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Ar. Anand Palaye

EDITORIAL

Dear fellow architects and readers,

We are now nearly halfway through the year 2020 and are learning to cope with the new normalities presented by Covid-19 such as lock downs, work from homes, digital communications and so on.

The alarming spread of this new virus coupled with the initial non-availability of a remedial and testing systems, forced the authorities to clamp lock downs to ensure a break in the chain link of this pandemic. Compared to the rest of the world our nation has fared rather well in this painfully tough period.

Working from home has come about as an effective response in most fields of activities thanks to superior digital communications available to the common man. We all need to follow a very regimented routine in our daily life and make most of the time saved due to no work-related commuting and use this time to enrich our lives smartly using this invaluable commodity.

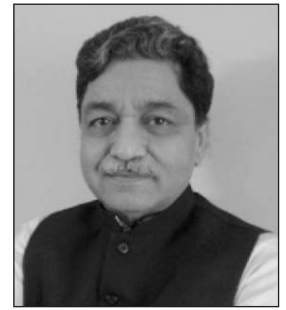
We architects have squarely responded to this challenge, even important meetings are now routinely held electronically. We at the IIA are taking this further by planning a first of its kind digital national convention in the beginning of July 2020 which will see participation both from India and many other countries of the world.

Continuing our inclusion of contemporary and relevant topics in the journal, in this issue we have papers and articles that tell us about efforts being taken for **Revitalizing Art in Ladakh; relevance of art and artworks in architectural spaces and how to help artists in this direction, A case study of how to prepare a house to face this pandemic, Effects of invasive plant species in a National Tiger Reserve and a synopsis on design process of National Institute of Design at Bhopal and a report on an excellent essay competition held by IIA Karnataka on this pandemic outlining prognosis its effects on future works. Also featuring the Winning Entries of Students (National Design Competition for Students of Architecture) initiative by Kaarwan in collaboration with The Indian Institute of Architects.**

Once again, we appeal to all our members and readers to follow the guidelines issued by authorities and stay safe work towards creating a better environment for our future generations.

Ar. Anand Palaye

Chairman - Publication Board & Executive Editor, IIA



Ar. Divya Kush

PRESIDENT'S MESSAGE

Dear Fellow Architects,

Warm Greetings,

With each passing day the Covid-19 continues to spread at an alarming rate with no visible remedy in sight except to stay home, maintain social distancing, washing hands & generally maintaining a high level of personal hygiene.

It is a matter of great satisfaction that, members of our fraternity are responding to the challenges arising out of the Pandemic Covid 19 in a very commendable manner not only for themselves but equally so for other fellow professionals.

It is also heartening to note that the members of our fraternity across the country are extending all possible help to the most affected sections of our society both in terms of their personal efforts, financial & material & contributions.

Apart from interesting & well researched projects & papers in this edition, it covers the prize winning entries of a **National Design Competition for students of Architecture** titled "**Quarantine Facility - Design for Temporary Healthcare**" organized in association with IIA by **KAARWAN**.

I am sure you will find the contents of the edition very interesting & useful.

Wishing you all good health.

Jai Hind

A handwritten signature in black ink that reads "Divyakush".

Ar. Divya Kush

President,

The Indian Institute of Architects

National Institute of Design, Bhopal



Ar. Mitu Mathur - Email : media@gpmindia.com

Ar. Mitu Mathur is a graduate of Sushant School of Art & Architecture (SSAA), Gurgaon and completed her Master of Science in Architecture & Urban Design from GSAPP (Graduate School of Architecture, Planning and Preservation), Columbia University, New York City. She has taught as a visiting faculty at the Housing and Urban Design studio at SSAA. Recipient of several prestigious awards as a student, she continues to question the current notions of architectural development in developing cities. She also received the second prize for Katha Asia Urban Design Slum Upgradation Design Competition; and has won the prestigious Kinne Fellowship from Columbia University for 2010.

Mitu Mathur has been associated with the firm since 2006, managing the business development of the firm and is responsible for expanding and professionalizing GPMA's activities. A recipient of many awards, she questions the current notions of architectural development in cities. Mitu leads the team of design research at GPM, exploring the evolution of design in Indian cities. Bringing expertise in urban design, she leads landmark projects like Netaji Nagar and Sarojini Nagar Redevelopment. An active member of the architecture fraternity, she has been a part of prominent discourses both nationally and internationally.

From being known as the city of Lakes with a striking blend of religions, Bhopal is amongst the greenest cities of India. Along with unparalleled scenic beauty, the city is home to some of the best institutions of national importance, Maulana Azad National Institute of Technology (NIT), AIIMS, Indian Institute of Forest Management (IIFM) to name a few. As an imperative response to design and innovation taking prime importance in many sectors, policies, and schemes of the government, February 2019 marked the inauguration of National Institute of Design in Bhopal.

Responding to the Institute's aspiration in bringing about design-based education reform in the country, the spatial design of the campus aims at maximizing opportunities for interaction, engagement and cross-fertilization of ideas between different creative disciplines. Spread over 30 acres of land, and located in the industrial region of Achar Pura district,

the challenges of a contoured site and uneven soil conditions were used as an opportunity to envisage an academic hub that evolved with the optimization of the natural slope. The site planning adopts a landscape-integrated approach, where the placement of built volumes respects climatic factors to create a comfortable and visually aesthetic environment. The thoughtful conceptualization of the campus layout is rooted in the NID logo, with triangulation finding manifestation in both two and three dimensions.

The design emanates from the premise that institutions are not isolated entities in their own context. They form an environment, a precinct, or neighborhood-supporting community activities that are crucial for all academic institutions. The students and faculty get the opportunity to learn both inside and outside the studio space, being engaged in an integrated process of designing, developing,

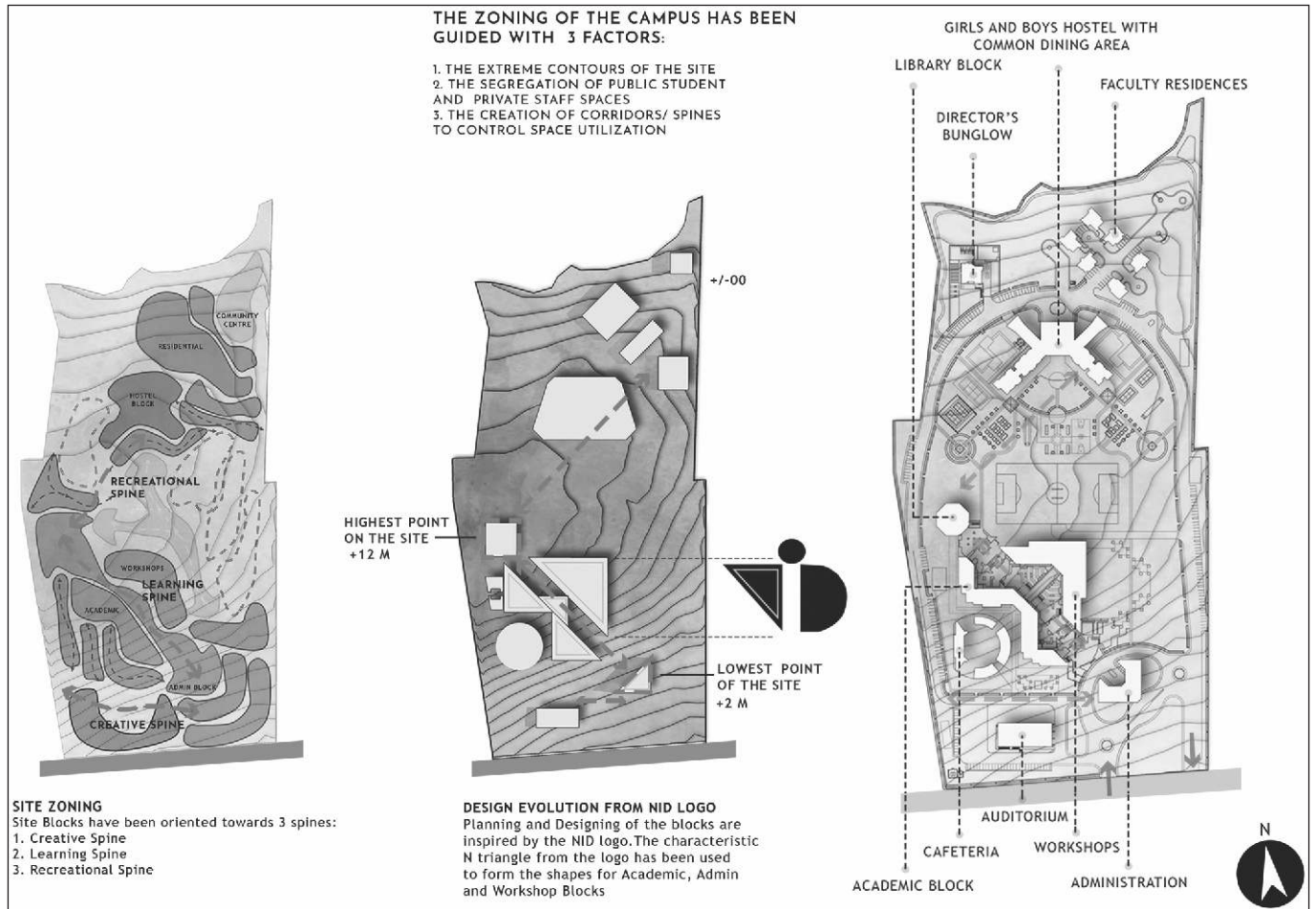




constructing, and operating state-of-the-art buildings that will, in turn, influence them to adapt their own behavior when they occupy it. Echoing the pretext, the 'Creative Spine' forms the key feature around which spatial planning of the entire campus has been developed, enable placement of built volumes to ensure minimal conflicts in the circulation patterns of different users. The entrance drop-off is greeted by the administrative block that houses directors and officers, in order to create a grand impression on the visitors' minds. Upon transcending the admin block, one witnesses the creative spine, designed as a series of interactive nodes and landscape plazas, flanked by studios and classrooms on one

side and workshops on the other, that aim to foster a rapid exchange of intellectual and technical knowledge. The semi-open circulation corridors, dawning by a canopy, link and penetrate the volumetric platforms of the academic blocks, allowing spaces to broadcast a collaborative nature of design.

The interiors of the classrooms and workshops have been carefully designed, keeping at par with the requirements of a new-age design studio, making them collaborative, interactive and adaptable, thereby deviating from a pattern of conventionality. Workshops are designed as double height spaces to accommodate heavy machinery. The academic area

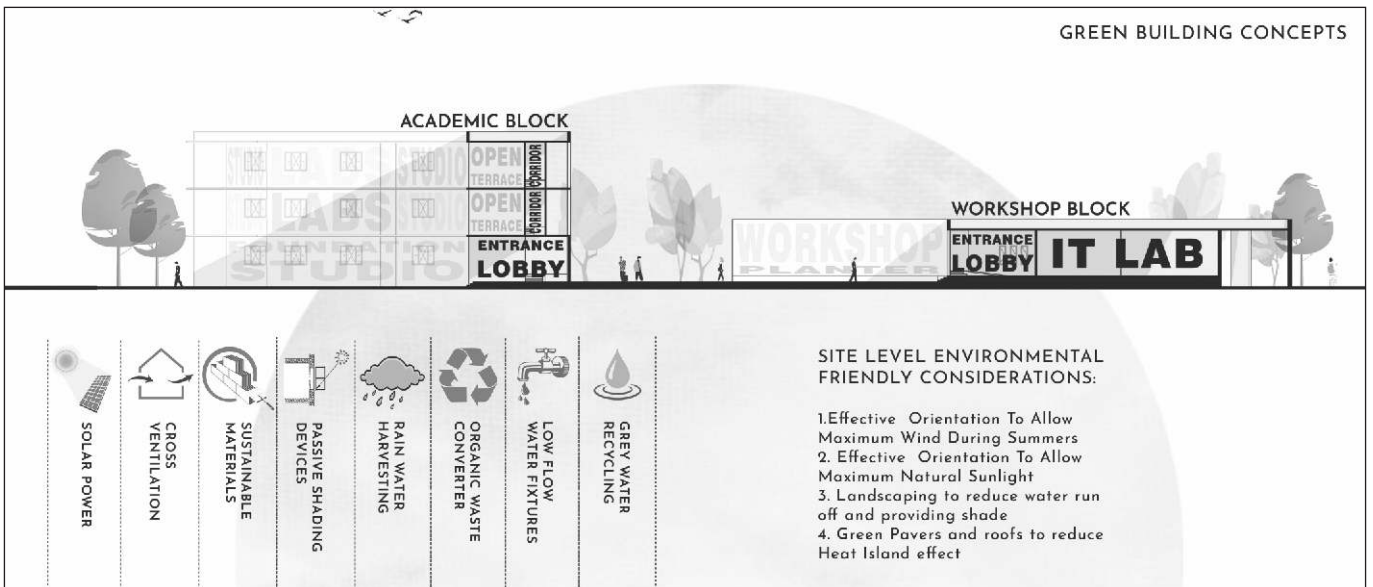


is closely connected to hostel accommodations; both the girls' and boys' hostels are segregated by a common mess and a health center offering recreational facilities such as a gymnasium with steam room, indoor sports club & yoga space on the terrace. The residential accommodation for professors and teachers has been dually segregated from the hostel blocks to ensure privacy. The academic and hostel blocks are

pierced by the sports facility, housing a football court, tennis court, basketball court and a jogging track for the students. A dedicated auditorium has been designed in close proximity to the academic block and the library, with provision of a separate parking for 500 ECUs. Additionally, the amphitheater, meant to act as a congregation spot for events, adorns a veil of landscape, housing a cafeteria underneath.



GREEN BUILDING CONCEPTS



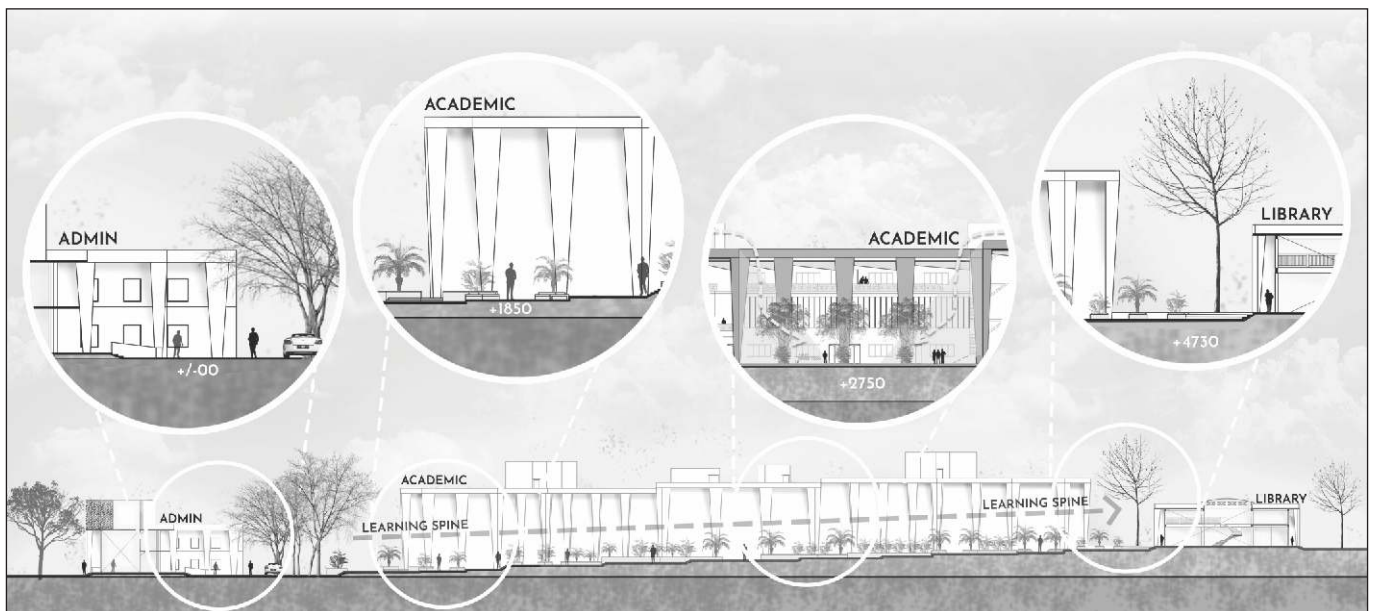


The path from the administrative block to the library, located at the highest point on the site, is punctuated by an elaborate, stepped landscape, aesthetically and functionally accentuated by planters that double up as seating spots for the students as well as the faculties. The idea was to create spaces that reinforce the students' individuality by allowing for privacy, yet ensuring a feeling of openness, being cocooned within a bigger space. Designed to create a feeling of grandeur, the elevation treatment attempts to break away from the traditional notions of design. A façade that clearly reflects the triangular form inspired from the NID logo, coupled with the exterior of various zonal blocks that seamlessly integrates the columns, lends a sense of coherence and homogeneity to the overall design language.

