the working committee of this society and to convince them to a level where they agreed to release a minimal fund for its execution.



The other challenge was to get the design (which primarily involved sculpting of 1:1 slope earth mounds) executed on site without any landscape contractor but only with 2-3 *maalis* in two months' time that overlapped with onset of monsoons. Considering all these conditions and no time left for detailed drawings, very basic methods and simple tools like ropes, bamboos, lime powder, boulders, measuring tape, etc. were explored to their fullest in engineering of these mounds. The work just got over with dibbling of lawn on slopes and a basic planting by around second week of June when the heavy rains of Mumbai had already peeped in. The earth sculpture was then put to a test where it behaved as a 'floating garden'. During this time small drainage issues could be resolved by adding few little details like creating a catch pit that also acts as a pebble court.

The growth of Paspalum grass on slopes under the shade of fully grown trees in heavy rains was a tough task but the four months of care and nurture during this season helped it to get stronger and the garden flourished to its best during October heat.



Plan and Images courtesy the Author / respective offices



mumbai |

Mrimila Rajadhyaksha



FROM LANDSCAPES TO LANDSCAPE PRACTICES

WOVEN INVISIBLY IN THE CITY FABRIC

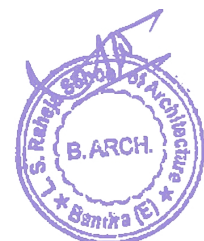
Though various portions of the present-day landmass known as 'Greater Mumbai' have seen settlements at different points of time since a few centuries before the Christian Era, the beginnings of the present 'megalopolis' of Mumbai can be traced back to seven islands, volcanic in origin, along the western coast of the Konkan region. Once the British realized the benefits of this calm harbour for trade, they consolidated their own position and along with it the city too. The global city that grew out of those islands eventually grew into its neighbouring islands as well as the mainland and is still growing. This global city spawned global citizens who travelled the world and brought back memories of memorable landscapes that they then built into the natural landscape that 'Bombay', as it came to be known, was richly endowed with.



Much of the nineteenth century in Bombay, as the largest of the seven islands was known, then witnessed the creation of landforms that impeded the tidal waters from revealing land all through the year and layers of reclamation pasted on these further firmed up the process. A variety of landscape spaces...landmarks for the city then and now were laid out both by the government of its time and the well-travelled and heeled citizens of Bombay. The Hanging Gardens laid out atop a water reservoir, the Esplanade, followed by the metamorphosis of the space the fort walls covered into the *maidans* of Mumbai, the sweeping Marine Drive are some of these. Unsurprisingly most of those who created these are relatively un-sung though the benefactors are sometimes known.

With the rise of the profession of landscape architecture worldwide, in the USA followed by Europe in the late nineteenth and early twentieth centuries, the profession and professionals slowly made their way into Bombay too.

A first such was S. D. Vaidya whose training in agriculture led him to establish the Department of Parks and Gardens in neighbouring Pune, and eventually he was supported to study at Versailles in 1958 by the Atomic Energy Establishment, whose landscape he came back to shape. Also worth mentioning is the brief sojourn of Prabhakar Bhagwat around 1954 to 1957, when in his own words—I did a lot of work for Burmah Shell—he also taught landscape architecture to students of architecture at Sir J.J. College of Architecture. Pune's Professor Shankar Brahme





mumbai |

continued the tradition of teaching at Sir J.J. College of Architecture. Among his fascinated students was one particular student Kishore Pradhan, whose landscape practice in Bombay—now Mumbai—spans nearly five decades but who actually became a landscape architect quite by chance as his leisure hobby of learning the French language in his spare time led to opportunities for scholarships in the field of architecture where landscape architecture was offered. Education in landscape architecture at Versailles meanwhile had grown by leaps and bounds and had become renowned in Europe. In the 1970s, when upon completing his studies he returned to Bombay to initially look for a job, he ended up setting up his own practice. To quote his own words once started, he 'never had to look for work... it kept coming'.

While working and teaching, Pradhan inspired and influenced many young professionals to pursue landscape architecture as a practice. Over years, the practice Kishore D. Pradhan Architecture+Landscape is recognized for creative design solutions and efficient project performance. A few years younger than Pradhan, Vijay Hattangadi—post studying landscape architecture and working with Ravindra Bhan in Delhi—returned to set up his practice in Mumbai which was tragically cut short by his untimely death. He, like Pradhan, had a wide range of works. Some of his works such as Vijay Mallya's bungalow at Alibag have been featured in newspapers.

Mumbai has also stood witness to talented landscape practices which evolved from an intrinsic affinity for this field, as some of these practitioners developed their practice despite their training in other spheres. For many such practitioners, the practice of landscape architecture meant leaving behind established jobs and beginning anew. A risk they took willingly. A prominent practice among them would be that of Padmaja and Rajoo Pradhan who, in spite of their professional training in architecture and urban planning, plunged into the landscape design practice due to their sheer passion in the field.

Landscape practices during this period thus largely evolved around the persona of the principal lead and studios / offices were generally not large. Most of these revolved around a sense of a 'calling' to pursue the profession which was extremely personal, quite similar to the early architectural practices. A point to note here perhaps is that in a city driven by business, this was probably a little unusual. Some architects hailing from Mumbai chose to establish their practice in other cities as the conditions for growth of a landscape practice were considered to be more favourable elsewhere.

The changes in the real estate industry in the 1990s changed some of these equations and architects were quick to perceive this, and many architectural firms developed strategies to meet these developments by expanding their role to service providers and thereby growing in size and structure formally and informally. Most landscape firms, however, continued to retain their size and modalities of structure. However, the sense of 'ethics' was very strong among landscape architects and this translated into a strong sense of camaraderie.

mumbai has also stood witness to talented landscape practices which evolved from an intrinsic affinity for this field, as some of these practitioners developed their practice despite their training in other spheres. for many such practitioners, the practice of landscape architecture meant leaving behind established jobs and beginning anew.



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↑ Hotel Hyatt Regency, Mumbai
Landscape Consultant: Kishore D Pradhan Architecture+Landscape



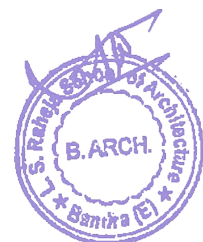
↑ Lodha Group I/Think, Mumbai
Landscape Consultant: Newarch Landscapes

As Kishore Pradhan notes, "In initial years of the profession in eighties and nineties, struggle of professionals like Suvarna Sathe, Swati Dike and Rajoo Pradhan needs to be recognized. They were professionals who increased an awareness about the practice in various scales of works in the city."

Bombay soon became Mumbai and the pace, always fast, grew frenetic. The new entrants into the field of landscape architecture recognized the need to evolve beyond the persona driven practices and to develop a team of the 'we' as against the 'I', which characterized established practices. This period also saw the entry of international master planning and landscape practices in the Indian realty sphere intensify, and recognizing this existential threat, many landscape architects in Mumbai explored ways of combating this. An off the beaten track experiment in this respect was that of Newarch Landscapes LLP which from its inception in 1999 charted a new course based on the concept of 'we'. All employees in Newarch are stakeholders—in varying ways as decided internally—in the work they do. Landscape practices in the city perceived the need to expand their capacities but knowledge of the value they could provide the city was restricted to the few converted. And most attempts at advocacy were restricted to preaching to the converted. This despite the multiplicity of typologies and scales that landscape architects worked across.

Pradhan notes, "At present, there are very few opportunities (apart from builder related projects) to work on landscape architecture in Mumbai, due to high land value, unplanned development and rampart encroachments in the city. This may explain why the profession of Landscape Architecture does not get its due recognition here. The course at L.S. Raheja College, headed by Urmila Rajadhyaksha, a dynamic personality, would be significant in bringing up the profession in Mumbai."

the new entrants into the field of landscape architecture recognized the need to evolve beyond the persona driven practices and to develop a team of the 'we' as against the 'i', which characterized established practices.



mumbai



↑ Kotak Mahindra Bank, Bandra Kurla Complex, Mumbai
Architect Consultant: Concept Architectural Services Pvt. Ltd.
Landscape Consultant: Enviroscape India



↑ Headquarters of Municipal Corporation of Greater Mumbai, Mumbai
Landscape Consultant: Urmila Rajadhyaksha

reflecting a sense of urgency, the recently established practices in mumbai are emphatic about environmental and ecological considerations being central to landscape... need perhaps, to weave a new idiom and develop ways and means to position themselves so that they can be seen as meaningful to their unique city.

With the dawn of the new millennium and increasing schools offering Master's programs in landscape architecture across the rest of the country, the number of landscape architects in Mumbai too have increased. Some multinational landscape and omnibus architectural firms from across the globe set up their offices in Mumbai. Some practices—nationally headquartered but outside Mumbai—also set up offices in the city, including those of Design Cell (Delhi-NCR) and M/s Prabhakar B Bhagwat (Ahmedabad).