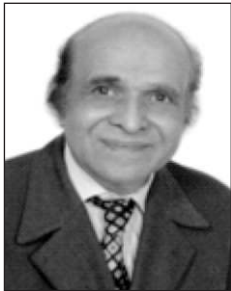
Conceived to be self-sustainable, National Institute of Design, Bhopal, has been carefully planned to account for future

expansion. Energy efficiency has been the core of the design process, aimed to reduce dependence on energy with passive solar techniques, attention to orientation and facilitating wind movement. From utilizing treated water from the STP to incorporating dual flushing systems, the entire campus has been carefully integrated with green building strategies to minimize operational costs, thereby achieving the standards of being certified with an IGBC Gold Rating.

Overall, the design of the NID institute aims to pursue the concept of a “building that educates”; it successfully embodies the principles of pedagogical integration and flexibility, while assimilating organic environmental variables along with the pre-existing elements of the landscape. Being an academic institution of national importance, National Institute of Design, Bhopal, truly reflects the spatial components present in the collective memory of the institution.



An Agenda for Inclusive, Sustainable and Affordable Housing



Ar. A.K. Jain - ak.jain6@gmail.com

A.K. Jain, worked as Commissioner (Planning), Delhi Development Authority and as a member of the Committee of the Ministry of Urban Development on the DDA (2015). He was as a member of UN Habitat (2007-12). A member of Editorial Board of International Journal of Environmental Studies (UK), and author of several books, he is visiting faculty in planning and architecture. He was awarded 2nd Urban Professional Award 2014 at World Urban Forum in Medellin, Colombia and IBC Lifetime Achievement Award (2016).

ABSTRACT: *The Pradhan Mantri Awas Yojana (PMAY) aims to provide housing to all by 15th August 2022 by building 12 million housing units and making Indian cities slum free. Under the PMAY (Urban) during 2014-19, the Ministry of Housing and Urban Affairs has approved the construction of about 79 lakh dwelling units, which is one of the largest housing programmes ever undertaken. However, these achievements need to be upscaled and shift towards a more inclusive sustainable and affordable housing.*

Shelter is a direct manifestation of poverty and lack of it is a major cause of poverty. In India, in 2014, there was a housing shortage of 18.78 million units, of which 96% pertains to Economically Weaker Section (EWS) and Low-Income Group (LIG).

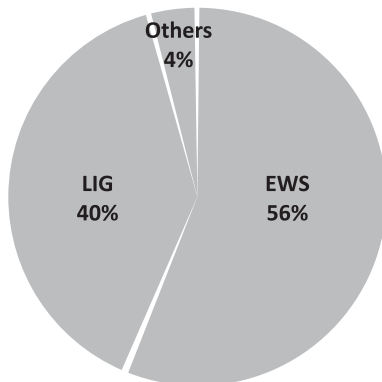


Fig. : 96% of housing shortage pertains to EWS and LIG.

Since Independence in 1947, various housing programmes have been undertaken by the government of India and the States, the latest being the Pradhan Mantri Awas Yojana (PMAY). This aims to provide housing to all by 15th August 2022. The mission seeks to build 12 million housing units and make Indian cities slum free. The mission defines an 'affordable housing project' as one where 35% of the houses are constructed for EWS category. Economically Weaker Section (EWS) households are defined as households having an annual income up to Rs. 300,000. An EWS house is a dwelling with a carpet area below 30 sqm with adequate basic infrastructure services like toilet, water, electricity, etc. Low Income Group (LIG) is defined as households having an annual income between Rs. 300,000 up to Rs. 600,000. An LIG house is a dwelling unit having a carpet area of 30 sqm to 60 sqm. Slum is defined as a compact area of at least 300 persons or



In Mumbai, about half a million people sleep on the streets and ten times as many live in crowded, dangerous slums and shanty towns

about 60-70 households of poorly built, congested tenements in unhygienic environment, usually with inadequate infrastructure, sanitary and drinking water facilities.

The program provides an interest subsidy of 6.5 per cent on housing loans with tenure of up to 15 years for EWS and LIG. This equates to nearly Rs. 100,000 to Rs. 230,000 per unit. It mandates ownership of a house in the name of women or joint ownership. The PMAY aims to make all 4041 Indian cities slum free. It requires the cities to prepare a Slum Free City Plan of Action (SFCPoA) for redevelopment of slums by leveraging the potential of land.

Under the PMAY (Urban) during 2014-19 the MOHUA approved the construction of about 79 lakh dwelling units, which is one of the largest housing programmes ever undertaken. Simultaneously, Global Housing Technology Challenge- India (GHTC) was launched to identify and mainstream construction technologies for affordable housing that are sustainable, green and disaster resilient. These aim to

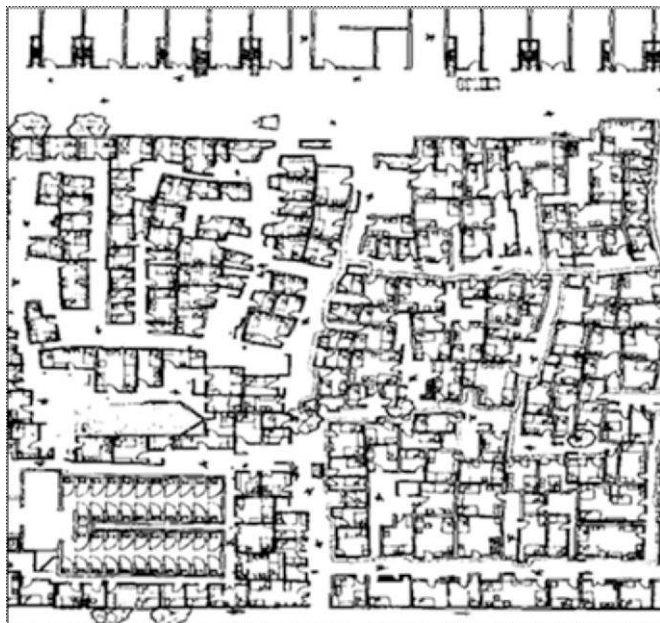
expedite the large-scale housing construction with efficient and economical use of resources and environment friendly practices. About 15 lakh houses are being constructed using new technologies.

Reviewing the Housing Policies

Inspite of many laudable housing programs and projects, the cities still witness a large number of homeless/poor living in inhuman conditions in slums, squatter settlements and illegal colonies, devoid of basic services like water, sanitation, toilets, sewerage, drainage and waste disposal. A survey of Delhi indicates the distribution of one-sixth population in each type of following areas :

1. Slum and jhuggi-jhompri clusters/basti
2. Unauthorised colonies
3. Old City /villages
4. Public Housing- site and services
5. Public Housing -built up units
6. Private Sector Housing.

The surveys indicate that most of the public housing schemes have not been able to cater to the homeless, squatters and slum dwellers. Out of a total housing shortage of 18.78 million dwelling units (MOHUA, 2015) 15 million (about 80 per cent) was due to dilapidation and congestion. As such, renewal and redevelopment of existing housing stock should be a major focus area.



Squatter clusters in New Delhi cater to the poorest, having average plot / dwelling size of 10 to 20 sqm, without any municipal services. Source : Patwari S, Bo Tang and Maurice Mitchell (eds.) (2010), Learning from Delhi-Dispersed initiatives in urban landscape, Ashgate, Surrey

Accordingly, the housing authorities have taken up various schemes for redensification, redevelopment and renewal of such areas, such as Bhandi Bazar in Mumbai and Kidwai Nagar in New Delhi (2018).



Kidwai Nagar Urban Renewal: Old, dilapidated housing areas with low-rise houses replaced by multi-storied housing releasing ground for roads, parks and common facilities.

These schemes manifest a departure from the earlier (1960s to 1990s) large scale evictions and resettlement schemes, whereby small house sites(18 to 25 sq. yd.) were given. This approach usually saved on cost of land, construction and laying of services. In Delhi 3.5 lakh households were resettled during 1960 to 1996.



Ambedkar Nagar, New Delhi Site and Services / Resettlement Scheme (1977). The initial horizontal approach has gradually transformed to high density walk-ups.



Site and Service Project in Arumbakam, Chennai Metropolitan Development Authority

In the Arambakkam site-and-services project, designed by Christopher Benninger and implemented by the Chennai Metropolitan Development Authority, every house is an expression of the lifestyle of its dwellers, shaping the house according to personal preference, but within an organised framework.

Renowned architect Charles Correa, in his Belapur Housing Scheme at Navi Mumbai, devised a system of social organisation. The organisation of the community revolves around a system of open space, which gradually builds up from a small courtyard of 8 x 8m size for seven dwellings, to 12 x 12 m for 21 families, 20 x 20m for 63 families and onwards. The simple house can be built by the local artisans and by self-help, which allow alterations and flexibility.



Fig. : Belapur Artists Community, (Architect Charles Correa)

The celebrated architect B V Doshi, in his Aranya Township at Indore, refined the concept of site-and-services. The concept is based upon maximization of scarce resources and stimulating the self-help element among the low-income families. To correspond with the economic growth of the families, the housing design adopts the principle of an incremental prototype. The most innovative aspect of the project is an alternative system of the services. The service core and slots have been predesigned, which connect with the main lines running on alternate streets. The space for the service core is so planned that it allows alterations and modifications in the house, if required, at a later date. A versatile system for sewerage has been evolved which is based on local services, without dependence upon the city systems. For maximizing the common walls and minimising the foundations, the service core is grouped into fours over suspended platforms. Simple on-site precast elements and components encourage the self-build spirit.

Low Cost Housing : The concept of low-cost housing is based upon the use of self-help, local materials, appropriate technology and building systems. The architects, like Laurie Baker, B.V. Doshi, Anil Lal and agencies like the HUDCO have

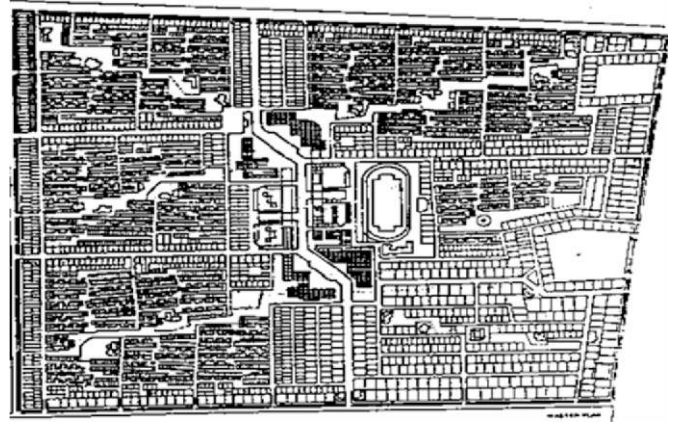


Fig.: Aranya Township, Indore (Architect B.V. Doshi)

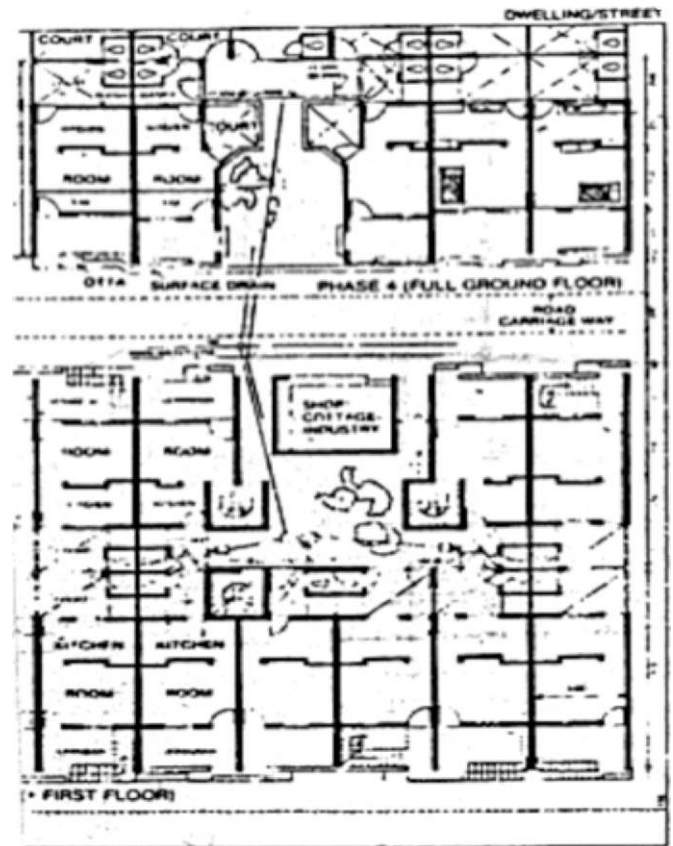


Fig. : Self-help housing at Aranya Township, Indore, which is built according to household's resources, needs and priorities

done commendable work in this field. Traditional methods and materials have been interrelated with sustainable, less expensive and innovative building systems. Such efforts have also resurrected the vaults, domes, arches and many such traditional elements of building.

Such houses are simple to build, honest with building materials, comfortable for the climate and economical. These are not the final and finished products, but facilitate growth and improvements along with the family's needs and resources.

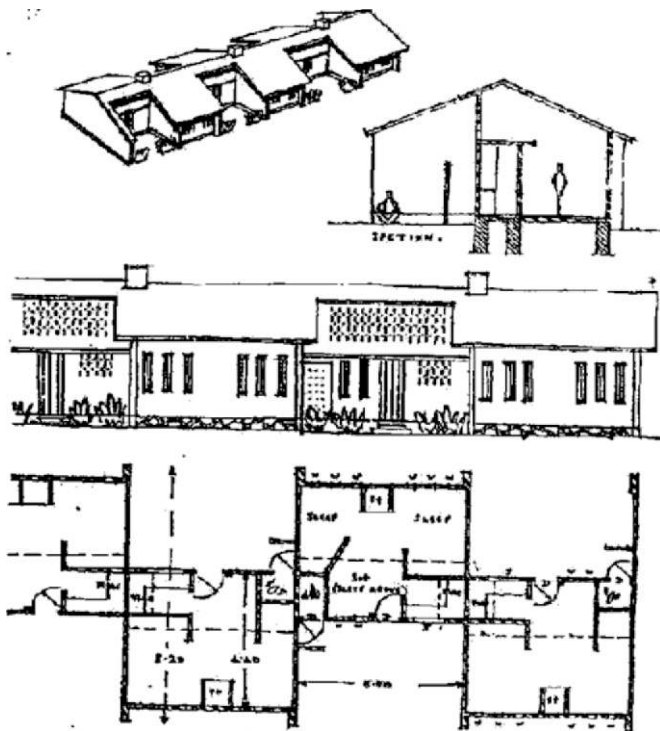


Fig. : Laurie Baker followed the principle of 'less is more' and 'small is beautiful' in the organization of space
 Source : Gautam Bhatia, 1991, Laurie Baker Life, Work and Writings, Viking, HUDCO, New Delhi

In Auroville, the Township Development Group have experimented with the reintroduction of village craft of building construction. These include earth platforms, mud walls, brick lintels, arches for openings and country tiles and thatch for roofing. Reinhold Pingle has also adapted such techniques in his 50-house cluster at Mahaveerapuram. In Wardha, from where most of the Gandhian thoughts and philosophy radiated, the Centre for Science for Villages and

Group of Research and Exchange on Technology has developed simple, low cost and pure concepts of housing. The housing incorporates mud-walls, vaults built by thin burnt clay bricks and mud mortar, Nubian arches, bamboo lintels and arches for openings, pozzolona plaster over woven bamboo mats for partition walls, simple reinforced concrete and prefabricated joists. The Nubian arch is based on the catenary curve in which only compression stress occurs. This does not require any centering and is insulated by a mud phuska layer.

The key to success of low-cost housing and slum rehabilitation is the adoption of local, participatory, rapid assessment, which allows the communities within a constituency to link together, survey their housing and livelihood problems, and then enter into a collaborative process with the municipal government and other concerned organisations/service agencies to jointly develop options and programmes which resolve their problems.

A GIS based inventory and total station survey of all potential lands for housing and slum redevelopment should be prepared. After identification of potential sites, it is necessary to assign suitable land use for such sites and provide proper services and linkages. The plans of housing renewal and resettlement should be based on the assessment of ground realities, existing land use, land ownership, land values, socio-economic characteristics and physical conditions of the settlement. Based on the inventory, the community can access the land and funds for the infrastructure development and the construction of dwelling units. The criteria for selection of specific strategy of relocation or in-situ upgradation have to be based on certain indicators, which is differentiated according to type of slum, habitation and its population. The following table indicates various types of shelter and possible approaches :

Table : Shelter Types and Possible Approach

S. No	Type	Approach
1.	Rundown walk ups in core areas	Co-operatising: Reconstructing at site with municipal support with transit accommodation provided during construction with ownership of constructed units through soft loans/subsidised rentals.
2.	Pavement/doorstep dwellers, squatters in core areas (generally new entrants to the city as individuals).	Sanitation through night shelters, pay and use toilets, health facilities; when households formed, a few could be rehabilitated in Site and Services Schemes; otherwise they move as renters in spontaneous colonies in core areas.
3.	Spontaneous slum clusters in core and intermediate areas in marginal lands - single/double storeyed construction	Granting tenural rights and sanitation of environments (paving, street lighting, drainage, individual ablution facilities, potable water) or gradual reconstruction/ upgrading.
4.	Spontaneous colonies in peri-urban areas (generally new migrants), Single storeyed improvised shelter.	Sanitation and granting tenural rights over a period of time.
5.	Site and service schemes serviced, plots with wet core sometimes with a roof	Reduced planning and evolutionary space standards
6.	Built units in 4 to 5 storeyed walk-ups in peri-urban areas or 8-16 storeyed blocks in central areas on subsidized rentals.	Regular public housing

Source : E.F.N. Ribeiro / AMDA (2000).