With the relentless growth of urbanscape, the city continues to fester and swelter. Reflecting a sense of urgency, the recently established practices in Mumbai are emphatic about environmental and ecological considerations being central to landscape. However, despite this network of professionals, and the existence of landforms that define beautiful landscape spaces in the city, recognition of the role of landscape architects remains largely unperceived by the city at large. Perhaps this 'invisibility' can be attributed to the singular lack of ambition exhibited by landscape architects, especially when this is contrasted with the kind of clout enjoyed by an architect with equal or less years of practice... and this after nearly five decades of existence. Mumbai's landscape architects need perhaps, to weave a new idiom and develop ways and means to position themselves so that they can be seen as meaningful to their unique city.



With Inputs from Kishore Pradhan, Tarini Hattangadi, Shashank Valdiya, "Bade Sir: An Era Ends" P. B. Bhagwat talks to Aniket Bhagwat, Swati Dike, Suvarna Sathe, Rajoo Pradhan, Sriganesh Rajendran, Bhakti Thakoor, Arjun Sharma and the faculty at the Master of Architecture in Landscape at the L.S. Raheja School of Architecture

Photographs courtesy the individual offices.



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UNDERSTANDING LANDSCAPE EDUCATION IN ARCHITECTURE

BECAUSE ARCHITECTURE NEEDS THE LANDSCAPE...
AND NOT THE OTHER WAY ROUND

Shilpa Bakshi Chandawarkar, who has been associated with the teaching of the subject at undergraduate level, discusses various concerns of perception of the subject amongst students, curriculum that addresses it as an "allied subject", and at the same time also notices growing interest of the students to integrate environmental values in their work.

India is perhaps one of the few nations where Landscape Architecture education is available only as a post-graduate degree program, open in the main, only to architecture graduates. In the majority of the architecture schools across the country, Landscape Architecture is taught as an allied subject for a semester or two midway through the course, sometimes, purely as an elective subject, which a student may or may not study. Since the knowledge imparted in the B.Arch program is the only exposure that architecture students have of the subject, it becomes imperative that the course content, duration and teaching methodology are developed to ensure that architects are sensitised towards the role and impact of landscape design and landscape architecture in their profession. It is equally important for the profession of landscape architecture in the country that the new entrants are made aware of the scope, responsibilities, and challenges of this field.

This essay, reflecting on Landscape Architecture Education in Undergraduate Architecture studies, is an ongoing dialogue with myself. The small narratives are personal experiences recorded over the past three decades, as a student and then as faculty for the undergraduate program in Architecture. The course structure, syllabus and curriculum mentioned herein pertains to the one practised by the University of Mumbai. The structure of the write-up echoes my often-confused, ever-changing and evolving thoughts on the role of landscape architecture in architectural education.



foundation level |

My introduction to the subject of landscape architecture as a student

30 years ago, my seniors in Architecture school introduced me to the subject of Landscape Architecture in the fourth year of the 5-year B.Arch program thus: *"It is easy, basically nothing more than making a site plan with a few rubber stamps of tree blocks and lots of green, blue and brown colour pencils. Only issue is you have to learn botanical names of trees!"*

As the weeks went by, there were conversations amongst us as students: *"The landscape portfolio is a cakewalk if you have worked on the Louis Kahn trophy for NASA. It would be good to get this portfolio done by the juniors – it is a good way to know if they can help with rendering our thesis sheets next year."*

A few days into the semester, the teachers gave us an introduction to the subject: *"Landscape Architecture is the art and science of designing open spaces. The syllabus includes planting, hardscape elements, designing children's play areas, highway landscaping and historic styles of landscape design. There is a written exam and design exam at the end of the year. For studio work, develop the outdoor spaces of your semester 6 design portfolio. The submission will include a site plan, two site sections and one detailed area layout."*

The following year, I remember telling some of my juniors: *"I loved the subject... it is a hundred times better than designing buildings!"*

Whether it was due to the course content, the way it was taught, the fact that it was included in the penultimate year of the study course, or the way students perceived it, *Landscape Architecture was largely known to be a subject where one had to know the names of a few trees and learn some good rendering techniques to make a good-looking site plan.* However, despite this perception, there was something about this subject that struck a chord, deep inside me [as with many other architects who have been drawn to this subject] as I opted to pursue my post-graduate studies and make the subject my chosen profession in the years to come.

My engagement with landscape architecture as a teacher

I started my foray into the field of academics armed with a master's degree in landscape architecture and an unshakeable belief that landscape is all-encompassing and includes a holistic understanding of ecology, natural sciences, society, culture, tradition, and technology. I believed that as architects, we needed to be made acutely aware of the natural systems that we are intervening in, when we build. Wanting to share whatever little I had learnt, I prepared lectures on the landscape analysis of a site [geology, topography, hydrology, vegetation, regional landscape character and setting], understanding landscapes as compositions of land, water and vegetation, traditional and cultural connections in a landscape, and the principles of *'Design with Nature'*.

Whether it was due to the course content, the way it was taught, the fact that it was included in the penultimate year of the study course, or the way students perceived it, Landscape Architecture was largely known to be a subject where one had to know the names of a few trees and learn some good rendering techniques to make a good-looking site plan.



To my surprise and dismay, I found students approaching me to discuss their final site plans, which trees to use such that the built forms are not hidden, details of swimming pools and water bodies in arid regions and large flat swathes of green on contoured sites; I often heard the words *"everything is done, just landscape is pending"*! What bothered me was that the perception of the subject even 10 years later was not too different from what I had experienced as a student.

Why are we unable to convey to students that landscape and architecture are not different entities but a single integrated one? Why does landscape remain an added amenity to a project in the minds of architects?

Many a debate with colleagues in the faculty room led me to believe that if this bothered me so much, I would have to find ways to teach contextual understanding, reading contours, inserting plinths, and aligning circulation networks on contoured sites, modulating the landscape as a setting for architecture, open and built space relationships, surface hydrology and grading in landscape classes. It would have been a pleasure to teach all of this, but it felt like a bit too much and a bit too late to achieve this in a subject that is awarded only 108 lectures of 45 minutes each [as opposed to Architecture Design and Building Technology which have 288 lectures each] in the fourth year of a five-year program. One also wondered why, if all of this is the premise of landscape architecture alone, is it then taught for a few hours, and a couple of semesters in a 5-year long course?

Given the scope and role of the field, can landscape architecture really be taught in 2 semesters? Would it not function better as a full bachelor's degree program?

It may be worth mentioning here that my initial years of teaching also coincided with the number of architecture schools in my city growing from 3 to 15 [currently there are 27], resulting in a serious dearth of landscape architects to teach in these schools. A few of my fellow landscape architects and architects who shared a similar angst did come together to prepare a common framework to teach the subject across the various architecture schools in the region. The framework was exhaustive and attempted to address the intangible and tangible aspects of landscape across all scales and typologies. Many of us have been using this framework jointly and separately, modifying it over the years as we oscillate between being teachers and students of landscape architecture.

We were fortunate that a revision in the syllabus moved landscape architecture to the third year of the course, which helped students incorporate the learnings from this subject into their last 2 years of study, especially the design thesis. As per the last syllabus revision, it is now recognised as an Allied Design subject and individual colleges have the freedom to conduct it in any year of their choice. The subject is titled Allied Design and the syllabus no longer calls it

Many a debate with colleagues in the faculty room led me to believe that if this bothered me so much, I would have to find ways to teach contextual understanding, reading contours, inserting plinths, and aligning circulation networks on contoured sites, modulating the landscape as a setting for architecture, open and built space relationships, surface hydrology and grading in landscape classes.



foundation level |

Landscape Architecture nor does it specify the course content. Most of the colleges in Mumbai, however, have chosen to continue to teach a similar content as earlier since no other subject formally covers these important aspects of learning. While this new syllabus format offers more flexibility and freedom in content, it also does away with a compulsion to address Landscape Architecture as a part of architectural studies.

Will the scope and importance of site analysis, master planning, context studies and socio-cultural understandings decrease or increase if they are not studied under the domain of landscape architecture?

At a time when insensitive urban and rural development [regional and local] is impacting the health of our towns and cities as well as our natural reserves, when climate change is threatening the very existence of human settlements across the world, Landscape Architecture remains the one subject in undergraduate studies that orient the young minds of students of architecture towards a deeper understanding of the natural systems and develop in them a sensitive approach while intervening in them. To my mind therefore, there is no right or wrong time for incorporating this subject in architectural education – it should form a part of the mandatory knowledge that an architecture student needs to graduate with.

As I continue to grapple with these unresolved questions, I would like to end this introspective essay on a positive note. Over the past few years, I have seen the interest in both, the teaching and learning of landscape architecture grow. Young landscape architects with a flair for teaching and exploration of newer methods have managed to design very engaging and immersive landscape studio exercises. The selection of design thesis topics by the final year architecture students displays a very keen interest in ecology, natural landscapes, conservation of built and unbuilt heritage and public landscapes. The *Mohammad Shaheer Landscape Trophy* conducted by ISOLA for NASA has become one of the most popular competitions for undergraduate students of architecture and year on year, one sees an improvement in the understanding of and sensitivity towards the subject. Even more encouraging, the number of students opting for further studies in landscape architecture has taken a leap too.