Kathputli In-situ Slum Rehabilitation Project

The Kathputli Colony in the West Delhi is inhabited by the puppeteers, street artists, snake charmers and magicians. The area is located near Shadipur and had come up on public land in 1950s, when the wandering artists settled at the vacant land near railway tracks, which was then on the western fringe of the city. The Kathputli Project covers 5.22 hectares and is planned to provide 3,000 to 4,000 EWS (Economically Weaker Section) flats for squatter families. According to the plan the community of puppeteers and performers who stay herewill be temporarily shifted to transit camps till the private developer constructs multi-storey flats to accommodate the estimated 3,200 families. Planned under the public-private partnership with Raheja Developers, the project was first announced in 2009 but was delayed due to many hurdles. Part of the land would be used by the private developer to build residential and commercial pockets that it can sell at market rates. With an area of 36 square meters, the flats would be located in six 15 storey towers. Each household will be given a Permanent Unique Number to ensure transparency.

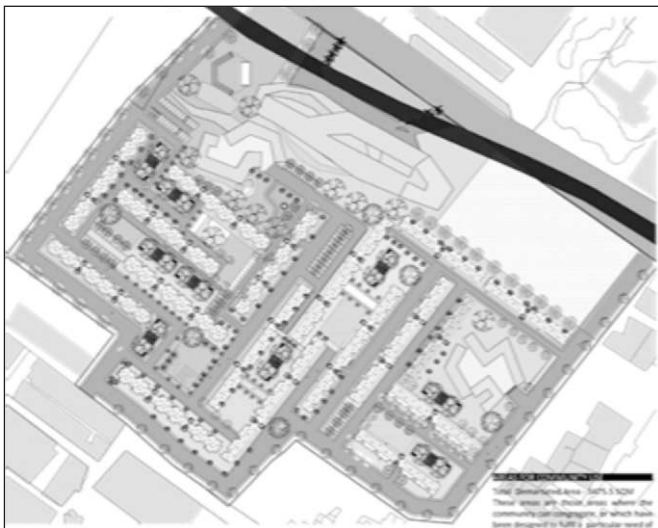


Fig. : Kathputli In-situ Slum Rehabilitation Project, New Delhi

Slum Rehabilitation Scheme (SRS) in Mumbai

The Government of Maharashtra's Slum Rehabilitation Scheme is based on "Public Private Partnership" (PPP), which aims to address the primary issue of right of slum dwellers to decent housing, tenure rights and means of livelihood. On-site rehabilitation gives the slum dwellers access to basic civic amenities, besides promoting neighbourhood improvement. The slum dwellers are also required to provide maintenance charges, which is collected upfront. The slum dwellers are extended with other benefits, such as reduced Stamp Duty, Property Tax and Water User Charges. The Slum Rehabilitation Scheme of the Government of Maharashtra provides leasehold rights at a highly subsidised rate.

Resettlement of Slums under Mumbai Urban Transport Project

Mumbai is home to some 20 million people, of which 7 million live in 3,000 slums, built on public lands, roads, airports, stations, markets, etc. In 2002, the MHADA embarked the Mumbai Urban Transport Project (MUTP) with the help of the World Bank which aims to improve the transport services in the city. The project required large scale resettlement of slums, commercial establishments, public facilities, as well as cultural and religious structures. These included about 100,000 people or 17,500 households, some 1800 shops, more than 100 religious and cultural properties, which existed on railway lands, public and private lands and roads. There was a variety of such occupiers-legal landowners in multi storey buildings, 'pagdi' holders, tenants and lessees, as well as squatters without title. Almost ninety-five of these not have legal title. The project required relocation of utilities, including underground water and electricity pipelines, telephone cables, drains, and few large transmission towers. Resettling of 100,000 people required finding several resettlement sites in Mumbai and mobilising huge financial resources to build free housing of 225sq.ft. each. Affected shopkeepers and land owners were also allowed to buy additional floor area up to 525 sq.ft. in proportion to their loss.



Slum Resettlement Under Mumbai Urban Transport Project with 225 sqft Dwelling Units

Source : World Bank

Land as a Resource

The incentives like allotment of government land for social housing, additional FAR, development rights, commercial component, etc. can making social housing schemes bankable. One such project is the Shukhobrishti housing developed in an area covering 60 ha at Rajarahat, approximately 25 kilometre from Central Kolkata. The housing project consists of 20,000 flats for 100,000 population with 12,000 lower income group flats in G+4 walk-up structures and 8,000 MIG flats in G+14 multi-story structure. The project was awarded to the developer Saporji Pallonji by Kolkata Metropolitan Development Authority (KMDA). The initial

selling price for LIG (30 sqm, 1 BHK) was Rs. 4 lakh and 8 lakh for 44.5 sqm (2 BHK) MIG apartment. The developer was awarded 20ha land by the government to develop commercial use in return to the residential development. A density of 300 dwelling units per ha was achieved. There had been no restriction on height. Homes are sold nearly half of the market price on a freehold basis without any restrictive covenants on the titles. As a result, homes are now available in secondary market at approximately double the original price.



Shukhobrishti at Rajarhat New Town, Kolkata, developed by Shapoorji Pallonji in association with the KMDA and West Bengal Housing Infrastructure Development Corporation (WBHIDCO). The project covers 150 acres of land in Rajarhat and has 20,000 dwelling units: 10,444 (LIG) apartment with carpet area of 320 sq.ft., 3840 MIG apartments of 480 sq.ft. and balance 5716 apartments, each having an area of 690 sq.ft.

Inclusive and Adequate Housing

According to UN Habitat (Habitat III Issues Paper, 2015) adequate housing must provide more than four walls and a roof. A number of conditions must be met before particular forms of shelter can be considered to constitute “adequate housing.” These elements are:

- Security of tenure : housing is not adequate if its occupants do not have a degree of tenure security which guarantees legal protection against forced evictions, harassment and other threats.
- Availability of services, materials, facilities and infrastructure : housing is not adequate if its occupants do not have safe drinking water, adequate sanitation, energy for cooking, heating, lighting, food storage or refuse disposal.
- Affordability : housing is not adequate if its cost threatens or compromises the occupants' enjoyment of other human rights.
- Habitability : housing is not adequate if it does not guarantee physical safety or provide adequate space, as well as protection against the cold, damp, heat, rain, wind, other threats to health and structural hazards.

- Accessibility : housing is not adequate if the specific needs of disadvantaged and marginalized groups are not taken into account.
- Location : housing is not adequate if it is cut off from employment opportunities, health-care services, schools, childcare centres and other social facilities, or if located in polluted or dangerous areas.
- Cultural adequacy : housing is not adequate if it does not respect and take into account the expression of cultural identity.

Many migrants, labourers, casual workers, beggars, etc. in the city do not have shelter and live on pavements near their jobs. For them a regular dwelling unit on the ownership basis is unthinkable. Thus, the definition of shelter may include rental units, dormitories, hostels dharmshalas, lodge, transit camps and night shelters. As a human right, the city should provide housing to all, without leaving behind the informal, marginalised, homeless, migrant workers, students and elderly. These should be located near the Railway Stations, Bus Terminals, major markets and work centres. The housing policy should aim at providing inclusive and adequate shelter.

Each housing and slum re-development plan should address specific local issues and provide flexible choices of in-situ upgrading, relocation, land sharing or re-blocking. The local area plan should network all the settlements, where the local stakeholders plan together. Uniform standards that are set too high can price poor households out of formal housing. It may be better to provide basic shelter in appropriate locations, even with limited space as dormitories, hostels, etc. The existing housing stock may serve residents where they have social connections and access to employment.

The critical concerns in redevelopment of housing are water supply and power, which are under severe stress. These require strategic interventions as follows:

- i. Preparation of services plans
- ii. Mandatory adoption of wastewater recycling and renewable energy, water conservation and energy efficiency as per ECBC (Energy Conservation Building Code)
- iii. Checking of leakages, thefts and transmission losses which can save about 15 to 20% of water and power
- iv. Enhancing organisational efficiency

Rental Housing

The large number of low-income families cannot access housing loan and are unable to pay its upfront cost and mortgage payment. Many poor families survive on day to day earnings and can only afford rental housing. Even in illegal slums and invasion on public lands, they pay weekly or monthly rental to slum lord. However, the quantum of rental housing is diminishing due to various reasons such as taxation, Rent Control Act, paperwork and transactions involved. The rental housing as per NSSO/Census (2011) is only 10 per cent

by a formal rental arrangement and 17 per cent households, mostly poor, live in informal rental housing. Keeping in view the difficulties in obtaining rental payment, the concessions, loans and legal disputes, even the available housing is kept vacant or sold away. Most of the house owners fear that once the house is given on rent, it will never be available to the owner. As such, it is necessary to lay thrust on rental housing review the rental legislation, the tenure system and adopt rental housing strategies

In this context, the Government of India has formulated Draft National Urban Rental Housing Policy (NURHP, 2015) which suggests various policies, administrative and legal measures, and financial incentives to promote rental housing. The following can be the key triggers for rental housing:

- Rental Housing Policy needs to be more closely integrated with the Pradhan Mantri Awas Yojana, which focuses on the EWS/LIG, informal sector, workers, women and aged.
- The provision of one-third to one-half number of dwelling units have to be rental. The developer and corporations should be incentivised to build rental which can be managed by non-profit associations or RWAs.
- Bonus FSI, as done by MMRDA, can incentivize the development of rental housing
- Models such as Rental Housing Vouchers given to homeless, destitute, aged, women, etc. and Low-Income Housing Tax Credit (LIHTC) of the US, which gives rebate in income tax against investment in low income rental housing can have multiplier effects.

Community Development

Housing for the poor supports their livelihood. It thus helps to empower them, and with them the whole nation. Housing acts as a vehicle for poverty reduction, social empowerment, community interaction, and access to health, educational and recreational facilities. Thus, housing enriches the society and provides a better quality of life and environment. Besides defining a minimum house (say 30 sqm dwelling unit or 10 sqm per capita), a housing cluster should provide a minimum space of about 5 sqm per capita each of green area/open space/play area, social infrastructure and transport and utilities. These can integrate housing with health, livelihood, natural resources, climate and culture. Participatory planning is necessary to achieve the housing goals, establish the requirement of the resources and to accomplish the plans. No plan, however good, can be implemented unless it is supported by the people and stakeholders at all levels of decision making and implementation.

The organization of urban space into the 'communities' is a key to a cross-sectoral spatial coalition of social, economic and environmental systems that focuses on the following:

- Infrastructure improvement : roads, drains, water, sanitation, street lighting and community halls;

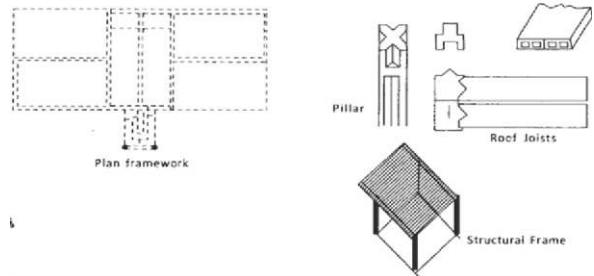
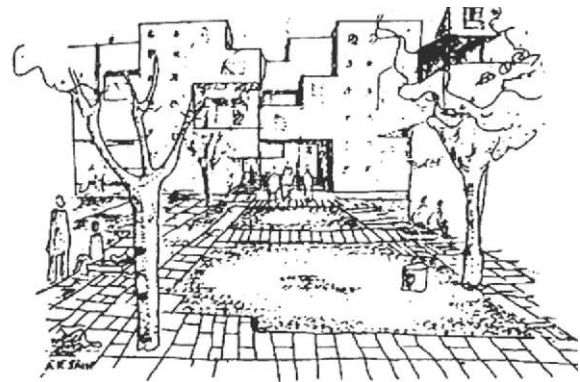


Fig. : Skeleton housing provides platforms with a wet core for expandable houses (A.K. Jain)

- Health : promotional and preventive via maternal and child health clinics, mohalla clinic, health awareness and facilities;
- Education : pre-schools, non-formal education and literacy;
- Facilitating community based participatory planning;
- Community development : institution building, gender awareness, vocational training and economic support;
- Encouraging small home-based occupations,
- Promoting micro-credit facilities; and
- Networking among slum communities.

Housing development can drive economic growth and improve the quality of life of people by better services, governance and urban mobility. This would be possible by the preparation of Service Level Improvement Plan (SLIP), Action Plan and DPRs which focus upon water supply, sewerage, septage, storm water drains, urban transport, green areas and parks and other social amenities.

The Third Option

Generally, the approach of the governments towards low cost housing is supply driven with private sector partnerships. This may endanger the access of housing to the low-income group and could be bought over by the investors/ speculators. As a result, a large number of new dwelling units built by private developers and in PPP remain unoccupied. The Census 2011 pointed out the paradox that as many as 11.09 million houses are lying vacant, on the face of the total housing shortage of 11 to 12 million dwelling units.

This poses a need to re-examine the supply driven approach towards housing, which is often without the participation of the dwellers. The public-private model is largely focused on greenfield development and marginalises the poor.

This makes us to rethink about a new paradigm, which is gender sensitive, community led, participatory and local. This can be termed as the third option. This option does not exclude private sectors but energise the collective community sector.



Fig. : Collective Community Sector as Third Option to Public-Private Binary

Development Controls and Zoning Regulations

Some have argued that to solve the housing shortage, it is necessary to liberalise the Floor Area Ratio (FAR) and have higher densities. There is no doubt that it is essential to optimise land use by rationalizing the FAR and residential density. It does not follow, however, that higher FAR can help to create more social housing. Sometimes an increased FAR has led to creation of vacant, speculative housing with no relation to the social needs and poverty. The Floor Area Ratio has to be seen in combination with plot coverage, density, housing form and the local urban context which could accomplish a dynamic urban environment. FAR, land use and densities involve a balance and trade-off between open and built-up spaces, land and infrastructure development. It is necessary to reserve a proportionate amount of land for transport corridors, social facilities, social housing and public green spaces against the grant of FAR/FSI and land use conversion.

By grant of the incentive Floor Area Ratio, Accommodation Reservation and Transferable Development Right Certificate, the private owners and developers can be made to provide part of their land/ built-up area for public greens and facilities. While deciding the FAR a balance has to be struck between the cost of land per unit and construction cost. While higher

density and FAR, may reduce the cost of land, the cost of construction increases steeply beyond walk ups (15 m height).

Various types of housing forms, including slum clusters, chawls, traditional/inner city, urban villages, unauthorized colonies, site and services, public sector built-up apartments, private sector housing, cooperative housing, etc. can be evaluated for their access to the poor. In this context, the unplanned developments appear to be affordable as compares to the planned developments. This means incorporating the positive aspects of unplanned developments, such as chawls in Mumbai, which are walk-ups, compact, high density and affordable.

Sustainable Housing Design

Site Planning and zoning regulations play a major role in mainstreaming sustainability in following ways :

- Maximising greens, trees, vegetation and public areas
- Minimising roads, service lines (water, sewer, electricity, drainage, etc.), parking and paved area
- Minimising envelope surface area by compact, dense urban form
- Reducing cost of land and land development by optimizing densities and FAR
- Reducing energy consumption and construction cost
- Optimum densities, mix land use, compact and dense form
- Reduce building footprint and maximise greens, play areas, patios, green roofs and public areas

In hot climate the objective of site planning and building form is to minimize solar gain and to reduce the need of cooling, thus reducing the demand for energy. As such to reduce surface area for heat transfer, it is necessary to avoid elongated thin forms and spread out low-rise housing. Compact and dense forms are preferred with multiple use/mixed uses. Landscaping can enhance the ecology and aesthetics and cool the buildings. Apart from ground planting, vertical landscaping, patios and roofs can be landscaped.

The dwelling units can be built on a self-build model or evolutionary design with 'built up floor, roof and service core'. This approach recognizes the right of each family to develop its own dwelling according to its own priorities, needs, resources and changes. Evolutionary design defines the house-core relationship, i.e. the design of a built core, its location and the development alternatives for its growth.