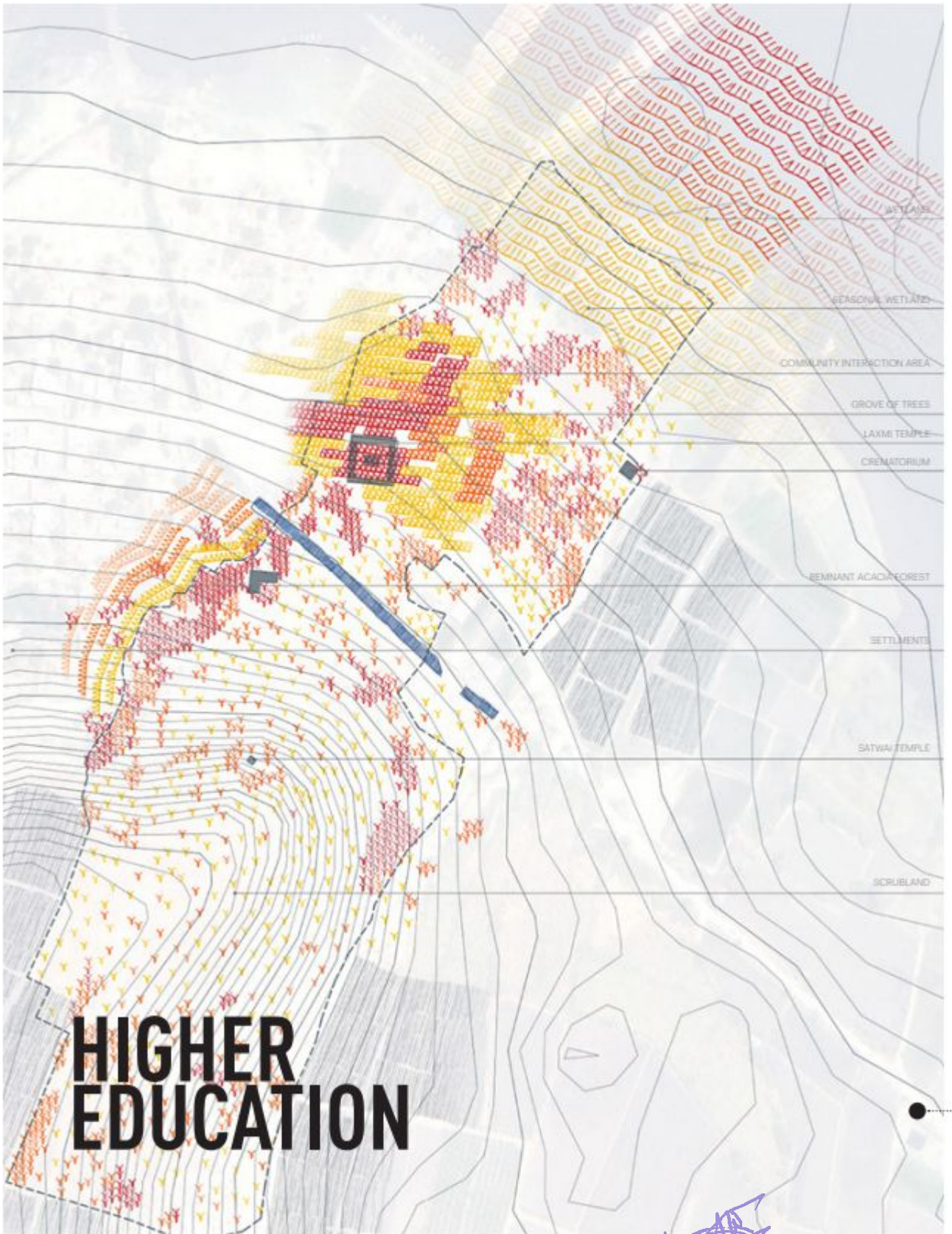
As the awareness and relevance of the profession grows in strength in India as across the world, one can hope that the efforts taken by landscape educators over so many years will someday bear rewards in the form of more sensitive architectural interventions, appropriate infrastructure development, protected natural environments, healthier cities and a better planet to inhabit.

Acknowledgments

This writeup gives me the opportunity to express my gratitude to my colleagues in Mumbai who have been an integral part of this journey with me. I have learnt and continue to learn from all of them, from their teaching frameworks, lectures, studios and crits.

Thank you Arjun Sharma, Bhakti Thakoor, Hrishikesh Phadke, Khushboo Adhiya, Nandini Rawani, Padmaja Pradhan, Prachi Nadkarni, Sriganesh Rajendran, Vinita Sapre, and Urmila Rajadhyaksha





HIGHER EDUCATION



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TRAVERSING LANDSCAPE ARCHITECTURE EDUCATION IN MUMBAI

Urmila Rajadhyaksha profiles the journey of the city's first landscape architecture program and its achievements in the field of academics, the accolades it received, and its engagement with the profession and the city at various levels.

Having completed my Master of Landscape Architecture from SPA Delhi in 1990, I began my tryst with Landscape Architecture Education as a core competency once more in 2016 [26 years later] by becoming the founding head of the three year part-time Master of Architecture in Landscape course which had been approved for implementation by the University of Mumbai in 2008. We at the L.S. Raheja School of Architecture, Mumbai were the first college to successfully apply for implementation of this program in 2015. Eventually we got the program going in 2016 after navigating the mandatory regulatory environment. It was and is, the only such program in the country.

This interesting journey of the past 5 years has been path-breaking in several ways, both expected and unexpected. With seven students ranging in age from their 20s to their 50s [all architects as mandated by the Program ordinances], with a minimum work experience of 2 years and almost an equal number of teachers, also ranging in age from their 20s to their 50s [all landscape architects], ranging from those fresh out of college to those with 20 to 25 years of experience, it was a close relationship from the word go.

PREVIOUS PAGE |

PEOPLE, PLACE, AND PALIMPSEST

Tracing Lines: Spring 2021 Studio

Palimpsest Plan: Site grains and
associations interpretation

DRAWING CREDIT: Sanika Kalantre

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higher education |

In any Master's Program, learning is never confined to what is taught and peer learning from interaction, as well as from seniors and juniors, plays a very important role. For the first batch, they had no seniors and for an entire year, no juniors. Teachers were thus both mentors and peers. To a large extent this continued with subsequent batches as well; due to limits of space and time all three batches were on campus only once a week on Saturdays.

Being the first University-approved Landscape Architecture Master's program in the city of Mumbai, we were fortunate to garner a tremendous amount of support from the professional community of Landscape Architects in Mumbai and elsewhere. Kishore Pradhan, the founder of the oldest landscape architecture practice in Mumbai, honoured us with his presence at the orientation for the first batch. We also had guests who called me up and told me they wanted to conduct free workshops for my students.

Sameera Rao's introductory workshop on the use of GIS was one such. Rohan Sinha from Edinburgh spoke on Landscape Character Assessment. stalwarts like Aniket Bhagwat and Shilpa Chandawarkar and many more came in at our request as end-semester jurors. Our students soon learnt to ensure that all our guests who came in as strangers, left as one among our own, carrying with them memories of the day spent. Did this help the students to develop networking skills? Perhaps.

Mid-project reviews were an additional feature where we invited guest reviewers to enrich the work in our studios. This was a way to connect the program with professionals who were at various stages of their careers. These reviews had the additional advantage of contributing to ongoing student work, when such discussions could develop the ability to review one's own and one's peer's work. Very early, we used this to tackle the student's possessiveness of their work

THESIS JURY

Thesis jury of the first batch
[2016-2019]



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and their resistance to accept change. It also prevented students from working primarily for their grades, by gauging what the faculty could be looking for, and helped them to develop independent thought processes.

While conducting a predominantly 'Taught' Master's program as opposed to a research-based one, it was our efforts 'Beyond Taught' that added value to the program. Our students are encouraged to avail of all opportunities available; adopting a flexible attitude towards our working schedules in order to enable this, has contributed greatly towards honing our student's abilities. Participating in the Landscape Foundation India's Student Competitions has won our students awards and much more. Translating theory to site was key in the competitions, and during the three years they ran after our program began, awards came our student's way every single year.

Attending events together was also something we emphasised right from day one and this began in right earnest with our very first batch [barely weeks into the program] attending the Lokmat Infrastructure Conclave. When our students questioned us as to how this could be 'Landscape', we set them on the path to answer their own questions. Cut across to the ISOLA Goa Conference in 2017 when our second semester students found a whole community they belonged to and worked in teams to maximise and share their knowledge gain.

With the advent of the next Academic Year 2017-2018, we grew in numbers and some of our students chose to participate in a joint site studio at Ayodhya conducted by Dr. Amita Sinha, which also saw participation by BNCA Pune and the Government College of Architecture, Lucknow. This was a great learning experience on the job as it ranged from site visits to nights working together in the bitter cold, ending with presentations to the authorities. Providing these opportunities as a choice was a conscious decision on our part. Our working students with their hectic schedules, needed plenty of support from the Department in order to avail of such opportunities. Being flexible enough to manage this, has been a cornerstone of our policy. Even if it meant much behind-the-scenes work, the student experience was always prioritised.

SIKKIM REGIONAL STUDIO
World Cafe Brainstorming
Session in studio



higher education |

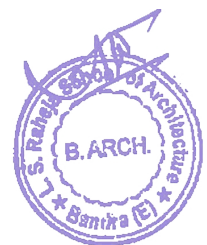
Managing hectic academic schedules within the limited days at our disposal is not easy but I'm sure many of our students who participated look back at these learnings with happiness. A point we have always stressed is that a Master's program, ours included, is more about the transformation of individual students. Earning accolades at various levels from local to global are no doubt important, but we work equally hard with each and every student of ours to help them make that transition. With the hectic lives they lead, managing homes, work-places and a demanding program, the extra support is sometimes more important than the efficient delivery of interesting content, though we do that too.

From participating to organizing, we moved on to establish the Landscape Legacy Project at our department when we were a few months short of turning three. Our first-year students had already demonstrated their organizational skills by organizing 'Abhiviyakti', an event held in collaboration with ISOLA Mumbai, involving invited presentations from MLA theses. They also collaborated with the second-year students for the one-day symposium 'Land Legend Place', an event where we created new formats for presentation and our students presented their work, sharing a platform with international experts.

Our publication based on this event is under process. Collaborations and outreach have been a hallmark of our functioning. In the third year of our existence we integrated faculty from the Botany and Geology Department of the renowned St. Xavier's College, Mumbai. We also encourage our students to reach out; in between their second and third years, our first batch voluntarily worked for fifteen days with government and non-profit organizations, as well as with interdisciplinary professional organizations. All these organizations did not normally work with landscape architects and the core idea was to evaluate the difference it would make to them to have a landscape architect on board. With our fourth batch, we introduced a 'Vertical Studio' where four teams across three batches studied the mangrove habitat and interacted virtually with a game designer. Our students, with members of Godrej Mangroves and people from the toy industry, developed four beautiful, enjoyable and informative board games.



VERTICAL STUDIO
Godrej Mangroves visit



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VERTICAL STUDIO
Board games review at
Aakar College festival



The events of 2020 with the onslaught of COVID-19 drove us, like everybody else across the globe, out of our classrooms and into the world of remote working. Used as we were to reinventing ourselves, we used the opportunity to participate in an International Super-studio woven around the Green New Deal. We were honoured to have as our reviewer Dianne Jones Allen, founder of Design Jones, Vice-President of Education and Director of the Landscape Architecture Foundation. Representing the University of Mumbai, we were also invited to participate in the Annual DAIDA Awards and were probably the youngest institution invited. Much to our excitement, our student Noopur Sejpal made it to the shortlist.

In our new remotely working world we have carried ahead our Landscape Legacy project by soft-launching our YouTube channel with nine stories of Jalkatha, which are stories of landscape-based infrastructures of water from the Indian subcontinent, and we plan on following up with much more. Directed by our authorities in 2020, our faculty team worked energetically and enthusiastically on a brand new two-year full-time Master of Architecture in Landscape course.. This was approved but in the confusion of the pandemic, missed the opportunity for new admissions. Ideally we would have loved to offer options of both full-time and part-time courses, but the University of Mumbai is not ready for this flexibility yet.

A large majority of our students are teachers in architecture schools across Mumbai and we really see this as an additional responsibility, as they groom young architects. In the confused scenario of education all across the country, we do hope that the presence of landscape architecture education would grow in our city of Mumbai and seed a larger community... the Community of Landscape.



All photographs courtesy of the Author



Part of University of Pennsylvania
GREEN NEW DEAL SUPERSTUDIO



Part of University of Pennsylvania

**Green New Deal
 Superstudio**

SEARCH 671 ITEMS IN THIS COLLECTION

Search Green New Deal Superstudio



This collection of design ideas was generated through an open call to translate the core goals of the Green New Deal—decarbonization, justice, and jobs—into design and planning projects with regional and local specificity. Between August 2020 and June 2021, over 50 groups, over 100 individuals, and 170 university courses representing 90 universities participated in the Green New Deal Superstudio. A complete archive of their submissions is available here. The Green New Deal Superstudio was a joint effort led by the Landscape Architecture Foundation in association with the Weitzman School of Design, the Center for Resilient Cities and Landscapes, the American Society of Landscape Architects (ASLA), and the Council of Educators in Landscape Architecture (CELA).

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[Green New Deal Superstudio on JSTOR](#)

ABSTRACT

The Green New Deal Superstudio ran from August 1, 2020 until June 30, 2021. The Landscape Architecture Foundation (LAF) in association with the Weitzman School of Design McHarg Center, the Center for Resilient Cities and Landscapes, the American Society of Landscape Architects (ASLA), and the Council of Educators in Landscape Architecture (CELA) invited designers to be part of a historic, national initiative to translate the core goals of the Green New Deal—decarbonization, justice, and jobs—into design and planning projects for their respective regions. Participation was open to all design schools, professional practices, individuals, and other design and planning related organizations. Some 670 projects were submitted by participating university courses, groups, and individuals. The Superstudio was an open call for designs that spatially manifest the principles and policy ideas of the Green New Deal with regional and local specificity. A national climate plan like the Green New Deal will be understood by most people through the landscapes, buildings, infrastructures, and public works agenda that it inspires. The Superstudio was a concerted effort to give form and visual clarity to the scale, scope, and pace of transformation that the Green New Deal implies.



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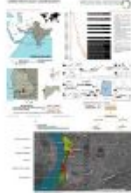
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An Urban Emerald - Nav...

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REIMAGINING REGIONAL L...

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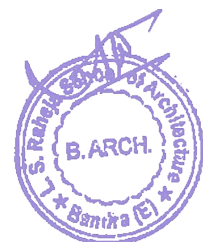
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Impact of a Mega Infra...

Nillesh Deshpande

Part of [Green New Deal Superstudio](#)



Gauri Satam. (n.d.). *An Urban Emerald - Navi Mumbai*.
<https://jstor.org/stable/community.30959341>

An Urban Emerald - Navi Mumbai

Gauri Satam

DESCRIPTION

Navi Mumbai, conceptualized as a satellite city to Mumbai, is today a vital part of the Mumbai Metropolitan Region. Rapidly urbanizing, Navi Mumbai is growing exponentially today. While urbanising, the region had to compromise on its forest cover, depleting its carbon sinks. Agricultural land shrunk, leading to lesser food production, increased food dependency, loss of land and livelihoods. The urbanised areas, consuming massive electricity and fuel have resulted in higher greenhouse gas emissions, leading to urban heat island effect. The proposed Regional Plan 2036, hints that the region will only urbanize further, indicating a compromised quality of urban life, if not rightly intervened today. How do we restore the health of the region? An obvious answer is planning the Regional Urban Greens. This proposal aims at creating a regional network of greens by interlinking urban green patches to the green corridors. Further, the policy envisages the urban greens as potential economy generators, apart from their ecological value, through active public-participation. The Landscape Planning Policy to include:

- Creating Greenways along infrastructural and natural corridors
- Planting urban forests of native species on barren under-utilized parcels
- Creating local food cycles through urban farming, promoting local economy, reducing food dependency, reducing carbon footprint.
- Involving the younger generation in urban greening, through educational programs, crafting responsible future citizens.
- Giving the right incentives and tax rebates to stakeholders and participants.

This policy aims to give Navi Mumbai a new IDENTITY of an URBAN EMERALD by promising its urban dwellers a responsible, inclusive and healthy urban life.



Rashmi Pookkottil. (n.d.). *Forest Restoration of the Matheran Eco-Sensitive Zone*.
<https://jstor.org/stable/community.30959342>

Forest Restoration of the Matheran Eco-Sensitive Zone

Rashmi Pookkottil

DESCRIPTION

Navi Mumbai city is expanding at a very fast pace, and is encroaching upon the region's natural heritage. Forest depletion has been a major concern and the region has lost 50% of its forest cover in the last 30 years. Forests provide us with many ecological services and natural resources and unless forest conservation and afforestation schemes are initiated on a war footing, there will be serious irreversible ecological damages. Many streams originate from uphill and the hills are also catchment areas of rivers like the Ulhas, Dharvi and Gadhi river which are sources for many irrigation schemes and is a major source of water to the Navi Mumbai region. Therefore it is not only critical to restore and protect this area, but also necessary to expand the forest areas with afforestation strategies that benefit the environment, increases natural resources and supports the economy of the region. The Matheran Eco sensitive zone lies to the east of the Navi Mumbai region and is part of the Sahyadri Range. This zone is of immense ecological, economic and cultural value. The forests here are climax forests, with both moist deciduous and semi evergreen trees. It is home to a varied species of flora and fauna, many of which are endemic to the region. This fragile region faces natural degradation of forests due to soil erosion, landslides and rock fall. Increased tourist influx in the region has further aggravated forest loss due to illegal constructions and extensive use of fuel wood.