Optimizing housing development and reducing construction cost

It is necessary to optimize the housing development and construction to achieve quality, productivity and flexibility, together with reducing time and costs. There is a need to innovate in construction, efficiency, quality of service and sustained maintenance. This applies to standards and specifications, infrastructure, construction, maintenance,

together with energy and environment concerns. According to McKinsey Global Institute, the critical housing cost reduction strategies at design and construction stage include the following :

- Pre-manufacturing : build components off-site using industrial processes, deliver parts as needed.
- Planning Optimization : apply critical path management techniques to optimize plan implementation by realistic scheduling.
- In-site lean execution : use lean techniques to standardize procedures that eliminate waste in individual activities and improve construction flow balancing.
- Process Step Productivity: eliminate low value added activities and wasted time to optimize process efficiency.
- De-specification of structural design: Avoid over-specification of non-value-added components.
- Standardization of micro-design: Identify substitutes and use design-to-cost to set specifications.
- Determine sourcing strategy for each category of construction activity, detail sub-contractor management
- Housing Optimization by volume increase through bundling, labour saving production, low-cost sourcing, and capacity optimisation of housing agencies, including the public, private and community sectors
- Technical Optimization: Standardize and identify substitutes with advanced costing tools.

Automated procedures can give precision to building construction and components and enable accuracy. Computer-Aided Manufacturing (CAM) and Computer Integrated Manufacturing (CIM) for prefabricated components, viz. ceilings, walls, roofs, etc. are integral to the process of industrialized construction. The simulation of construction process enables better control of time, machine, expenditure and the manpower, which could be reduced at least by half to one-third in comparison to the conventional construction. It is necessary to adopt industrialized building systems for efficient and economical housing delivery.

Digital Land Records and Property Transactions

In order to streamline the land market and regulate the transactions, as well as to discourage encroachments on public lands, it is necessary to make property registration, mutation and transfer simple, transparent and quick. To bring in accountability in the real estate sector, rating of developers and projects and licensing of real estate agents / brokers / realtors need to be implemented, as mandated in the Real Estate Regulation Act, 2016. To deal with the problem of land titles, it is necessary to introduce the Torrens System of property title registration. This will curb litigation on the question of ownership and rights to land. It is also necessary to expedite procedures for project approval.

Tenure Rights

The grant of ownership tenure in illegal settlements, slums and unauthorised colonies is essential to trigger a process of transforming the informal settlements as formal, improve the environment and mobilise the communities towards a process of self-triggered and participatory redevelopment.

The ownership rights may be granted for a cluster comprising about 2000 sm, as to allow its voluntary regularisation and redevelopment into group housing with enhanced FAR, density, mixed land use, and one third of area under greens (with underground parking and services). This is how Singapore, which used to be a dirty, fragmented and fractured city 30 years ago, has been transformed into a world class city. Similar strategy has been adopted in various other cities all over the world allowing the amalgamation and consolidation of smaller plots for their composite redevelopment.

Conclusions

Housing is a complex and cross-disciplinary area of spatial, social, economic and environmental development. It is closely related with the livelihoods, jobs and poverty alleviation. In spite of laudable achievements, there is a need for review of housing policies and strategies which enable the provision of inclusive and adequate housing. The unplanned city is an indispensable part of urban process, which needs to be upgraded with basic infrastructure services. In view of making housing affordable, it is necessary to optimise the development controls and construction which converge into making the shelter as a source of livelihood, sustainability and a more equitable social order.

REFERENCES :

- *Census of India (2011) Census Report, Government of India, New Delhi*
- *Dupont, V. (2008) Slum Demolition in Delhi Since the 1990s : An Appraisal, Economic and Political Weekly, Vol. 43, 28, (2008), p. 79-8*
- *Gautam Bhatia (1991) Laurie Baker- Life, Work and Writings, Viking, HUDCO, New*
- *Jain A.K. (2016) Building Twenty Million Homes, Discovery Publishing House, New Delhi*
- *Jain A.K. (2020) Tall Buildings and Vertical Urbanism, Discovery Publishing House, New Delhi*
- *Jain, A K. (2020) Housing and Community Planning, Discovery Publishing House, New Delhi.*
- *McKinsey Global Institute (2014) A Blueprint for addressing the global affordable housing challenge, New York.*
- *Ministry of Housing and Urban Affairs (2015) Pradhan Mantri Awaas Yojana (Mission on Housing for All Guidelines, Government of India, New Delhi.*
- *MOHUPA (2012) Task Force Report on Housing, Government of India, New Delhi*
- *Patwari S, Bo Tang and Maurice Mitchell (eds.) (2010), Learning from Delhi-Dispersed initiatives in urban landscape, Ashgate, Surrey*
- *Ribeiro EFN (2000) Shelter Types and Possible Approaches, Association for Municipal and Development Authorities (AMDA), New Delhi*
- *UN Habitat (2003) The Challenge of Slums - Global Report on Human Settlements, London,*
- *UN Habitat (2015)Habitat III Issues Paper, Nairobi*

Forest-Invasions : Restoration of Forest Ecosystems Affected By Invasive Plant Species Lantana in Corbett Tiger Reserve of India

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ABSTRACT :

Lantana is one of the worst weeds of South American origin that has threatened native biodiversity of forest ecosystems across India. It was introduced into India as a garden ornamental plant in the 19th century and now it has spread over all the tropical and subtropical regions of India. Various attempts have been made by forest department of India to control Lantana by physical, chemical and biological methods; but there is no success in its control and the prevention of its spread. No effective management strategy was available to limit and stop the spread of this alien weed. The assessment of the biological and ecological systems of Lantana is studied by the team and has developed a new management strategy. The new strategy developed has been implemented successfully in plots of 2–5 hectares at the Corbett Tiger Reserve (Uttarakhand).

KEY WORDS : Invasions, Ecological Restoration, Lantana (*Lantana camara*), Cut rootstock method, Corbett Tiger Reserve .

Introduction

Invasive non-native plants can contribute directly to the degradation of ecosystems or they have indirectly affected the global climate and thus posing a threat to the survival of living beings. Ecological restoration is the application of ecological principles to return the ecosystem of native trees in Corbett tiger reserve and the tiger habitat.

1. **Ecological Restoration Approaches In Corbett Tiger Reserve :** Removing weeds or reinstating a natural disturbance in the tiger reserve was a must needed.



Fig. 1 : Typical Lantana Camara Species.
Source: Google

The forest department team has studied the practice of restoring degraded ecological systems affected by invasions. Enhancement of various ecosystem services and re-establishment of ecological integrity which was their motto, further by bringing back the native species, the deliberate removal of invasive alien species Lantana. The ecological restoration thus aims to recover its structure i.e. species composition, soil and water properties and functional properties i.e. productivity, energy flow, nutrient cycling. Allow natural recovery and recover the ecological service system in the tiger reserve.

Lantana has many adverse effects on forest ecosystems which include (i) loss of native biodiversity (ii) replacing native plant communities in forest ecosystems by forming dense impenetrable thickets, (iii) contributing to erosion of soil, (iv) adversely impacting the regeneration of forests, (v) harboring vectors that carry infectious diseases and (vi) promoting fire hazard.

- Study Weed Composition
- Access Energy Flow And Nutrient Cycling
- Inspect Properties Of Degraded Soil And Water

Fig. 2 : Restoration Approaches For Corbett Tiger Reserve.
Source : Author

**FOREST-INVASIONS : RESTORATION OF FOREST ECOSYSTEMS AFFECTED BY
INVASIVE PLANT SPECIES LANTANA IN CORBETT TIGER RESERVE OF INDIA**

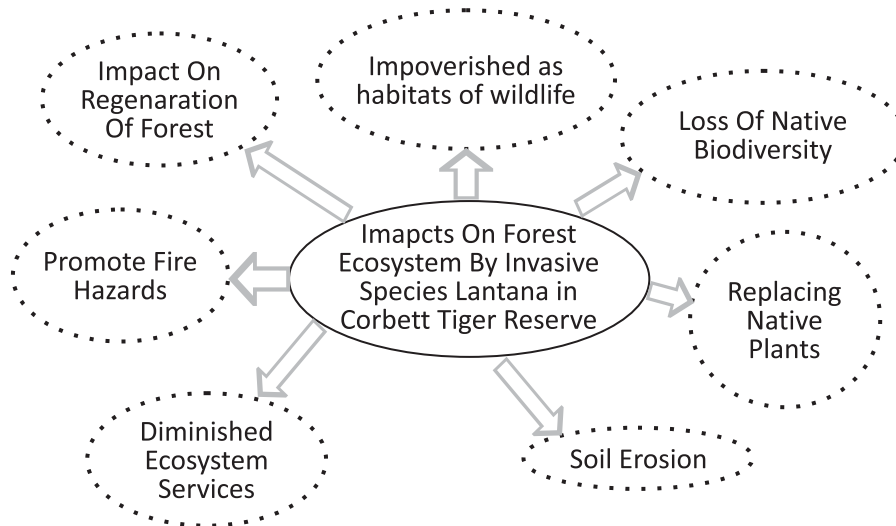


Fig. 3 : Factors Influencing the Degradation of Forest Systems in Corbett Tiger Reserve, India SOURCE: Author

2. Conceptual Scheme Analysis by forest department :

Propagule flow of invading Lantana is indicated in black balls. The size of upper three arrows indicates the intensity of control efforts required to stem propagule flow of Lantana. The shading intensity of restoration arrows indicates the intensity of effort required to ameliorate stressors or reverse changes in ecosystem processes that affect underlying conditions of plant growth in the forest of Corbett tiger reserve.

3. Traditional Methods Used For Control of Lantana In Corbett Tiger Reserve :

Mechanical/manual, chemical and biological methods have been used in the control of Lantana. The chemical and biological methods of control are not favored because of environmental and ecological reasons, particularly due to their potential adverse effects on other biota present in forest ecosystems, and hence not practiced by the managers of protected areas in India. Burning of Lantana clumps coupled with the use of herbicides or mechanical removal of Lantana has been

used for control of large-scale infestations of Lantana. The most common methods used in Corbett Tiger Reserve, India for the control of Lantana in forests are: (i) hand pulling, (ii) slashing/chopping of the stems, (iii) burning and (iv) manual grubbing with substantial removal of the root system. These methods have had no or little effect in controlling the spread of Lantana infestation, due to their inherent limitations and absence of an integrated control strategy. Table 1 gives limitations of different control methods used for Lantana infestation in forest ecosystems, particularly in protected areas. Some of these methods such as slashing/chopping and burning of Lantana clumps have actually led to the further worsening of the infestation; and in some areas, burning of the weed has promoted its spread to new areas. In other words, management of Lantana has become a vicious circle in which the control activity and reappearance and the spread of new infestation of Lantana are inextricably linked though inadvertently.

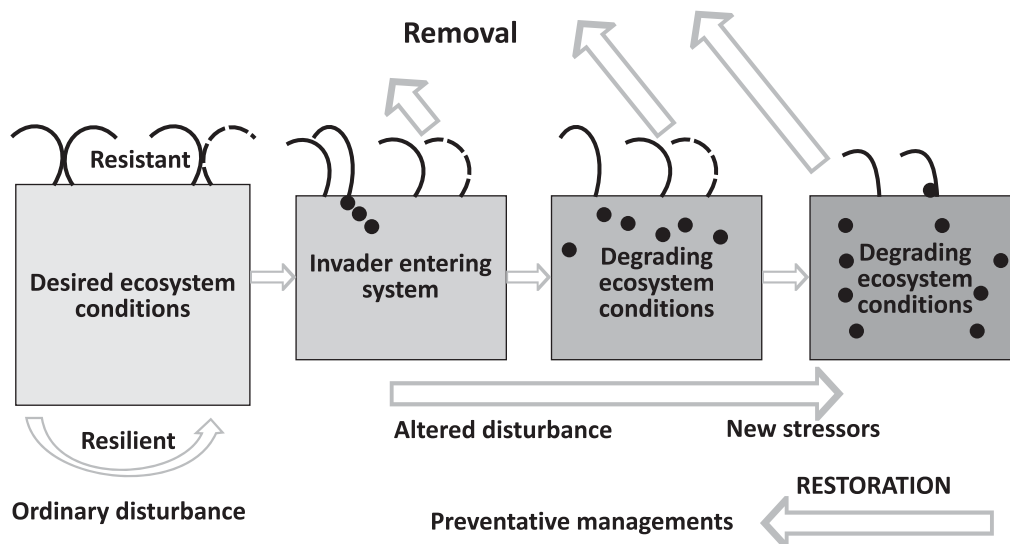


Fig. 4. : Conceptual Scheme Analysis by forest depart For Restoration of Systems Affected By Invasive Plant Species in Corbett Tiger Reserve. Source: restore ecosystems affected by invasive plant species by Carla M.D'Antino and Jeanne C.Chambers

FOREST-INVASIONS : RESTORATION OF FOREST ECOSYSTEMS AFFECTED BY INVASIVE PLANT SPECIES LANTANA IN CORBETT TIGER RESERVE OF INDIA



Fig. 5 : Traditional Methods practiced for the control of Lantana in forest ecosystem development team in India and their limitations
Source : Author

4. Biology Of The Invasive Weeds Lantana Camara

- a) **Description Of Lantana :** Lantana camara is a heavily branched shrub that can grow in compact clumps, dense thickets or as a climbing vine. The stems are square in cross section, with small, recurved prickles. Most leaves are about 6 cm long and are covered in fine hairs. They are bright green above, paler beneath and have round-toothed edges. Leaves grow opposite one another along the stem. When crushed the leaves produce a distinctive odour. Flowers appear throughout most of the year in clustered, compact heads about 2.5 cm in diameter. Flower colours vary from pale cream to yellow, white, pink, orange and red. Lantana produces round, berry-like fruit that turn from glossy green to purplish-black when ripe.
- b) **Life Cycle Of Lantana :** Flowering and germination occurs all year round but peaks after summer rains.

Several thousand seeds can be produced per square meter and these can remain viable for several years. They also produce some viable pollen and have the potential to cross-pollinate with wild forms, creating new varieties that could naturalize in the environment. If the numbers of naturalized varieties increase due to genetic drift from ornamental varieties, it will make finding effective biological control agents even more difficult and potentially extend the climatic tolerances and range of the weed's spread.

- c) **Methods Of Spread Of Lantana :** Spread mostly through the garden ornamental trade, by fruit eating birds and mammals. Lantana camara can also spread via a process known as layering, where horizontal stems take root when they are in contact with moist soil. It will also reshoot from the base of vertical stems.

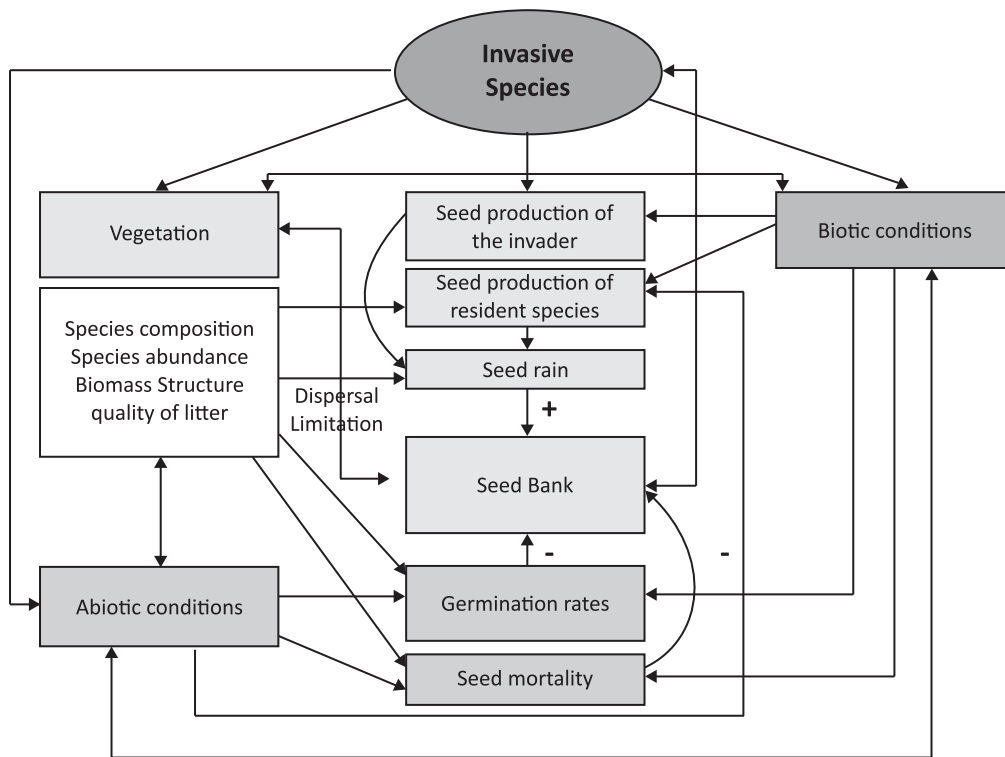


Fig. 6 : The introduction of invasive alien plant species may affect the soil seed bank directly, via the production of viable seeds; indirectly, via changes in the aboveground vegetation; in other biotic conditions, including the abundance and identity of natural enemies and pollinators; and in abiotic conditions Source: Gioria et al. 2012

d) Ecological Linkages Between Aboveground And Belowground Biota :

All terrestrial ecosystems consists of aboveground and below ground components that interact to influence community and ecosystem-level process and properties. Plants (producers) provide both the organic carbon required for the functioning of decomposers subsystem and the resources for obligate root-associated organisms such as root herbivores, pathogens, and symbiotic mutualists. The decomposer subsystem turns breakdown dead plant material and indirectly regulates plant growth and community composition by determining the supply of available soil nutrients. Root-associated organisms and their consumers influence plants directly and also influence the quality, direction and flow of energy and nutrients between plants and decomposers.