Swapna Hankare. (n.d.). *Reimagining Regional Landscapes - Navi Mumbai*.
<https://jstor.org/stable/community.30959343>

Reimagining Regional Landscapes - Navi Mumbai

Swapna Hankare

DESCRIPTION

The city of Navi Mumbai, planned to decongest Mumbai, has over the years, seen extensive urbanization as a result of immense connectivity, population growth and improved environmental conditions. It is also rich in natural heritage. Its peculiar coastline is a unique feature and boasts of wetlands and mangroves forming the lungs of the city. These upgrade environmental quality and also host multitude of biodiversity. However, urban sprawl and high land values, as well as anthropogenic factors have led to severe threats to the wetlands. Issues like pollution, siltation from river, destruction by way of reclamations, solid waste disposal and debris dumping, have been detrimental to their ecological character. Insensitivity is also observed in governance, thus explaining landuse transformations, the consequent effect of which on biodiversity could be irreparable and manifold. Local occupations like fishing have been impacted likewise. Wetlands are crucial to reduce, eliminate and mitigate threats for long term sustainable development. They provide vast range of ecosystem services as provisioning, regulating, cultural and supporting services – ranging from shoreline protection, habitat creation, resilient natural infrastructure, healthy lifestyle promoter to sustaining occupations and enhancing aesthetic value of the city edge. The sustainable development goals of the UN, too, focus on wetlands conservation. In view of the same, and having understood the regional aspects of the study region and impacts on this natural treasure, the study aims at addressing conservation through governance and policy formulation for inclusive, sustainable and natural solutions that would reinstate the identity of the Navi Mumbai city..



Nilesh Deshpande. (n.d.). *Impact of a Mega Infrastructure Project: Case of Navi Mumbai International Airport*.

<https://jstor.org/stable/community.30959344>

Impact of a Mega Infrastructure Project: Case of Navi Mumbai International Airport – Nilesh Deshpande

DESCRIPTION

Navi Mumbai was proposed to be a new urban township of Mumbai. The city, meticulously planned and developed since the 1970s, has been growing seamlessly. The value appreciation of a place is decided by the infrastructure of the area, and as an area matures, additions are made to the services to make it more attractive to the actual users. Navi Mumbai, with its close proximity to Mumbai and Pune, was set out to experience a massive infrastructural boost. Thanks to the continually improving infrastructure, the government too, was compelled to improve the connectivity-related infrastructure. Navi Mumbai International Airport (NMIA) is one such initiative by the government of Maharashtra state. A second airport in the region became crucial as the existing airport at Mumbai was fast reaching saturation. A site near Panvel was selected for locating the airport in Navi Mumbai as part of the CIDCO initiated study. The NMIA is a proposed greenfield international airport to be built approximately 35km from the existing Mumbai airport. The pre-development work for land creation involved the relocation of settlements within the project area, reclamation of wetlands, blasting and levelling of the Ulwe hills, training of the Gadhi river and the diversion of the Ulwe river for the airport. The Ulwe river diversion has resulted in the neighbouring villages outside the project area getting flooded, forcing their residents to temporarily relocate during the monsoons. The study involves looking at the river and its neighbouring development and forming policies for the improvement of the area.



Jui V Choughule. (n.d.). *PROPOSAL FOR MITIGATION OF WATER POLLUTION THROUGH COMMUNITY WATERS A WAY AHEAD FOR NAVI MUMBAI REGION.*

<https://jstor.org/stable/community.30959345>

Proposal For Mitigation Of Water Pollution Through Community Waters A Way Ahead For Navi Mumbai Region - Jui V. Choughule

DESCRIPTION

Navi Mumbai was planned as a twin city to Mumbai in the 1970s to ease out Mumbai's urban growth. The region spans between two biodiversity hotspots, the Matheran Hills and the Thane Creek. In spite of being a region with high rainfall alongside a network of water bodies, the city of Navi Mumbai is now facing challenges of water scarcity. Many reasons contribute towards polluting these regional water resources. Though people in this region are living or working along these water bodies, there is a distinct disconnect that they have with surrounding water resources. As per the future plans of MMR 2036 and NAINA proposal, there is further increase in urbanization in this region leading to additional pressure on these limited constrained water resources. The policy looks at evolving a regional setting which is free of water pollution, which optimizes its own water to fulfil the needs of existing as well as upcoming urbanization. The proposal aims at keeping the regional water resources intact, clean and healthy, wherein no effluents will be released in these water bodies. Proposing alternate techniques to recycle & repurpose the untreated or poorly treated wastewater via landscape solutions. This would establish a connect with immediate neighbourhood, acting as Community Water. Rather than having bigger infrastructure on and around water resources, water can have greens that can help the city purify their wastewater produced and reuse it. The policy aims to make the region of Navi Mumbai self-sustainable in terms of its water needs.



Abhishek Chakraborty. (n.d.). *Policies for Mitigating Environmental Degradation and Rehabilitation of Open Cast Basalt Quarries*.

<https://jstor.org/stable/community.30959346>

Policies for Mitigating Environmental Degradation and Rehabilitation of Open Cast Basalt Quarries - Abhishek Chakraborty

DESCRIPTION

The study of Navi Mumbai region on the basis of several natural and manmade parameters brought forward issues related to environmental degradation due to exploitation of natural resources attributed to rapid urbanisation. The 15 km long Parsik hill range is a reserved forest, which forms the eastern edge of the study region, plays a key role in dictating the wind patterns, micro climate and hydrological regime of the region. It is a local biodiversity hotspots and home to several faunal and floral species apart from having religious and cultural markers. The exposed rocky outcrops of the Deccan traps coupled with high demand of stone in construction industry have led to intensive quarrying of the western slope of the hill over the past four decades, some of it being illegal. Rampant quarrying has resulted in large scale deformation of land, loss of forest cover and habitat, change in hydrological regime, soil erosion, unstable slopes and visual scar apart from environmental pollution concerns. Due to legal intervention, quarrying stopped in 2017 leaving behind acres of degraded land. The study reviews the existing policies governing quarrying of minor minerals in Maharashtra to understand if the present situation is a result of ill conceived policies or inadequate considerations for rehabilitating such abandoned quarry sites. A policy framework is suggested which suggests necessary additions and modifications to existing clauses and elaborates on good practices for rehabilitation of exhausted quarry sites, especially in the context of Parsik hill which poses unique topographical challenges in restoration techniques.



Tasneem Badri Jaity. (n.d.). *REIMAGINING REGIONAL LANDSCAPES - NAVI MUMBAI: PROPOSAL FOR FISHING COMMUNITY "MICRO-WORLD WITHIN A WORLD."*
<https://jstor.org/stable/community.30959347>

REIMAGINING REGIONAL LANDSCAPES - NAVI MUMBAI: PROPOSAL FOR FISHING COMMUNITY "MICRO-WORLD WITHIN A WORLD" -Tasneem Badri Jaity

DESCRIPTION

The expansion of Navi Mumbai urban areas to meet the ever-increasing demand for land has resulted in extensive reclamation of low-lying areas, especially the wetlands, owing to which most of the wetlands in the urban areas are hastily being vanished and correspondingly affecting the fishing communities of the region who are the substantial stakeholders in this industry. Fishing colonies can be found all over the coastal edges of Navi Mumbai. The edges of the creek on the Navi Mumbai coast were used as fishing ponds & salt-pan lands for almost three hundred years. The Kolis and the Agri-Kolis are the novel residents of the city and were involved in traditional fishing but with urban expansion, their occupation is not feasible anymore. The indiscriminate reclamation of the wetlands surrounding the creek is done in either planned or informally encroached processes. Due to domestic and industrial activities, the waste generation and disposal pressures have further subsidized to the deterioration of coastal marine water quality along with coastal fisheries. Though several attempts have been made by local government to recover the coastal environment, this is vulnerable by uncontrolled growth of population and economic activity of the region. The development of fishermen community needs to be recognized as a vital element of fisheries advancement and an essential condition for encouraging sustainable fisheries. There is an urgent need to initiate the precautionary measures to preserve the ecological balance of the damaged areas of wetlands. Eventually, ensuring the furtherance of both flora and fauna.



Learning from the Legacy-Case of Kalyan

ORIGIN DESCRIPTION

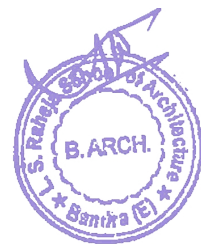
This studio engages the students with studies of experiential and cultural content of lived landscapes - the present or past or both and develop a process for intervening in them. This includes physiological, functional, and psychological factors that affect the experience of landscape as well as the study of cultural values, attitudes, and philosophies that have shaped historic and contemporary landscapes. They also study factors that affect social interaction in community and public spaces; perceptions and needs particular to various sub-populations; ecological, social, and cultural approaches to theories of place and place attachment. A Cultural Landscape is a geographic area that includes cultural resources and natural resources associated with the interactions between nature and human behavior. This is true of almost any place in varying degrees. Students thus develop an understanding of how successive societies leave their cultural imprints on a place each contributing to the cumulative cultural landscape. A cultural landscape can be associated with a person or event. It can be thousands of acres or a tiny homestead. It can be a grand estate, industrial site, park, garden, cemetery, campus, and more. It is about the meaning people invest in their landscape.



Rohan Patil. (n.d.). *Learning from the Legacy-Case of Kalyan*.
<https://jstor.org/stable/community.30959348>

DESCRIPTION

'Patri pool' once a proud symbol of the glorious and flourishing period of the British Raj, is now reduced to a mere memory for the people within Kalyan. Once again a city has lost one of the major cultural landmarks from history. In the race of being global, Kalyan is taking a new garb, but in doing so, is losing its cultural identity and local essence. The river Ulhas, once the entrance to the city is now polluted, symbolic of the City neglecting its available resources. With rapid growing population and congestion, the City lacks open spaces. Where people celebrate their life, spend valuable family time, have their morning walks or evening strolls. City needs a pioneering, multifaceted, and dynamic space for the locals; which becomes a platform for exchange of culture, traditions and ideas. A space that shall celebrate Kalyan's diverse history and lays the foundation for a new found identity for its people. A space that shall remind and reinforce the importance of ecological revival. And when responsibly designed, even a garbage dump can be remediated to a lush green oasis; an important cultural marker for the future Kalyan. The design intervention aims to bridge the gap between city and its River, the past and the present, people and their culture, and the built and the unbuilt. A united haven for Nature and people to flourish.



Napoleon Ferdinando. (n.d.). *Learning from the Legacy-Case of Kalyan*.
<https://jstor.org/stable/community.30959349>

DESCRIPTION

A pre study of Kalyan shed light on its geographical setting, physiography, cultural importance, demographics, traffic patterns and future development plans. Its rich culture stems from the river giving rise to trade and shipbuilding industry. Its heritage set within its historic fort, temples, mosques and Wada's. It's diverse population drawn towards the city. On layering this information and looking at various potential sights through different lenses one is able to identifying the needs of the city, and the ideal location to support it. Kalyan has grown from various nuclei into today's present city. The urban forest provides for open space to build relations with nature and its elements while assisting with decarbonization. Restoring the riparian edge and creating a boardwalk to re-establish man's bond with the river, and revival of river ecologies. Associating the people with their cultural heritage and providing space for new cultural values to be formed, while encouraging community growth and interaction. The grove, the community gardens and the central plaza provide for a large range of mixed activities like open markets, schools, parades, festivals and local events. Gardens that pay homage to the glories of the past and provide for dreams of the future. The site functions as a nucleus constantly attracting, growing and providing for the city. Kalyan owes its open spaces to the future thinking Kings of the past, and its troubles to its current inhabitants. In the words of Robert Heinlein "A generation which ignores history has no past and no future."



Anuj Gudekar. (n.d.). *Learning from the Legacy-Case of Kalyan*.
<https://jstor.org/stable/community.30959350>

DESCRIPTION

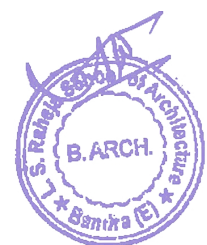
A port city, known to provide a fascinating and rich understanding of the movements of people and goods, is an exchange of cultures ideas and practices. The evolution of Kalyan as one of the important ports of the ancient India highlights the inheritance of the claim witnessing an exchange of cultural values through the process of trade, colonization, reconciliation, and relocation. The design approach for Kalyan specifically entails to question the 'Open spaces' as per the "Smart City Development" and reinvigorate the need to look at parks and public spaces as unifying attributes for a stronger cultural integration. The Park intends to address the vital issues of resilience against climate change, ecological and sensitive upgradation, land conservation and carbon sequestration, remediation of hazardous waste and inclusivity in design. The historical cultural marker - Durgadi fort, which stands its ground for cultural integration with the temple for the goddess Durga and the Eidgah wall, has been envisioned as a starting point, appreciating context with the river. The trail traverses through the underpass of the newer development onto the park which deals with integration of the inheritance and ecological remediation integrating the present cultural identities of the city. The design addresses phase wise remediation of the dumping site through a bio-mining process, improving the ecology and land value. This process allows access to the larger landmass which is then specifically designed to alter the perception of the city through a pilot project- bringing about an exchange with an ecological and social intervention.



Digbijoy Shil. (n.d.). *Learning from the Legacy-Case of Kalyan*.
<https://jstor.org/stable/community.30959351>

DESCRIPTION

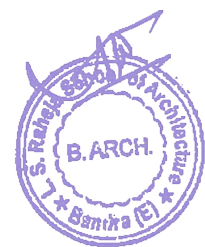
Kalyan is an ancient port city of India and ruled by different rulers since 2nd BCE. Each of these rulers left a tangible and intangible impression on the fabric of Kalyan city. Kalyan city is a riverfront development and it always shows the value of land and river. As an inland port city it always expedites socio economic growth and cultural interaction of different communities. Affluent history, cultural solidarity and rich location helped the city to protrude differently. This project started with classified the delineated site with classified headings which helped to know the parameters of basis design intend and activities. Meanwhile from site perception, threshold established as an essence in the proposal through division, separation and partition. Pre-study of Kalyan city assists to jot down key elements as strong bong among people, great Indian peninsula railway, port, talao (pond) , fishing culture, weaving, bastions, moat, ship building activity, brick kiln, Wada and water. Questions and provocations built up the design foundation as in what if the highlands looked at each other? How can add up elements to bridging the gap? How to maintain connection with water throughout the site? How can increase the importance of Ulhas river? Where can the threshold work to redefine the site as a part of the legacy of Kalyan? How to accentuate historical awareness? Surveys with different age groups of Kalyan substantiate viability of the program. This proposal focuses on rejuvenating the legacy of Kalyan with the aid of storyline to transform urban land into cultural landscape.



Minal Gajjar. (n.d.). *Learning from the Legacy-Case of Kalyan*.
<https://jstor.org/stable/community.30959352>

DESCRIPTION

Emerging because of its relationship with the Ulhas, the city of Kalyan has coevolved with the river so symbiotically for the past centuries that every milestone in its history has been tied to the river. Centuries of floods created fertile land for the early settlers, and water safeguarded the city. Kalyan being in the center was bridging a gap between the traders coming from the Arabian sea to the hinterland through tributaries of Ulhas. This strategic location played a very important role in the evolution of Kalyan and its identity as an inland port. Kalyan, one of the biggest cities in India by population, experiences a warm and humid climate. City encompasses natural and cultural treasures of its rich heritage history. Expanding city trends are disconnecting city with its identity, heritage and cultural association, the factors which generally bind people and nature. This loss is visible in the city in many ways. The project investigates the possibility of reviving the cultural identity of the city and its association with the Ulhas River. It envisions integrating people, culture with nature, hence confluence which will merge boundaries to create a single identity and re-establish an Image of the city. By developing strategies that are embedded from a socio-cultural relationship with water, the proposal tries to celebrate the cultural ties between humans and the landscape.



Heena Gohil. (n.d.). *Learning from the Legacy-Case of Kalyan*.
<https://jstor.org/stable/community.30959353>

DESCRIPTION

The Kaylan developed as a port city where its importance due to trade led to the social, economic, and cultural foundation of the city which eventually got lost by the course of time and people started losing their connection with the river and the city's rich past and culture. The aim of the design is to develop the waterfront at Kaylan as an inclusive space to enhance the image of the city by emphasizing culture, sports, and natural environments. Park is designed to create spaces to escape, engage, and explore while experiencing g and learning about the extraordinary history of Kaylan along with restoring natural systems. The river, temple tanks, step wells had integrated a number of uses earlier other than the source of drinking such as cultural celebration, a place for socio get together, RWH, groundwater recharge, etc. But now urban land pressures are causing construction over catchments leading to degradation of tanks and wells leading to water shortages in Kalyan. So rebuilding a new modern bonding between the water and people where the river will become the heart that connects the community and natural habitat which would improve the quality of life and allows the community to interact by creating new life experience and celebration spaces and share the flow of nature. Botanical garden, Community farming, Meditation area brings people from various age groups and cultures together and forms a place of exchange of knowledge, goods culture, and values. The video shows the present and past condition of Kalyan city. It also shows the key points of past that lead to inspiration in designing the project. The project aim at rebuilding a new modern bonding between water and people where the river becomes the heart that connects the community and natural habitat.





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H O N E S T Y



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PROTEAN LIVING ADAPTING TO THE CLIMATE CRISIS

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ABSTRACT

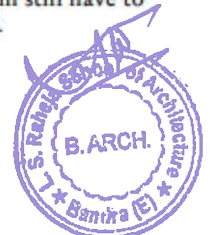
The timescales of the Earth's climatic processes are slow. Even in the best-case scenario, if we cut down all carbon emissions by 2050, we are still looking at 1.5oC of warming. Presently, at 1oC of warming, and 415 ppm of carbon [1], these impacts are already catastrophic. As these numbers translate into real life climatic disasters, people across the globe are in search of safer lands and better opportunities. However, not all communities have the same capacity to move away, and those in fragile areas, who have had minimal contributions to this problem, and are living in poverty are most vulnerable to the impact of these changes. We need to bring to realisation, a world where everyone has the ability to combat this crisis.

The objective of this dissertation is to study the impact of the changing climatic patterns on the people on the frontlines in India, specifically the coasts. The study also looks at adaptation tactics across a wide spectrum- from indigenous techniques to modern technology. It also explores methods of polyvalent adaptation, including the scope of migration as a strategy. The dissertation assesses the scope of the built interventions in adapting to the crisis.

To face the greatest threat of our generation, we have to learn to adapt. Today, there is a need for new infrastructure with the ability to adapt to this new normal, to be designed and constructed. The framework for this infrastructure has to be polyvalent, in meeting current needs and building capacity to tackle future events. The dissertation proposes the use of anticipatory design strategies that are regenerative, and pliable and amphibious architecture that engages with the environment.