5. New Management Strategy For The Removal Of Lantana And Restoration Of Corbett Tiger Reserve In India developed by the restoration team of forest department : Substantial work has been carried out on the taxonomy, biology, ecology and management of Lantana. An effective and practical management strategy for the control of Lantana involves addressing issues of (i) invasiveness of Lantana, (ii) invasibility of habitats and (iii) ineffectiveness of the control methods used. Under the Centre of Excellence Programmed of the Ministry of

Environment and Forests, Government of India, field biological studies on Lantana were carried out for eradication of Lantana in forest ecosystems. The objectives of the new strategy are: (i) control of Lantana infestation in already invaded areas and (ii) to contain the spread of Lantana to new areas.

Component 1 : Conceptual And Implementation Planning :

Sites for removal of Lantana are identified through field surveys ,using the data collected on infestation and density of Lantana. The Lantana removal operation should follow the 'inside-out' method wherein Lantana is removed first from areas with maximum Lantana density and then moving outwards along a decreasing Lantana density gradient. In areas having undulating terrain and hilly tracts Lantana removal operation should be taken up on the slopes first and then downwards to the valley. Planning for the Lantana removal operation should also include the time of removal; the removal operation should be done preferably at a time when a majority of the Lantana clumps are not in flowering or fruiting stage. It may be noted that after removal of Lantana from a site, ecological restoration of weed-free landscape is critical for the control of Lantana. The ecological restoration plan should include the identification of source for selected plant species to be used in restoration, mode of collection of their propagules, development of nurseries for their mass propagation and their subsequent introduction at the site to be restored.

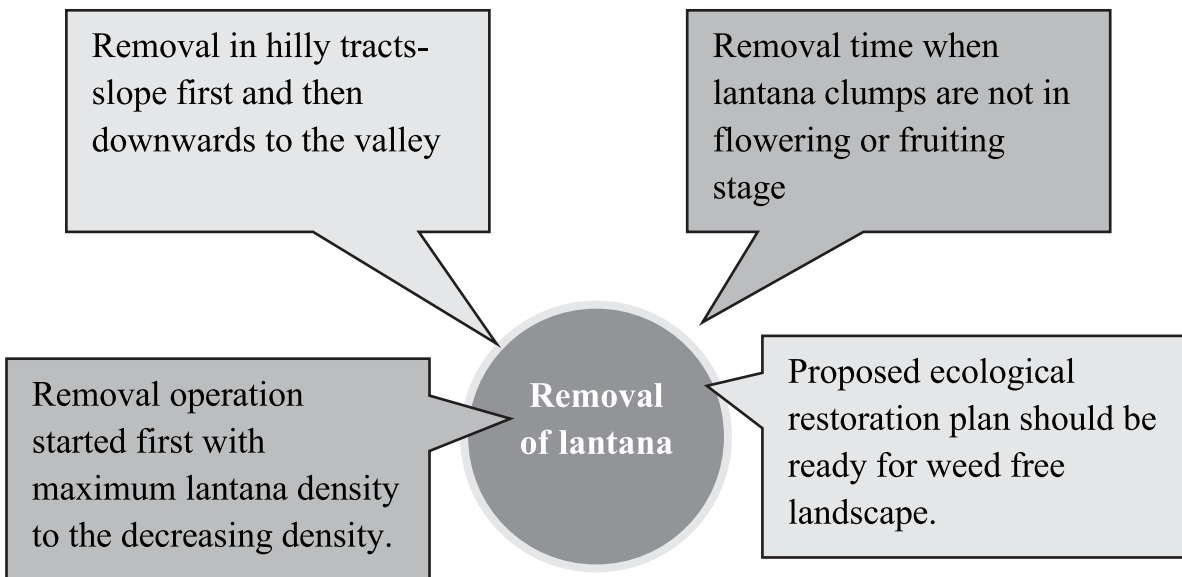


Fig. 7 : Conceptual and Implementation planning for removal of Lantana in Corbett tiger reserve.
Source : Author

Component 2 : Removal of adult clumps using cut rootstock method :

One of the innovations in the new management strategy is the development of a simple and cost-effective manual. Method for the removal of Lantana, known as cut rootstock method. As the name suggests, it involves cutting the main tap root of Lantana plant beneath the 'copping zone' (transition zone between stem base and rootstock) (Figure b). This method of removal involves the engagement of 2–3 individuals to work in a group for the removal of Lantana if the clump is large enough that it cannot be handled by one individual after the rootstock is cut. The steps involved in the cut rootstock method are: Figure.9 (i) The person, who engages in removal of Lantana, is positioned in a way that he stands near centre of the Lantana clump with his back facing the clump and holding the handle of digger (kudal) (Figure c). (ii) Using the specially designed digger, the person cuts the main rootstock of Lantana 3–5 cm below the soil surface by the main rootstock of Lantana 3–5 cm below the soil surface by hitting the rootstock 3 or 4 times (Figure d); (ii) Using the specially designed digger, the person cuts the main rootstock of Lantana 3–5 cm below the soil surface by hitting the rootstock 3 or 4 times (Figure d); while hitting the rootstock the blade of the digger gets lodged into the main tap root, and at this point it is useful to move the handle of the digger in the forward direction away from the body of the person so as to sever the connection of the clump with the main tap root (Figure e). In case the clumps of Lantana form impenetrable thickets, it is advantageous to cut the rootstocks of 3–4 contiguous clumps to make the removal operation convenient. The branches of Lantana thicket formed by more than one clump should be lifted and tipped over from one end by using a wooden or bamboo pole of about 1.5–2.5 m long and diameter 5–6 cm which is inserted just below the branches from one side and rolled over easily by

two workers holding the pole at either end and pressing it so as to reach the centre of the clump (Figure 2 a and b). Such manual handling of impenetrable thicket is possible because of the umbrella type of canopy which makes it difficult to reach the centre of clump easily. Such physical maneuvers minimize or prevent regeneration from rooted cut branches when they fall on the ground. (iii) Lift the clump/s and place the clump/s upside down (Figure 2 f and g). If the clump is not placed upside down, the prostrate rooted branches and the aerial old branches having aerial roots at nodes may develop into adult plants when they come in contact with the soil. Therefore, the upside – down orientation of cut clumps is critical in the prevention of regeneration of Lantana from cut clumps. (iv) After drying the clumps, the clumps may be used as fuel or burnt at the same site or all the dried clumps may be collected at one place and then burnt.



Fig. 8 a. : Uprooted Lantana Plant Showing Coppicing Zone At The Transition Between Stem Base And Root.
Fig. 8 b. : Lantana Removed By Cutting The Rootstock Below The Coppicing Zone.

(SOURCE DEC 2009 ECOLOGICAL RESTORATION 27:4)

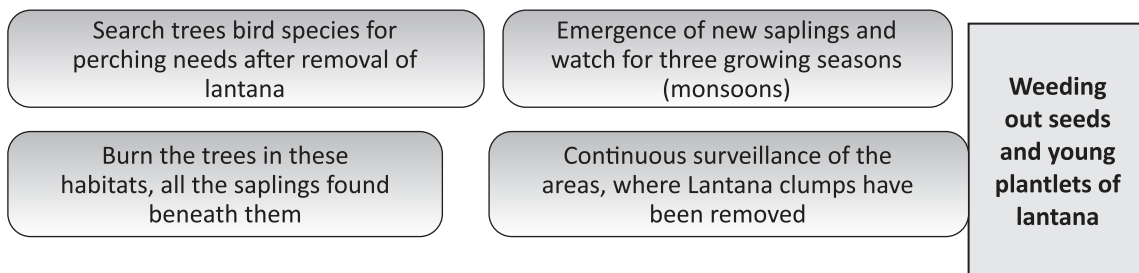
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INVASIVE PLANT SPECIES LANTANA IN CORBETT TIGER RESERVE OF INDIA**



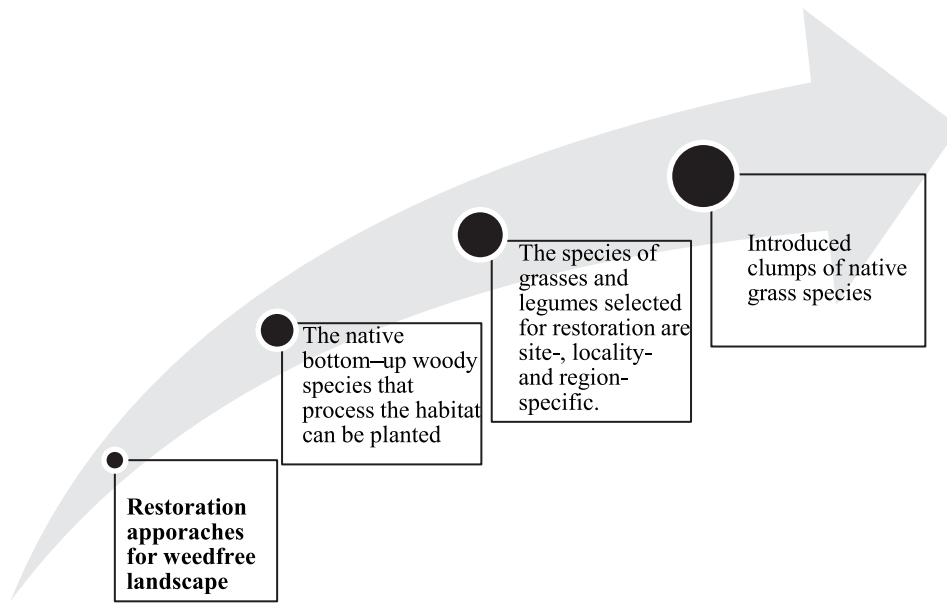
*Fig. 9 : Sequential Steps (a–g) Involved In The Removal Of Lantana By Cut Rootstock Method
(Source : current science, vol. 97, no. 10, 25 november 2009.)*

Component 3 : Weeding out of seedlings/young plantlets of Lantana : A systematic search for trees used by the generalist bird species for perching needs to be carried out after Lantana's removal, both from areas where Lantana is removed and its neighboring areas extending up to a radius of 1 km, vulnerability of the area. Habitats subjected to anthropogenic disturbances such as fire are more prone to invasion by Lantana. These habitats include habitat edges or ecotones (forest and grassland edge) and abandoned agricultural fields after resettlement of villages from forest areas. After location

of the trees used for perching by birds in these habitats, all the saplings found beneath them and along the surface run-off channels originating from the areas covered by them, should be removed manually and burned. Continuous surveillance of the areas, where Lantana clumps have been removed and the areas beneath trees used for perching by birds from where the saplings are removed, is necessary consecutively for three growing seasons (monsoons) for the emergence of new saplings.



*Fig. 10 : Process Of Weeding Out Planets And Seeds.
Source : Author*



*Fig. 11 : Restoration approaches after Weed-free landscape.
Source : Author*

Component 4 : Ecological restoration of weed-free landscapes : If the weed-free landscapes are not ecologically restored, reinvasion by Lantana or secondary invasion by some other alien/native weeds such as Parthenium, Cassia tora, C. occidentalis and Sida takes place. Therefore, ecological restoration is critical in the management of Lantana in the forest ecosystems. Weed-free landscapes in open areas can be easily restored to grassland communities by planting rooted ramets or clumps of native grass species or by broadcasting pellets containing seeds of grass species. If the weed-free landscape has to be developed into a forest ecosystem, the native bottom-up woody species that process the habitat can be planted along with grass species or can be introduced in a sequential manner. Ecological restoration should be carried out concurrently with removal of Lantana without much of time lag. The species assemblages of grasses and legumes used for ecological restoration vary across the ecological gradients, and thus the species of grasses and legumes selected for restoration are site-, locality- and region-specific.

6. Implications Of Plant Form And Soil Seed Bank Of Lantana On Its Management : It is noted that Lantana has a characteristic root system with a main taproot that penetrates vertically up to a depth of 1 m and with lateral

roots that grow horizontally up to 5 m in the top 6 cm soil horizon. Such root architecture makes it easier for pulling the clump after cutting the taproot beneath the coppicing zone, i.e. at 3–5 cm depth of soil without much disturbance of the soil. In cut rootstock method the disturbance of soil is minimal, and therefore least number of scarified seeds from the soil seed bank are exposed to light resulting in sprouting of few seedlings of Lantana at the site from where mother clumps are removed. The cut rootstock method developed by us is the outcome of our understanding of the biology and ecology of Lantana and the reasons for the failure of established control methods. The advantages of the cut rootstock method over other methods are: (i) less labor intensive, (ii) practically no regeneration from the cut Lantana clumps, (iii) minimum disturbance of the soil, (iv) reduced germination of Lantana seeds on the eradicated site near the mother clumps, and (v) cost effectiveness, depending upon the intensity of Lantana invasion and topography of the area). These observations were based on the analyses of the sites where physical grubbing and cut rootstock methods were used for the removal of Lantana in forest areas of Corbett tiger reserve.

The advantages of the cut rootstock method over traditional methods developed by the restoration team of forest department of India

Practically no regeneration from the cut Lantana clumps	Minimum disturbance of the soil	Reduced germination of Lantana seeds on the eradicated site near the mother clumps	Less labor intensive	Cost effectiveness
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*Fig. 12 : The advantages of the cut rootstock method over traditional methods in forest areas of Corbett tiger reserve, India.
Source : Author*

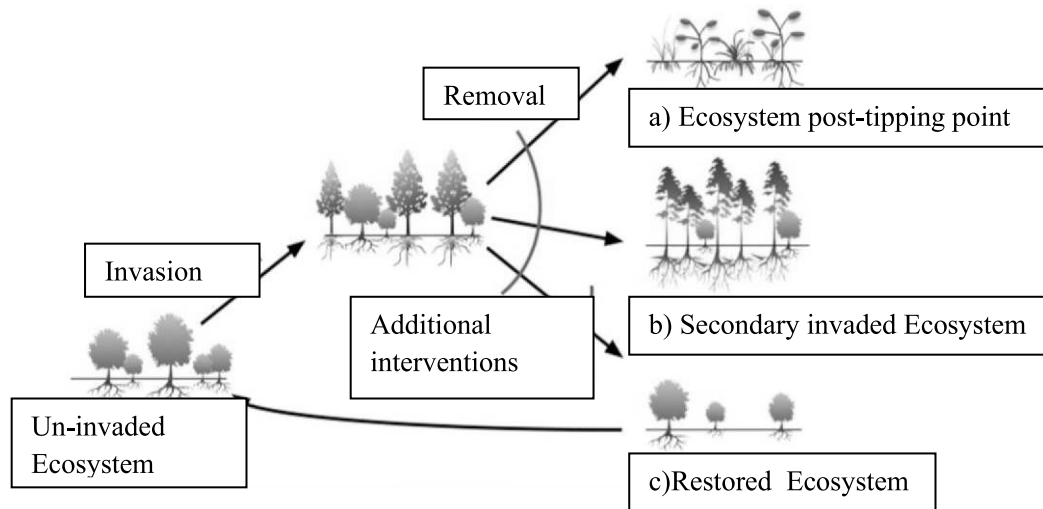


Fig. 13 : Three trajectories for removal of invasion for forest ecosystems.

7. Dispersal and Germination of Seeds and New Management Strategy : One of the important aspects in the management of Lantana invasion is the prevention of spread, reinvasion and secondary invasions by other weedy aliens in areas from where Lantana is removed. The fruits fallen beneath and around the mother clump do not germinate immediately because of the boney endocarp around the seed; only after natural scarification of boney endocarp by microbial degradation and subsequent exposure to light, the seeds germinate. Some old buried seeds brought to the surface through the activities of soil animals may germinate. On the other hand, the seeds defecated by fruit foraging birds/herbivores germinate whenever sufficient moisture is available, as boney endocarp is scarified as it passes through the digestive tracts of frugivores. Some of the defecated seeds are carried by monsoon water and deposited all along the surface drainage channels and along riverbeds. In Corbett Tiger Reserve *Gardinia turgida* and *Zizyphus maurtiana* are the most common perching trees. It is that observed 500 saplings of Lantana under a single tree of *G. turgid*. It may be noted that the timing of removal of Lantana in India should be before the onset of 'seasonal rains' to avoid the flowering and fruiting of a number of Lantana clumps. Otherwise, these clumps will set fruit and provide seed material which can be dispersed by birds and other animal dispersal agents over a large area to start new invasions after monsoon. Seed production has to be virtually eliminated, if a weed has to be eradicated successfully. Seeds of Lantana remain viable for many years and can contribute to nearly 50–70% to the total soil seed bank where Lantana is present. One of the major reasons for recolonization of weed-free areas is that the seeds of Lantana remain viable in soil for a long time and sprouting of Lantana seeds takes place whenever the seed is exposed to light. The sprouting of Lantana seeds and their establishment can be further prevented by restoration of the weed-free landscapes to grassland communities.