INTRODUCTION

Human beings are the only species to have existed for such a short period on earth and altered it so significantly. The early human beings knew to live symbiotically, but that relationship soon morphed into one of discord as the anthropocene progressed. The human impact is so much that we have managed to alter the earth's atmosphere. The Inter-Governmental Panel for Climate Change warns us of the precarious effects of allowing an increase of the global temperature by even 1.5°C above the pre-industrial levels (Masson-Delmotte et al., 2018). Even at 1 °C rise, we are experiencing the impacts of climate change. From increases in global average air and sea temperatures, the widespread melting of ice and the permafrost, the intensification and high variability of extreme weather events, rainfall anomalies, desertification, the acidification of the oceans, and the rising average global sea levels. We have changed the environment so much that we have set a mass extinction into motion. A World Bank report estimates that climate change will transform more than 143 million people into 'climate migrants' escaping crop failure, water scarcity, and sea-level rise by 2050 (Rigaud et al., 2018). Even if we manage to limit the global average temperature rise to 1.5 °C, we will still have to deal with the irregularities it will cause.



NEED FOR STUDY

Elasticity (noun) : the ability of an object or material to resume its normal shape after being stretched or compressed.

Everything has an elastic limit. When pushed too far, that limit is reached, after which the onset of permanent alteration begins. This is known as a tipping point in the climate system. The catastrophic onset of life-altering events has already begun.

Whether we look at small island nations such as Kiribati or larger deltaic areas such as the Sundarbans, we see the plight of their inhabitants- losing houses and sources of livelihood, living on the edge of poverty. What is often found in common amongst these climatic hotspots is that they are the early sufferers of this human-induced disaster despite having a minuscule contribution to the cause of the crisis. The impacts of this climate emergency are going to exacerbate existing vulnerabilities and marginalise the marginalized.

In cities, we see gross mismanagement of resources. From building insensitivity over natural catchments to ill-planned infrastructure of cities. All of this has a cumulative impact on the overall resiliency of the city and its surrounding areas. The further construction of 'fortress-like' projects that keep natural disasters and environmental changes at bay temporarily instead of integrating them into the infrastructural fabric is doing more harm than good. In order to face the greatest threat of our century, it is essential to adapt to change.

AIM

The aim is to integrate the emerging environmental, social, and economic challenges into future resilience planning. The intention is to re-imagine living in a new normal of increased natural calamities, food shortage and water crisis through anticipatory methods that are humane and endurable, and to create alternative methods of sustenance.

HYPOTHESIS

The current efforts toward global climate action do not look promising. In order to survive the inevitable: higher temperatures, droughts, rising seas, fiercer storms, more unpredictable rainfall, and more acidic oceans, we need to design a climatically adapted society- where instead of resisting change, we Anticipate and Adapt.

METHODOLOGY

The initial background study was conducted using existing research papers and data online to understand the climatic hotspots of India and their geographical and climatic timeline. Following this, live case studies were carried out at identified sites: 5 coastal settlements in 24 South paraganas in West Bengal, including Bakkhali and Beguakhali and Devbag in Maharashtra. To carry out the study, at least 10 residents

were personally interviewed in each village. The aim of the survey was to understand the socio-cultural and economic practices of the communities and the direct and indirect distresses caused due to the climate crisis. In 24 South paraganas, this also involved mapping the impact of previous cyclones and understanding the subsequent adaptation techniques. In Devbag, the first study focused on understanding the social and economic fabric of the village. All the live case studies pointed towards a grave problem of water. During this period, existing impacts of environmental and anthropogenic changes on communities using available data and satellite images were mapped out. Local, traditional methods of combating natural adversities and understanding the ecosystem's regenerative processes were also studied.

Online case studies were carried out to study various techniques of adaptation which included nature-based solutions such as wetland restoration, Sponge Cities, CALTROPe and soft infrastructure; infrastructure solutions such as Climate Tile, POP-UP: All-purpose flood shelter; investigation of native techniques which was done through live case studies; and exploration of migration as a design strategy through existing projects.

All these studies concluded that Devbag, Maharashtra would be an ideal pilot village as it represented many coastal villages in India. In that, the village, like many in India, has turned its economic base away from fishing towards tourism. It is a peninsular sand-spit of a gradual ever-changing nature. Devbag is situated on a 3.5 km long extended piece of land that projects from Tarkarli. The peninsular land lies between the mouth of the Karli river and the Arabian sea. The village is at an approximate elevation of 5 metres above the mean sea level. This means that it is susceptible to rising sea levels. Along with that Devbag has seen a steep rise in the number of environmental events and the destruction that ensues.

Field visits were carried out that focused on identifying potential sites for intervention through interviews and consultation with the residents, local experts and local bodies. These site visits revealed more information about the polluted groundwater table, and a gradually receding coastline. Factors that were studied included topography, historical landform changes, salinity of soil, sea level rise as per the IPCC SR6, mapping of existing infrastructure, wind analysis and impact of previous environmental events. All of these factors led to the generation of a vulnerability mapping that identified 3 sites on the village.

DISCUSSION

The climate breakdown is a process whose outcome is unknown. This situation has no precedence. Adaptation therefore has to be polyvalent. Durability and functionality of structures need to be reassessed, especially their purpose and reaction with the environment. People on the coasts have a better grasping of water than anyone else. Interactions with water are

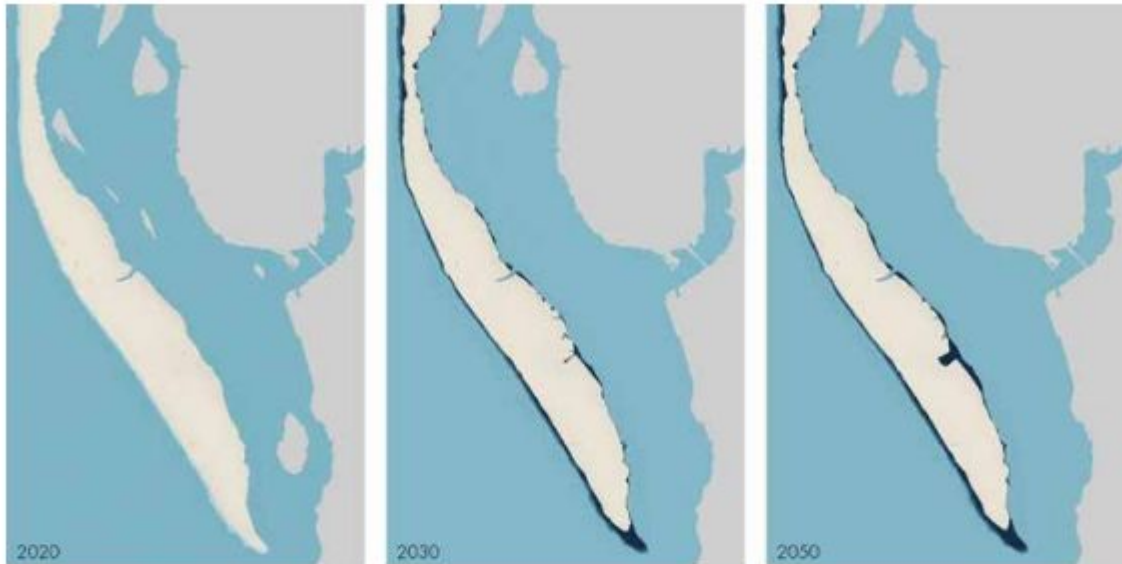


Figure 1- Mapping of sea level rise as per the IPCC SR6



Figure 2- Infrastructure mapping of Devbag (by Author on the base of Google maps)



Figure 3- Mapping of soil salinity (Source: Pisolkar (2008))

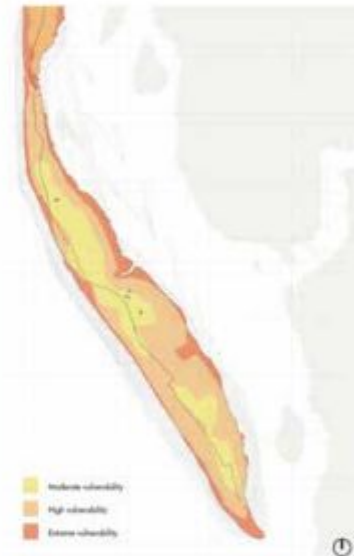


Figure 4- Vulnerability mapping (by Author on base map by Pisolkar (2008))

tegrated into their socio-cultural and economic fabric. For the viability of any design proposal in this context, it is crucial to understand and interact with water. An important outcome of all case studies was the interdependency between the two types of water- fresh and salt. The salt water provides the residents of Devbag with their livelihood while the fresh water enables their survival. Where there is too much water, there is also very little water. The design proposal harnesses this to suggest small scale interventions that are woven into the ever-changing nature of the village and the water. The proposal looks at protean living. It incorporates the ideas of regenerative systems, the pliability of structures and amphibious building to propose a de-

sign that modifies and enhances existing public infrastructure in the village to make it resilient, for it to act as a shelter when disaster strikes, and to function as a refuge when the time for migration comes.