- a) Return to original community. Requires modification of habitat, reintroduction of native species.
- b) Persistence of legacy of the removed invader through secondary invader or by other invasive species.
- c) Movement of past tipping point that prevents the ecosystem both from original ecosystem and pre-invasive system. These can be applicable to invasive belowground consumers and aboveground consumers to transform the ecosystem. Source: Forest Invasions David A. Wardle Duane A. Petzler, Springer

8. Positive Outcome / Results : Using the new management strategy outlined here, Lantana has been successfully removed from the three plots of varying size (2–5 hectares) in Corbett Tiger Reserve and the weed-free areas have been restored into luxuriant grasslands. After three years, the newly developed grasslands are visited by large herds of deer, along with wild boars and elephants. The frequency of wildlife sighting has also increased in these plots. Several grassland birds have been using these restored habitats for foraging and nesting. Following the strategy developed, the Management of Corbett Tiger Reserve has successfully removed Lantana from 1600 hectares and restored the weed-free landscapes to Grasslands. The Forest Department of Uttarakhand has undertaken eradication of Lantana on a massive scale using the new management strategy. Keeping in view, the fact that the national parks and wildlife sanctuaries are repositories of biological heritage and that the invasive species such as Lantana threatening the very biological heritage for which the protected areas were established, ensuring the conservation of biodiversity in forest ecosystems.

9. Conclusion : This is a Review Paper, Studied and Analyzed from the existing presented papers and reported the Topic. Choose the ecosystem type as forest ecosystem- Forest invasions. The case investigation– forest invasions- Corbett tiger reserve of India (Uttarakhand).

Lantana has become a menace in forest ecosystems and is distributed across the tropical and subtropical India. A wide range of physical control measures have been followed in the management of Lantana weed, but without success. The failure of the physical methods used is due to certain biological and ecological attributes of the weed that made the methods of control ineffective, and enabled the weed to invade rapidly far and wide through dispersal of seeds by mutualistic frugivorous birds. The new cut rootstock method coupled with weeding of saplings under the trees used for perching by generalist birds and subsequent restoration of weed-free landscapes to grassland/ forest community can eradicate Lantana successfully. Understanding of the natural histories of other invasive weeds will enable to evolve effective and efficient management strategies for their containment in the forest ecosystems.

1. The information on dispersal process, life-history, controls and population of invaders facilitate to control the invasions should be collected.
2. Information On effects of invaders on ecosystem processes can contribute more understanding of disturbed conditions.
3. Information on the pathways which both natural and anthropogenic disturbances including restoration management activities, study of individual species, native, non-native helps to identify the ways of disturbance and suggest pathway to restoration.
4. Information on phenology (the study of cyclic and seasonal natural phenomena, especially in relation to climate and plant and animal life) of growth and resource uptake of species ecosystem could be used as a tool of restoration.
5. The ability to use preventive management or restoration effectively to maintain ecosystems that are both resistant to invaders and resilient to disturbances will depend on the characteristics of the ecosystem interest as well as those of the invaders.

REFERENCES :

1. Kumar, V. and Subramaniam, B., *Chromosome Atlas of Flowering Plants, Dicotyledons, Botanical Survey of India, Kolkata, 1986, vol. I.*
2. Love, A., Naik, D., Basak, S. K., Babu, S., Pathak, N. and Babu, C. R., *Variability in foliar essential oils among different morphotypes of Lantana species complexes and its taxonomic and ecological significance. Chem. Biodiv. (in press).*
3. Rajendran, A. and Daniel, P., *The Indian Verbenaceae (A Taxonomic revision), Bishen Singh Mahendra Pal Singh, Dehradun, 2002.*
4. Kohli, R. K., Batish, D. R., Singh, H. P. and Dogra, K. S., *Status, invasiveness and environmental threats of three tropical American invasive weeds (Parthenium hysterophorus L., Ageratum conyzoides L., Lantana camara L.) in India. Biol. Invasion, 2006, 8, 1501–1510*
5. Sharma, G. P., Raghubanshi, A. S. and Singh, J. S., *Lantana invasion: an overview. Weed Biol. Manage., 2005, 5, 157–165.*
6. Day, M., Wiley, C. J., Playford, J. and Zalucki, M. P., *Lantana: current management status and future prospects. ACIAR Monograph, 2003, 102, 28*
7. *Restoration Ecology. Volume .25., no.5 pp.668-673*
8. *Soils-the final frontier*
9. *Ecological Restoration for Protected Areas ,Principles, Guidelines and Best Practices, Prepared by the IUCN WCPA Ecological Restoration Taskforce*
10. *December 2009 ECOLOGICAL RESTORATION 27:4 469*
11. *Available on-line at http://www.doi.gov/bpp/data/PPP/DOI_StrategicPlan.pdf*

12. *Issues in Forest Conservation Rehabilitation and Restoration of Degraded Forests David Lamb and Don Gilmour, September 2003*
13. *Corresponding author : Funk, J.L. 0169-5347/\$ – see front matter 2008 Elsevier Ltd. All rights reserved. doi:10.1016/j.tree.2008.07.013 Available online 24 October 2008*
14. *Tropical Ecology 56(1) : 111-123, 2015 ISSN 0564-3295 © International Society for Tropical Ecology www.tropecol.com Do alien plant invasions cause biotic homogenization of terrestrial ecosystems in the Kashmir Valley, India? PERVAIZ A. DAR*& ZAFAR A. RESHI ,Department of Botany, University of Kashmir, Srinagar 190006, India*
15. *Biotic Invasions : Causes, Epidemiology Biotic Invasions: Causes, Epidemiology, Global Consequences and Control by Richard N. Mack, Chair, Daniel Simberloff, W. Mark Lonsdale, Harry Evans, Michael Clout, and Fakhri Bazzaz*
16. *INDIA : Invasion of Exotic Weeds in the Natural Forests of Tropical India due to Forest Fire- A Threat to Biodiversity, (IFFN No. 27 - July 2002, p. 90-92)*
17. *"Executive Summary." National Research Council. 2002. Predicting Invasions of Nonindigenous Plants and Plant Pests. Washington, DC: The National Academies Press. doi: 10.17226/10259*
18. *Plant Invasion in India: an Overview, R.K. Kohli, D.R. Batishi, J.S. Singh², H.P. Singh³ and J.R. Bhatt⁴*
19. *THE NATIONAL ACADEMIES PRESS, Visit the National Academies Press at NAP.edu*
20. *How to Achieve Effectiveness in Problem-Oriented Landscape Research: The Example of Research on Biotic Invasions, Christoph Kueffer Department of Botany, University of Hawaii at Manoa, Honolulu, U.S.A.*

Post Pandemic Architecture Competition

An IIA - Karnataka Chapter Initiative

CATEGORY - A

WINNERS (from 145 Essays)

1st Place : Prof. Sathya Prakash Varanashi

IIA Number : A-8382, IIA Karnataka Chapter - Bangalore Centre

Topic : **POWER OF THE INDIVIDUAL**

the first and last solution to pandemics

QUESTIONING THE QUESTION

Corona times has been a time not only to cure the sick, but to question the self as well. Expectedly, architects may ask - How will architecture respond to a world in future when pandemics will be a part of our lives? How can our living environment be better prepared for the next lockdown that may be even longer?

So, the writing on the wall is clear. We are seeking change. Lao Tzu said "If you do not change direction, you may end up where you are heading". Very true, but unless we know where to head, can we change directions?

Architecture, as socio-political manifestation and economic expression of our times, will reflect upon and respond to future world. But would there be a discernible shift, like the kind affected by major causes of the past - structural innovations, design options, new materiality, effective technologies for HVAC, newer software or iconic visions? It may be safer to say 'No', despite predicting few specific material changes and minor shifts in design approaches. Typically, health matters have not impacted on the design criteria of most building types, with of course exceptions in hospitals, hotels or prisons.

Besides being a societal phenomenon, architecture is also a creative and collaborative outcome of a professional group called architects. Reframing the question, will architects respond to a pandemic future, the answer may repeat as "No", with the exception of a small number of thinking architects. The majority of Indian architects are forced to practise within the imperatives of market economy, political subversions, unfair competitions and the pressures of earning. This could be a debatable argument, yet very few architects will be powerful enough to step out of their insular practises, to convince owners and promoters to accept their own architectural wisdoms post corona.

Even as we panic, the questions appear to suggest pandemic lockdowns will be omnipresent forever, so we need to plan our responses. If we were to look back in retrospect studying the past, our proposals may fail, not because our prescriptions were impractical, but because the future pandemic may be

different. Cholera could be controlled by clean water, now corona by social distancing and the future germ will have its intrinsic weakness for us to exploit. Of course, this does not mean proposing for future will be futile, only it could be limited in application.

Equally well, the danger of our well-intended ideas being appropriated, co-opted and subverted by negative socio-political agendas, be at local or at national levels, always lurks behind. The ideal we aim for may never arise, as Covid - 19 mutates, contexts change.

Given this, our analysis needs to go beyond the current crisis. Post pandemic, we need to plan our future directions, but more so, ponder over our past deeds. The wisdom dawning from the past and present together, may enable us to face further pandemics.

PANDEMICS - A PROGNOSIS

The most easy and acceptable prophecy for future appears to be the return of 'business as usual' model, with a revengeful pace for revival of economy. It's not a casual guess, but emanates from what lessons have we learnt from earthquakes, tsunamis, floods and such other catastrophes. Few development models might have got modified, but our impulses for power, popularity, profits, comforts and social image were so strong, we could not change our directions unlike Lao Tzu suggested.

However, corona crisis cannot be taken lightly. Beyond being provincial, exclusive, racial or casual in its spread or impacts, it has been pervasive across the globe. Considering human psychology, corona has created such an intense threat, we may suspect for a long time, what if the other person is infected. Alternatively, we may change our lifestyle for healthier future - health of humans, flora, fauna, all species and the Earth as a whole.

Homo sapiens have disrupted the web of nature, so nature is retaliating. Instead of attempting to return to our original web, most of the affluent, administering, educating, informing and marketing people have moved into the web of internet. Even during the corona crisis, speaking metaphorically,

we communicate, create, entertain and work, asserting that we are the masters of nature. Our indefatigable anthropocentric ego does not let us think nature, humbly.

If the forgone argument is valid, our response to the future, be it architecture, built environment or any other, would again be to position human supremacy above powers of nature. Once corona is won over, we may insulate ourselves even more and prepare to be in a defensive mode. Though the direct impact of pandemics could be less on design and construction activity, it could suggest lasting changes in policy framework for cities, settlements, urbanisation and living environment.

The pandemic has shaken us, with urbanization being among the hard hit, a common denominator for large number of ills of our times. Resource consumption, social inequity, power promotions, self-centeredness, un-sustainable development, economic battles, corporate hungers – name any, urbanization appears to have a role play. The visible face of globalisation is urbanisation. Can the pandemic awaken us to prescriptions of localisation, a movement Helena Hodge has been spearheading?

Will the pandemic awaken us to the paradoxes of ecology and economics? Economic growth proponents believe we can have prosperity with ecological balance and can live our lifestyle amidst the climate crisis. If corona continues, unfortunately the poor will suffer, but at least few of the privileged may introspect their lifestyle today - accumulating assets, creating an identity, insuring the security, amassing wealth, seeking comforts, networking for name, travelling for holiday- it's a never ending list of what not to do if we were to live with nature and without pandemics.

Post corona, should our responses be in supremacy mode, look for survival mode or should we seek sustainable modes? Can what matters be how meaningfully, happily, socially and naturally can we live?

PROJECTS OF THE FUTURE

Internet is already getting overloaded with post corona predictions, possibly also on architecture and environment. Gubbi group, a pan India group of 20 architects professing and practising sustainable architecture are on their way to put a dossier on this future with multiple directions being addressed.

Let us anyway take a fresh look, not so much on 'how will' architecture respond, but on 'how should' architecture respond. If corona has made us live a life that was the norm 50 years ago - without or with minimal AC, flights, supermarkets, private transport, eating out, e-commerce, couriers, manufactured materials and many such others – can architecture also do so?

AC has been among the major carriers of germs, so let us try living without or minimal air conditioning. Re-look at the way masters of Indian architecture designed early on, be it Correa, Kanvinde, Doshi or Baker, they all designed without AC.

It's actually simple to have an eco-friendly building - design considering heat, light, air, rain, humidity, glare, sound and space. These 8 eco design sutra's will ensure healthier, germ free spaces to live, learn and work.

Multi-functionality and adaptive reuse have been among the genius loci of Indian architecture and settlements. There can be thousands of examples from a courtyard house on the eve of a family wedding to the extreme demands of Shivarathri on Varanasi ghats. Modern architecture and town planning have diverted us from these time tested approaches. May be it is time we re-approach them.

Most of our cities have no proper town plans, towns with plans have no neighbourhoods, the few neighbourhoods we can claim have no community spaces and the few community spaces we can identify have no urban design. Yet, town planning and urban design are studied in every school of architecture, besides many taking them up for higher studies. Hundreds of Indian firms claim capacity to be consultants in urban matters. Many modern urban theories like sustainable urbanism or new urbanism which explore better living environments, have been part of Indian history and continue to be with us even today.

Given this expertise, every Indian settlement can be re-designed or redeveloped for better living as a future pandemic ready city. To that end, the 74th amendment to constitution, mainly the idea of decentralised governance with powers to urban local bodies and ward committees may have to be implemented.

Natural materials like mud, brick, wood, stones, bamboo and such others are not known to be germ friendly, unlike the factory made products for construction, besides being low on embodied energy, chemicals or waste production. So, simply minimise manufactured materials and research on natural ones towards greater efficiency. Lest, even the natural materials will run out one day!

Arresting pandemics will be easier in smaller spaces, so we need to build every building small. Large sprawling spaces with great indoor heights and volumes like modern airports, prestigious hotels, corporate offices, and even hospitals today with lavish interiors and luxurious materials are nothing but a sheer waste of Earth resources, looted from mother Earth. Besides the humongous costs both in capital and operating expenses, keeping them hygienic is a challenge. Shorter spans with multiple courtyards and staggered balconies may serve many building types, if not all. Of course, specialised buildings will demand specific design solutions to maintain them germ free.

People are already leading fairly individualised living due to gadgets like laptop, smart phone, and many others. Pandemics may force us towards greater indoor isolation. Internet enabled information, communication and entertainment would mean, we live cocooned within our houses. It is too early even to hazard a guess, how it will impact on architecture

of future. However, such scenarios do not sound too well for a healthy society and humanity at large.

Corona has been an extraordinary problem, demanding an extraordinary solution. Not to blame it, for we all wish to live an extraordinary life, stimulated by modern times of glitzy world of architecture awards, scintillating media, social image, individual identity and an enviable bio data. Philosophically, if only we could live ordinary, frugal, simple and humble, thousands of problems of pandemics and such others can be resolved, if not fully eliminated. Can architecture of the ordinary emerge as an acceptable solution to the future?

THE INDIVIDUAL AS A SOLUTION

Every other architectural design or settlement policy one may think of as a response to the future seems to be already in the public realm. However, the real solutions to pandemic lock down may not lie either in architecture or in our living environment. Those real solutions may be lying within us, the individuals.

It is we as individuals who need to respond to a world in future. We are not Gandhi's and Mandela's, but will we take the corrective actions, without worrying if others follow or not?

Corona control was possible due to individual actions, albeit it being forced by regulation and enabled by communication. We as a global population, with varying degrees of sufferings, have proved that we can face a crisis. It is corona today, could be climate tomorrow. Climate crisis lacks the immediate danger posed by virus, but someday it could be too big, with no antidote.

Corona unleashed an unseen threat and exposed our fear of death. Hence this unbelievable quarantine and isolation. As we prepare ourselves for future pandemics, the human instincts of safety and security may override the real needs – empathy for the bio-diversity and living with nature. We may continue in our own make believe anthropocentric attitudes to secure our future and not care for the species going extinct or even of our Mother Earth. We may face another mutated virus.

This is true. Learning deeply about corona is actually learning deeply about ourselves. This learning should be the first step towards designing for post corona times. This learning should come from heart and mind, analytically, theoretically, spiritually and philosophically. If we fail in learning about ourselves, it's a lost opportunity not only for post corona society, but also for humanity, sustainability and equity.

Jury Comments

DR. CHRISTOPHER COWELL

This is a sophisticated and somewhat brutally mature assessment of human nature in the face of the coronavirus pandemic. It asserts that before we can even begin to design for a post-COVID society we need to learn about ourselves more deeply, an act that is intrinsically pre-architectural. Indeed, architecture is presented as a tool that has already exhausted its armature of solutions, meanwhile architects are constrained by the market to not provide solutions that escape the past status quo. This Gordian Knot is not untied here, but rather examined by the writer, and the prognosis forces one to explore the forces at work that keep it tied up, its locus within the urban. There are some lovely arguments on India's traditions of adaptive use (from family weddings to Shivaratri along the ghats at Varanasi), and on the paradoxical relationships between the (modern sterility) of town planning and most Indian cities, communities, neighborhoods. The solution, it seems, lies not within architecture, but individually within ourselves.

AR. MADHAV RAMAN

This essay stood out from the others because it carries all the hallmarks of good writing. It is extremely well structured and written in simple crisp language. It unravels the very points it makes elegantly, in a measured and cogent manner. It resists the urge to throw hyperboles of solution seeking or prescription writing and ends up lyrically indicating where redemption will come from : within ourselves.

MS. MEERA K.

This essay shifts the attention from the government and the larger society, which we tend to blame for all ills, to each of us. The writer makes it clear there are no quick fixes, that nothing can change, without each of us taking action as individuals. He takes a step back, places the challenge in the context of social and political realities and points us in the direction of decentralised governance to enable change. Clearly a nuanced understanding of the challenges and way forward!

AR. VAMI KOTICHA

The essay examines the role of human beings on this planet and argues for the anthropocentric ego as the true pandemic. It lays out the problem of pandemic and the role of the architect in such a scenario, but quickly evolves into an introspection which elaborates on what the author defines as the real problem. It was particularly interesting how the author's opined; ordinariness is the solution to extraordinary. The essay further reinforces this with references to the architecture of adaptive reuse, natural materials, localized byelaws & minimalism, among others. The clarity in the hypothesis & structured argument made this the winning entry.

2nd Place : Ar. Mahesh Deepak Shirke

IIA Number : 18382, IIA Maharashtra Chapter - Nashik Centre

Topic : POST PANDEMIC ARCHITECTURE

Pandemic Lockdown : A Welcome Pause for Contemplation?

Corona Pandemic and its consequential worldwide lockdown have provided us the necessary pause and time to review about how one should revisit the idea of **habitat**. This pandemic, its lockdown measures, and its adverse effects on physical, mental, social, and economic health are essentially an 'urban' phenomenon. Of course, the rural migrants are also getting severely affected by this pandemic and lockdown; however, the real difficulties and containment of virus-hotspots are still being the metro-cities related issues. In that sense, the idea of post pandemic architecture cannot be considered in isolation; as merely about the building typologies; but should be considered in context of the city and its planning as a whole. In this text, one would like to briefly suggest a few points, which one feels necessary to draw attention of the architectural fraternity towards them.

Who Will Suffer From The Lockdown The Most?

Although the obvious answer is '-the poor', it's not that simple. Of course, a 2000 square-feet flat owner or a grand 8000plus square-feet bungalow owner would not much bother about the extension of lockdown; but a slum dweller would surely be in great mental, physical and economical agony caused by such lockdowns. Because our cities have failed to provide basic urban spaces- both personal and public- in balanced proportions to this poor labor-class and lower income groups. When such unprecedented threat like corona pandemic occurs, we suddenly become exposed to our urban planning failures. Luckily, we are facing this pandemic and lockdown in summers; what will happen if the lockdown is to be extended and rainy season is started? Who will then cater to the food supply chain, drainage cleaning, and stop possible flooding of our cities? While discussing the urban problems, sadly we have reduced ourselves to think majorly regarding either the urban-transportation issues like metros, flyovers etc.; or FSI and zoning related issues. But urban planning principles, such as equilibrium of population density, self-contained zones, pedestrian permeability and clutter-free road network through different zones, are mostly overlooked. The discourse of **Post pandemic architecture** should not be merely considered about finding some mechanized alternatives of better sanitized dwellings, space-efficient hospitals plans, or lock-down friendly housings solutions; all these solutions are also welcome; but the real opportunity lies in taking a holistic review of our integral urban planning ideals and architectural principles we adhere. One knows that the answers won't be simple, but if we could raise the right questions, we could lead towards the right solutions, in the long run.

The Necessity to Have a Fundamental Right of 'Habitation Space'

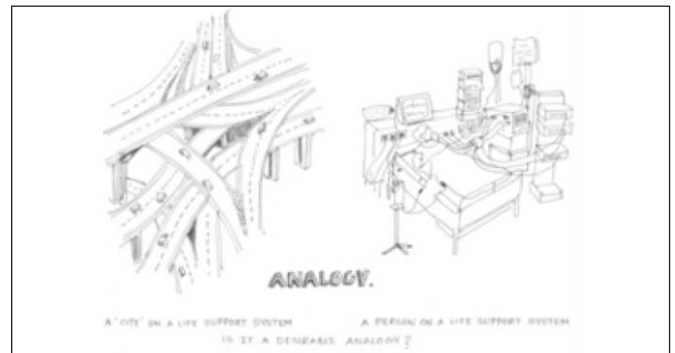
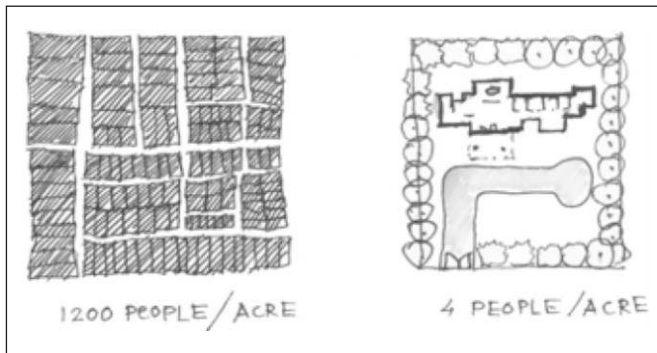
When a rich family of 3 people asks any celebrity architect to design a bungalow (or a farmhouse) on their acres of big land with around 8000-12000 square-feet plus built-up area, we architects put all our creativity, time, and emotional investment in such project, right from its design, execution, documentation and 'publication'. We hardly realize how we are becoming the subtle instruments of severe social injustice regarding the '**habitation space**'. We never question such ultra-lavish design brief itself; whether it is justifiable to provide 6m x 5m master toilet area just for the sake of luxury? In that same 30-to-40 square-meter of area, a low income group dwelling accommodates nearly 4-to-5 people for their lifelong occupancy. The idea of personal luxury and its co-relation with physical square-feet space is to be seriously rethought by the architectural community; and there needs to be some humanitarian 'ceiling norms' on how much minimum and maximum physical space a dwelling unit should consume. As an architectural fraternity, we all must rethink whether we should actively contribute in this unnecessary, unnatural and greedy hunger for luxury for a few people. Compared to private luxury residences, more focus and energy need to be given in creating '**spatially balanced**' built environments for a larger section of the society. Architects themselves have created this **myth** about 'spatial luxury' for the rich and elite class; and only architects can demystify it by providing balanced and meaningful 'spatial' alternatives to all classes. Let's consider an example from automobile industry. A luxury sedan has 5 seats; and an economical hatchback also has 5 seats. For both cars, the '**physical spatial requirements**' are generally the same but the luxury levels are different. In the same manner, we architects should reinvestigate the definition of '**spatial luxury**'. And unanimously, we should also be able to draw a clear distinction between 'essential spatial luxury' and 'greedy spatial luxury'.

The 'Density' Management

"The palace is not safe when the cottage is not happy."

- Benjamin Disraeli

To control any pandemics or natural calamity for that matter, mostly the areas with high density population prove to be the biggest challenge to handle. A small village with low density can be easily made quarantine. But it is very challenging to quarantine a biggest slum area such as 'Dharavi' for example? Aren't slums an outcome of our urban density mismanagement in cities? Here, **Density** implies not only regarding the human population, but also, the density of structures, the density of roads and flyovers, density of property rates, density of facilities, density of opportunities,



and so on. Unless we bring some **equilibrium** in this density management, such pandemic situations will continue to become even more and more critical and fatal in near future.

Revisiting the Concepts of FSI, Development Control Regulations and Development Plans

This point is in logical continuation with the previous point. The above mentioned issues are mainly **policy** based; and our present day cities-good or bad- are mainly the outcome of these '**big threes**'- **FSI, DC rules, and Development Plans**. The FSI is fundamentally a **manmade**, and precisely a **bureaucratic** concept. It has become a major instrument in deciding social and spatial hierarchy of our built environments. Higher FSI means higher profit ratios, higher property rates, and so on. But while opting for this, we often tend to ignore the fundamental capacity of land, city, people, resources, and even the culture of that place. Such concepts (like FSI) have largely transformed urban-Indian residential architecture into a mere '**mathematical statistics**' of carpet/built up areas, its planning related juggleries, and legal tradeoffs; and architects converted into 'creative statisticians' of FSI. The built developments essentially based on such bureaucratic or academic statistics are going to fail miserably while combating with the real-life threats like pandemics or natural calamities. Our present day Metro-cities have failed to offer something meaningful in terms of enrichment of human life; what they are really offering?-Poor air quality, traffic-jams, social injustice, extremely unhygienic living conditions to the vast majority of people. If we keep on ignoring all this, our future generations will surely rethink on such profit and bureaucracy driven concepts of city planning. A Solution then ?- The developments with balanced urban density, adequately spaced land uses, self-contained zones with nearby farmlands to ensure food supply, having adequate green areas, and less dependency on mechanical and high energy consumptive ways of living, will be the key solution for future generations.

Need Of Diversion from Transport Oriented Cities to Self-Contained Peaceful Towns

'A car is the measure of all things'?

In the context of a city, now it's time to re-consider this concept. It's time to shift this idiom again to Protagoras's old saying that '**man is the measure of all things**'. A single car really demands too much from **Architecture**. A Lot of parking

space, if the parking is on podium- structurally very heavy RCC slabs, ramps, car-lifts, large width of roads, turning radiuses, lot of paved surfaces in the city that don't absorb water in rains and encourage flooding and become heat-islands in summers, and above all, a very confusing (and ugly?) network of flyovers. All this infrastructure architecture demands a heavy price also, in terms of adverse environmental impact and energy consumption. Flyovers are the cheapest form of 'development model' that can be shown by political fraternity to amuse common people. Compared to its real usefulness, energy and material consumption, occupied physical space in the city, construction time and inconvenience caused; a flyover contributes very less in terms of enrichment of city-life and its built environment. We all need to rethink our beliefs in such mega-infrastructure 'white-elephants', and should analyze the possibility of finding other economical, space saving, and environment friendly alternatives for local transport. Revival of '**Trams**' in India should also be an important point worth to be reconsidered. An economical and deeply accessible '**net**' of an urban '**Tram**' is architecturally a more favorable solution than providing multi-story podiums and basements for parking in every building. These ancillary spaces are taking too much of meaningful architectural space and material resources of a city. If we could follow the basic principle as, **where there is a road- there will be a Tram nearby**, we might reduce nearly 40% of our vehicular needs, and save the cost on related infrastructure. This saved cost and energy can be creatively used somewhere else, like social housing, healthcare and recreation architecture for that matter.

The Difference between Iconic Architecture and Egoistic Architecture

'Iconic' architecture is different than 'egoistic' architecture. Present day, iconic architecture largely means fantasies of 'Form', attempts for large size cantilevers, exuberance of surfaces, finishes, and installation of high-end mechanical aids in order to make buildings work. While achieving this, we often tend to forget the huge loss of embodied energy involved in making, materials transport, and consequential environmental damage. For future, we all need to re-establish the concept of meaningful Iconic architecture, that won't be much dependent on 'how large a cantilever is'. A small well designed 'hut' may also become iconic. If we could at least slower – if not stop - the race for this (personal) egoistic

Iconism, we could surely save a very precious chunk of resources of environment, land, water, trees, and human energy. This would be a **passive role of Architecture** to save the environment. And the saved environment ensures a much better protection against any disease or pandemic.

The 'Real Green' Concepts

The core idea of mechanically-aided and technology based green concepts is to be seriously re-visited. To build such so called green buildings, the indirect loss of energy and environment is so underestimated. A real 'Environment friendly architecture' will be naturally more immune and livable during such pandemics. In an Indian context; after making the whole glass cladded commercial building equipped with all mechanical ventilation and air conditioning, and taking pride in subscribing the fact that the air-conditioning installed is 'five star' rated, is like a tobacco manufacturer erecting a cancer hospital; equally immoral and futile. The promotional policy of extensive usage of imported finishing surfaces and stones is also to be rethought. Local craft and materials need to be promoted by the mainstream architectural fraternity. An attempt to **'Save the Process'** during the construction should also be considered as an

integral green initiative. There lies a need to comprehensively review the green architectural concepts, in order to assess their real merits and demerits.

Changes in Working Environments, Work Culture, and Architectural Education

We are humans. Our creativity, energies, life spans are limited. The current architectural practice and architectural education are mostly focusing on aesthetical, technical, and municipal aspects of design and construction; which is fine. But there arises a need now, to involve and inculcate social, moral and humanitarian aspects of architecture in architectural curriculum to some deeper extent. Concepts like **portable architecture** or **portable city** should be explored further; such 'city' itself can be migrated to safer zones in the event of such pandemics. Architecture is generally considered as the 'mother of all arts'. More than the electronic and social media, now **Architecture** should become the catalyst of 'Social Change'. In some sense, fundamental steps taken by the architectural fraternity would transform the core DNA of the world's built environment. This transformed DNA will be more compassionate towards solving urban or rural issues and will be more immune to any pandemics.

Jury Comments

DR. CHRISTOPHER COWELL

Despite some predictable ideas about over-playing the transformative power of architecture in solving societal problems in a post-pandemic India, this is, nevertheless, a quirky and provocative piece of writing. Yes, it is somewhat unfocused and scattergun. It moves from class, to density management, to car infrastructure, to air conditioning, to building materials. However, it is both provocative and individual in offering insights. What I found particularly fascinating was the idea that luxury could be decoupled from scale in architecture, thereby satisfying status-driven wealthy and providing similar space for working-class families, the analogy given was the similar ergonomics of scale with most price ranges of cars. More could have been made of this ingenious thought, as could the idea of reintroducing trams. There were wonderful, memorable lines, such as: "A single car really demands too much from Architecture;" "Flyovers are the cheapest form of 'development model' that can be shown by [the] political fraternity to amuse [the] common people." And my favorite: "In an Indian context . . . taking pride in subscribing [to] the fact that the air-conditioning installed is 'five star' rated, is like a tobacco manufacturer erecting a cancer hospital." The rhetorical bite is great.

AR. MADHAV RAMAN

This is very organised writing. The authors skill is revealed in being able to present the enormity of impact the pandemic would have across space making in a clear-eyed concise sectional views of the work ahead for space makers. Each section slices very quickly to the core issues that define a cause for action for architecture, which is dealt with in a sober and sobering manner.

MS. MEERA K.

The writer is blunt about the role of architects, who have become instruments of social injustice — by not questioning the hunger for spatial luxury, not questioning design briefs meant to just feed egos and ignoring public good. An insight that all professionals can do with!

AR. VAMI KOTICHA

The author discusses some strong views on architecture as a catalyst for social change. The essay paints a vivid image of architectural injustice that exists in the profession currently and then goes on to discuss several urban planning basics like density management, land capacity, self-sufficient localized developments and quantitative tools of measurements like FSI as solutions. While some of these idealistic solutions lack analytical critique, it still merits honor as it displays a strong rhetoric and a passion for change.

3rd Place : Ar. Bindi Saolapurkar (Team Lead), Shloka Kumar (Team Member)

IIA Number : A-12519, IIA Karnataka Chapter - Bangalore Centre

Topic : **POST PANDEMIC ARCHITECTURE**

Let me begin by divulging that I have never designed a building, nor studied how to. Fortunately for me, this is an ideas competition and architecture also means *“the complex or carefully designed structure of something.”* It is with this definition in mind that I would like to proceed.

I believe that we are all architects. Choice architects. Every moment we make a determination as to how to live our lives, individually and collectively, as a society, a nation, a species. Even simply maintaining status quo is a choice. The most significant thing that can come out of a crisis is that it exposes deeply rooted flaws in systems that we have been making do with for decades. It also exposes our own human vulnerabilities. In this essay, I am attempting to describe how I think we can be better architects with respect to how we design our lives, our society, our nations and our world.

Human absurdity

A global pandemic reminds us of our human frailty; that after having seemingly taken over the world as a species, we can be crushed by an invisible bacillus. This makes us introspect and start appreciating the simple things once again - the freedom to move, love, be wonderstruck, and lead comfortable and healthy lives. What reminds us of this is simply a magnified representation of a universal truth - that our lives can be snatched away from us at any given moment. But instead of living every day with joy and gratitude, we live as if we are immune to this inescapable condition, which leads us to behave in all kinds of unpleasant ways. This human absurdity has been beautifully explained by the French philosopher Albert Camus, in his novel 'La Peste' or 'The Plague'¹.