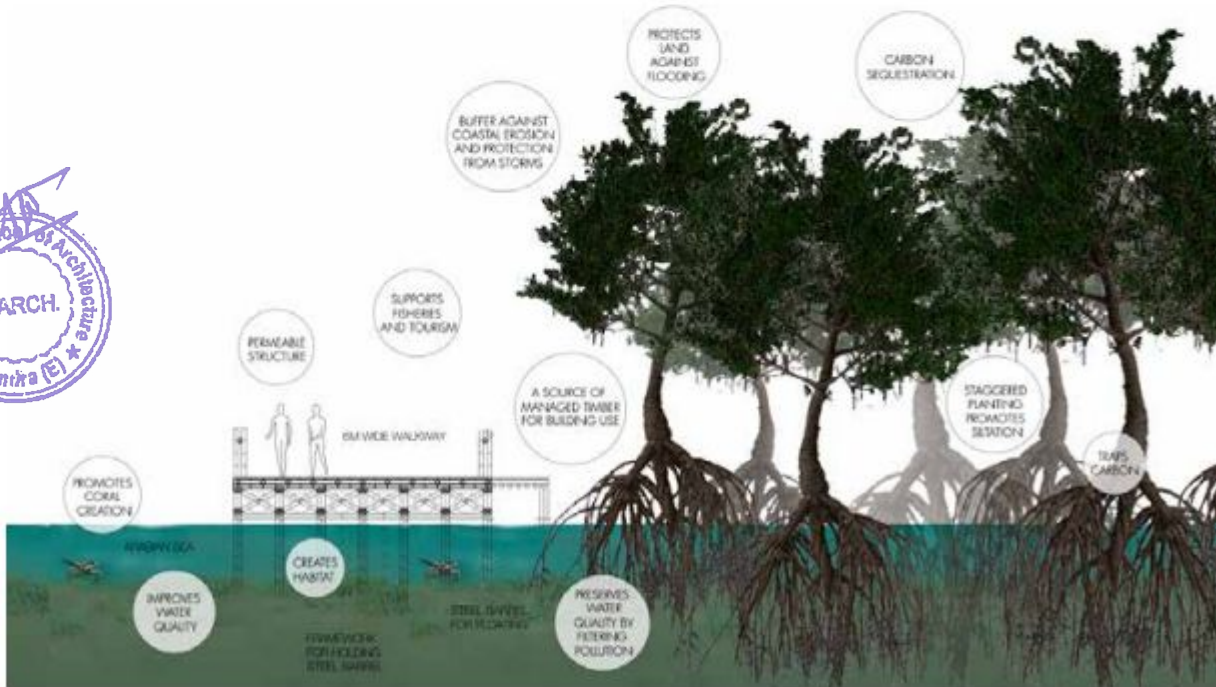
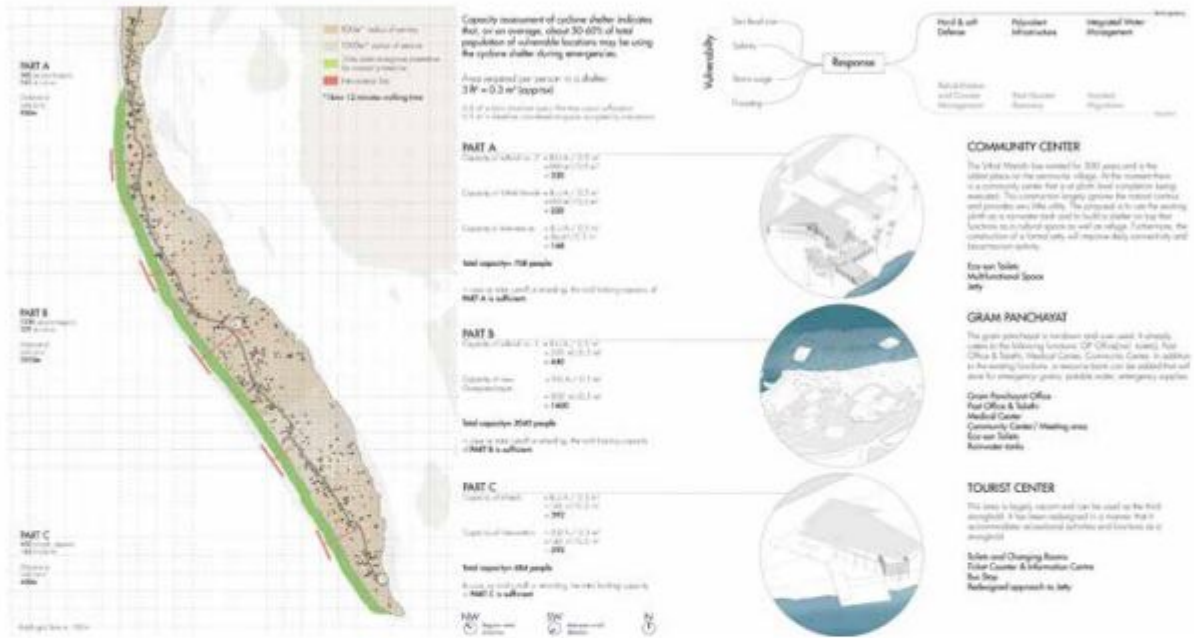
Regenerative systems are systems that not only help with adaptation to the climatic changes, while reducing impacts; they also try to mitigate the issues. A classic example of this is wetlands barriers. Pliability of structures refers to the flexibility of both structures and of the people. It heavily emphasises on the concept of going with the flow. For structures, it implies that the architecture has to be flexible. It needs to allow for the forces of nature to mould it. For adaptation it means that migration has to be looked at through a different

lens. Seasonal migrations should be encouraged and looked at from a new perspective. Amphibious nature refers to the ability to live on both land and water. In the context of climate adaptation, it refers to architecture's ability to engage with water.

While viewing adaptation through the lens of the built environment, anticipatory design strategies are more pivotal than reactive design strategies.

RECOMMENDATIONS

The design draws on the knowledge of sociological, economic, cultural and traditional systems of Devbag which are deeply rooted in the concept of 'living with water'. It assumes - on the basis of previous studies - that the peninsula will eventually disappear and makes recommendations for this process. The design proposes a network of soft and hard infrastructure that will provide support for, and navigate through this process of



Top: Figure 5- Design proposal for Devbag (Source: Author)

Bottom: Figure 6- Proposed wetland barrier and walkway as a method of regenerative adaptation (Source: Author)



change. The design will be such that it functions in three main scenarios:

- ❶ Predicted changes
- ❷ Natural disasters such as cyclonic events
- ❸ Once-in-a hundred-year event which will lead to migration

The proposal is to modify and enhance existing public infrastructure in the village to make it resilient, for it to act as a shelter when disaster strikes, and to

function as a refuge when the time for migration comes. The program is to meet the present needs of coastal communities and increase their resource independence, especially with regards to potable water. It also addresses issues of increasing tourism, which has become a part of daily lives, such that it does not catalyze ecological damage. The new infrastructure enhances the existing quality of life in aspects of health care, social and cultural gatherings and economic activities.



Top to Bottom: View of the community centre on part A; View of the gram panchayat at part B; View of the tourist centre at part C (Source: Author)



As a part of the overall resilience of the village, the design proposal is a wetland barrier that integrates the functions of coastal defenses and public space. This barrier will span the entire western coast of the village, i.e., 3.5 km stretch with intermittent pockets of an amphibious walkway that gives access to the Arabian Sea. This walkway will function as a promenade for the locals and tourists and as a boat anchor for the local fishermen.

The wetland is rooted in the idea of regenerative systems. They will react to the challenges of the changes in the environment and minimize them. This will function as a carbon sequestration system, and absorb carbon. It will promote coral growth and provide a habitat for fish along with improving water quality. This will in turn promote self-sustenance both ecologically and economically.

The village is divided into three parts of 10-12 minutes of walking distance from the 3 sites. These sites have public structures situated at the highest ground in that region that will act as evacuation points. In part A, the program proposes a community centre near the Vithal Mandir and school no 2, in part B, there is a proposal of a new polyvalent gram panchayat and in part C, the proposal is to build a tourist centre and a jetty.

All architectural interventions in the proposal engage with both seawater and fresh water. The modifications to the existing built infrastructure include creation of water reservoirs to store water harvested from the monsoons. All three structures are made such that they rise and fall with the tidal frequency of the river and the sea. They are designed keeping in mind the wind velocities and directions. All roofs are designed aerodynamically, ensuring minimal impact of the stability and security of the structure. Around these structures, it is recommended to explore the process of phyto-remediation which entails planting shrubs and plants of variety that extract soil from the water and improve the groundwater table. The structures will be made out of locally sourced materials that will disintegrate alongside the landform.

CONCLUSION

The climate crisis is the greatest challenge of our generation. It will exacerbate existing inequalities and create new ones. Architecture can no longer function in isolation and disregard the environment. The biggest problem with designing in isolation, is the creation of hard infrastructure such as embankments, is that they disrupt the existing delta and their smooth concrete surfaces are detrimental to the natural processes of siltation and erosion of landforms. All and any design strategies therefore need to be woven into the landscape. In order for us to combat and overcome the crisis, we need to look at inclusive design that penetrates through different strata and provides a fair chance at survival to all.

Endnotes

[1] The Mauna Loa Observatory in Hawaii, which has tracked atmospheric CO₂ levels since the late 1950s, on May 11, 2019 detected 415.56 ppm of CO₂.

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