Our surroundings

One of the first things architects probably learn is the importance of light and space. My mother is an architect, and our whole house is centered around trees under a skylight.

Only as a young adult do I understand the huge influence it must have had on how I felt at home. Lockdown or no lockdown, I think that every home must have a balcony, garden, or a terrace, however small. And if we do ever have to confine ourselves to our homes for days on end again, the ability to step 'out' would play a big role in keeping us sane.

In a future where work from home may become more frequent, every house must have a separate study room for the most conducive work environment and to eliminate inconveniencing other spaces. Architects (the real kind) can also nudge clients into having a distinct space altogether, to escape the humdrum of everyday life as we know it. A quiet space, a creative space, *a thoughtful space* - where one goes to draw, paint, play music, exercise, do yoga, write, or simply -
¹ <https://www.youtube.com/watch?v=vSYPwX4NPg4>



pause. In a fast moving world such as ours, it is important to unwind and reprioritise every once in a while. This would not only help living spaces be better prepared for the next lockdown, but be better prepared for life.

The design of buildings should be much more risk-informed. For example, in flood prone areas, the electricity meter must be placed a little higher. There should be enough bathrooms and places to wash hands on every floor of a building/factory to ensure hygiene while maintaining minimal contact. Every slum must be redeveloped into low-cost housing with adequate facilities. This is not only to reduce the chances of the uncontrollable spread of a virus because of the impossibility of 'social distancing', but also to secure a basic human right that we have consistently failed to deliver - *dignity*.

Our policies - from the perspective of India in lockdown

At 8pm on the 24th of March, the first 21 day lockdown was announced. From then onwards, we watched our TV screens in shock, as migrant workers with no stable employment, no savings, no shelter and no food, with their bags and children, set off to their hometowns hundreds of kilometres away, *on foot*.



There are around 400 million migrant workers, and 800 million daily wage labourers in India. They build our cities, sweep our streets, and give us food to eat. Yet, they are invisible to us and surprisingly seemed to be invisible to our government while imposing a complete nation-wide lockdown. Please understand, I am by no means suggesting that handling the situation is an easy task, but surely a man-made migration of millions of people could have been foreseen?

In the same announcement that brought the economy to a standstill, the poor could have been assured of food and shelter wherever they were at the moment. Instead, the government took two days to announce the Garib Kalyan Yojana, as if in reaction to the lockdown instead of in anticipation of it, and this package still had no relief for migrant workers. As if this was not enough, these homeless labourers were then seen as being in conflict with the law and faced the ire of police and ignorant people alike².

Criminalising the body vs building trust

Unfortunately, law enforcement has a tendency to criminalise the body, seeing it as the vector rather than the host. Police in many states were seen beating and punishing people who stepped outside³. However, one state has been different. In Kerala, state police are not using physical force. They are using drones, which have loudspeakers and sirens to monitor movement, in order to tell people to go back inside⁴. Instead of simply enforcing the lockdown, the police are proactively playing a role in public health awareness and the provision of basic services to people by creating a police whatsapp group to arrange for door to door delivery of provisions. An app has been created to bring telemedicine to every person, broadcast through the loudspeakers. And finally, a decentralised health system and strong local self-government has ensured effective community participation⁵.



Indian migrant worker carries his son as they walk along a road with others to return to their village in New Delhi.

Kerala is showing us that a two way communication and dialogue is the key to converting fear into trust⁶. All of these measures have helped the state flatten the curve, so far, and 'the Kerala model' is being lauded, globally.

More State intervention?

Keeping the above example in mind, we must reflect on how we want the world to look moving forward, because one thing is clear - the world won't be the same again. This is not only because of a microscopic particle that has thrown all of our lives into disarray, but more importantly, the instruments that we choose to deal with it.

History has shown us that times of crisis are times of power grabs for States. This is known as the "Ratchet effect", wherein the scope of the government grows tremendously during a crisis, but never fully goes back to the way it was even once the crisis subsides⁷. For example, the 9/11 attack dramatically increased the authority of the State to surveil its citizens.

Think for a moment about the narrative that we have been hearing when it comes to responding to the pandemic, at least in India. It is primarily the Central Government announcing major measures like the lockdown, bureaucrats forming committees to announce relief packages, state governments with state-level measures on health, agriculture and the economy, the police who are enforcing the lockdown, and of course NGOs and civil society organisations who are doing most of the relief work on the ground. *Why has it taken so long to deploy our local governments?!*

The 73rd and 74th amendments to our Constitution were passed in 1992 to empower gram panchayats and urban municipalities. As we have seen in Kerala, they are logically the best placed to deliver on-the-ground solutions during a health and humanitarian crisis in India's large, unique and diverse landscape. Opinion surveys have found that citizens have high levels of trust in village panchayats and municipal commissioners, and extremely low levels of trust in police and other government officials⁸. Yet, we continue to pursue top-down strategies.

At this moment, we get to choose how to respond. We can either invest in our local self governments, the largest body of elected officials in the world⁹, and rebuild faith in our public systems, or build capacities for enforcement and policing thereby reinforcing the trend towards unwarranted state intervention which may have negative consequences in the long term.

² <https://www.bbc.com/news/world-asia-india-52063286>

³ <https://www.aljazeera.com/programmes/newsfeed/2020/03/indian-police-force-coronavirus-lockdown-offenders-200330102752863.html>

⁴ <https://www.daijiworld.com/news/newsDisplay.aspx?newsID=699663>

⁵ <https://www.bbc.com/news/world-asia-india-52283748>

⁶ <https://www.theguardian.com/commentisfree/2020/apr/21/kerala-indian-state-flattened-coronavirus-curve>

⁷ <https://blog.independent.org/2020/03/21/coronacrisis-and-leviathan/>

⁸ https://azimpremjiuniversity.edu.in/SitePages/pdf/Azim_Premji_Univ_PSBE_2018.pdf

⁹ <http://www.iosrjournals.org/iosr-jhss/papers/Vol1-issue6/H0164148.pdf?id=5632>

Structural reforms

The coronavirus pandemic has brought to light the need for major structural reforms, be it in our healthcare infrastructure, agriculture supply chain, labour laws or social-welfare policies.

The relief announced by the government in the form of extra grains and pulses under the Public Distribution System cannot be availed by a large number of people who do not have ration cards¹⁰. Another major loophole is that there is no portability in the system, so a migrant worker who is registered in one state cannot avail the same benefits in another. It is difficult to understand why the policy of 'One Nation One Ration'¹¹ hasn't been implemented yet.

The lockdown caused a major disruption in the agriculture sector, which is in the midst of harvesting the rabi crop¹². Supply chains had come to a standstill as mandis (procurement centres) were shut, middle men did not want to buy the produce due to uncertainty over demand, and state borders were closed. However, problems with the agriculture sector are not new. We have been in a constant paradox - with an overstock of food grains, farmers in distress, and millions malnourished and hungry.

What if we had a central agency, with state and district nodes, monitoring and coordinating the logistics of food supply all over India? This could go a long way when tonnes of food gets wasted due to floods and heat waves.

Social infrastructure

As a nation, we have never committed to investing in social infrastructure. Public expenditure on health, as a percentage of GDP has rarely risen over 3% despite the National Education Policies (NEP) of 1968, 1986 and the draft NEP of 2019 recommending spending at least 6% of our GDP on education¹³

Today, we will see the full impact of a poor healthcare system. But low investments in health and education have had consequences for millions of Indians grappling with poverty and unemployment, which we don't feel but ultimately affects the country as a whole.



¹⁰ <https://scroll.in/latest/958786/coronavirus-make-pds-entitlements-universal-to-avoid-starvation-activists-urges-centre>

¹¹ <https://economictimes.indiatimes.com/news/economy/policy/one-nation-one-ration-card-inside-food-ministrys-ambitious-scheme-to-make-ration-cards-portable/articleshow/72089023.cms?from=mdr>

¹² <https://www.thehindubusinessline.com/opinion/lockdown-has-deepened-farm-despair/article31310945.ece>

¹³ <https://www.prsindia.org/report-summaries/draft-national-education-policy-2019>

¹⁴ <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>

We have the largest number of young people in the world today - *investing in the future has never been more critical.*

Sustainable living

Sometimes, this pandemic feels like karma for the way that we have treated our planet - like we are the only ones on it. Despite the Paris Agreement in 2016, nations were not able to aggressively commit to their Nationally Determined Contributions (NDC) to limit the global temperature increase to well below 2 degrees celsius¹⁴. But the last few weeks have shown us that we are capable of taking bold steps, if we want to.

Hopefully, the crisis can have an impact on the way we live our lives in terms of sustainability. People can work from home a few times a week, thereby easing traffic and reducing our carbon footprint, while inducing flexibility.

Post pandemic architecture

I know this is probably not what you were expecting. But for me, post pandemic architecture means designing our world to be more equitable, sustainable and enjoyable - for everyone; where people show kindness, compassion and appreciation not only during a pandemic, but every day; where our schools teach students how to live, rather than how to make a living; where we can live in harmony with all creatures on our planet, and learn to worship nature once again; where success is measured not by GDP, but investments in social-welfare policies and how we treat those around us. This may all sound quite quixotic, like an idealistic dream, but what else is there to aspire for?

Jury Comments

DR. CHRISTOPHER COWELL

Author declared to not be an architect, though her/his mother is. I loved this paper. It is brave, willing to challenge the remit of what "architecture" actually means, thereby offering alternate lines of empowerment. It is well written, coherent, vital on what it considers the essential stakes for India's future, e.g. how we deal with the perceived "least" in our communities, the migrant labourers. It provides a good critical analysis of regional approaches in dealing with the Coronavirus – citing Kerala as an exemplary model (use of drones, police-community cooperation. How do we design trust? What is the shape of reform? One of the few papers to provide citations (extensive footnotes).

AR. MADHAV RAMAN

This essay wins its reader over because of the honesty of the author. Self-admittedly not an architect, the author writes eloquently and analyses bravely outside her domain, drawing architecture into the immediate context of the human vulnerabilities and large scale state action. And yet it is anything but a lay foray, as the analysis is thorough, relying on a wide reading across different news sources to make clear sharp arguments that lie at the core of the crisis.

MS. MEERA K.

A refreshing and honest attempt to reimagine the idea of architecture. The writer brings in the larger pieces of the puzzle, from social infrastructure to sustainability.

Honourable Mention : Dr. Vimala Swamy (Team Lead), Prof. Vidya Srikanth (Team Member)

IIA Number : F-7780, IIA Karnataka Chapter - Bangalore Centre

Topic : POST PANDEMIC ARCHITECTURE: THE NEW FACE OF LIVING

For many weeks we were in denial.... Oh! It's just something happening in a small province in China. Who had heard of Wuhan anyway? People are dropping down like flies, it can't be a virus, there has to be another angle to it. The Western world was pompous in assuming that they were beyond a microscopic virus. In India we went about our business thinking who ever visits Wuhan? COVID 19 just beat all the odds and crept into our lives any which way, and fall we did like a ton of bricks. No other virus outbreak in the past has seen the world come to a standstill in shock and disbelief. And where did we run when we had to be safe? We ran to a shelter that an architect created, a place called home where we locked ourselves in with our loved ones and waited for deliverance. Days turned into weeks, weeks turned into months, the City that buzzed and served us quickly came to a grinding halt.

Confined within the walls of our home, we realise that all is not well with the way we design and live in Cities today. E-commerce platforms have taken over our lives. Buying and ordering everything from a cucumber to an Alexa with a few swipes on the smartphone, we had forgotten our local grocer, the vegetable cart seller who sold what was in season and not bok-choy and watercress. The tailor who stitched your school uniforms who had long closed shop and moved back to the village was forgotten while you ordered your formals through a nameless website. The kitchen that your mother or grandmother cooked in had been replaced by a sparkling modular kitchen with drawers for all the appliances that you bought, but were too busy to use. Dinner was a new Swiggy order every day, packaged in so many layers that found their way to the non-recyclable waste bins. The latest car that you had so lovingly chosen and for which you would pay the equal monthly instalments for a lifetime to come, lay unused two levels down in a basement of your high-rise tower. Material things, that mattered little when all you wanted was to hide from the claws of the virus. All you wanted was a bottle of sanitiser, but even that was hard to come by. You think back then to the times that were, you ponder as there is little else to do.

Hygiene and sanitation were high priority in India in the homes of the past. We took off our footwear at the entrance, washed our hands and feet in the front courtyard, hung up the outside clothes, changed into a dhoti or a home saree and only then went into the kitchen to serve the meal. Even in urban homes where multiple cohabitation had crept in, the chawls of Bombay or the Pols of Ahmedabad had a water source in the

entrance where one could cleanse before entering the threshold of the home. With the fear of COVID, we now run to the washrooms upon entering our home, but to reach it we have to pass through the core of the house, and if you live in a high rise, then you pass through multiple lobbies and lifts before reaching your own home, thereby bringing all the impurities in further proximity.

It took a Pandemic to teach us what we knew since time immemorial.... water cleanses, water heals.

If there is one thing and only one thing in India that is constant in most parts, it is the unrelenting warmth of the Sun. We used it to dry our food for a rainy day, we used it to dry our clothes to a crisp that no virus would dare to dwell on, we used it to strengthen our immunity and bones as we played for hours under the open sky. Today, we continue to celebrate the Sun in our daily lives through prayer and through festivals, but are



Courtyard in a home in Aretipur, Mandya

our homes giving us the joy of experiencing the Sun on our skin? The courtyard, going by several names in Indian vernacular architecture- 'Aangan', 'Ankanam', 'Nadu mutham' was central to the home. All the seasons were experienced in this core be it sunshine, the rain or the cold. Today our homes have a small sliver of the sky in the form of a 4'x10' Balcony. And many times, we even forget we have that as we enclose ourselves in the air-conditioned comfort of our bedroom and pop in the weekly dose of Vitamin D from a sachet. The clothes are washed in a machine and dried in a dryer, because the building rules state that it's 'unsightly' to hang your clothes in that 4'x10' sliver of open sky.



A sunny spot on the terrace of a home in Bukkasagara, Hospet

After days being quarantined in our own homes, we sought that little open space time and again. We stood solemnly and clapped for the COVID warriors, we prayed and lit lamps on the balcony, we sang songs to our neighbours, we watched the sun set as yet another day of virus graphs went by.

It took a Pandemic to teach us that a home is not a home without a place for the Sun, the rain and the sky.

It is but natural to turn to food in times of crisis. The kitchen has become the most used space in the house as the family takes turns cooking, cutting, cleaning and washing. Men have new found appreciation for house work and some others discovered their true talent lay in cooking up simple meals. Eating healthy is the new norm while we shrink back in fear of pre-ordered meals prepared in remote kitchens and cooked by unfamiliar hands. The numerous recipes and appliances that lay unused in forgotten drawers suddenly sing in happiness. The teenagers who you thought only knew to dial in a pizza are learning traditional recipes from a grandparent and discovering the joys of eating together.

It took a Pandemic to teach us that the kitchen is the heart and soul of a home and a family that cooks together, stays together.

We sent our children and youth to places of learning to imbibe knowledge, instil discipline, nurture friendships and gain skills that will make them employable. The pandemic has shown us that the economy can fall in an instant like a pack of cards, and that dream job for which the management graduate was recruited may never see the light of day. We made the medical education out of reach financially to the brightest of minds and realised that we fell woefully short of medical personnel. Given the magnitude of the pandemic, the demand for the doctors, laboratory technicians, paramedics or the nurses can never be met. The construction industry, of which architects are an integral part, has to bring about change. Training and recruiting local labour where possible, providing basic housing and standard living conditions for migrant labourers has to be made mandatory to prevent the reverse migration that was witnessed when the lockdown was announced.



A family prepares for wedding feast at a home in Kandavarayanpatti in Chettinadu, Tamilnadu



A climate sensitive façade improvement to an Engineering college laboratory - Hubballi, Karnataka



Well designed built environments can enrich the learning : open courtyards and deep colonnaded corridors, renovation and redesign of a century old High School in Chennai

Change is inevitable and this pandemic has shown us that change must happen if we are to survive on this earth a little longer. As architects and designers we can make a visible change in the City around us , the schools and universities that our children spend a good part of their youth in, the offices that we spend our most productive years in, the way we commute to work or even the way we live in the special space that we create for ourselves, our Home. Gardening and growing vegetables will see a definite surge on the home front. Homes will have gyms, a space to keep fit or do yoga. Apartment lobbies may have a wash area to sanitise with plenty of natural light and ventilation.

Building activities will never cease, nevertheless it's a good time to introspect and re-think about post pandemic architecture. Can we look at building with indigenous materials that need not be imported and add to the carbon footprint? Do we really need Italian marble, Norwegian timber or that special cladding material from Europe? Can we look at non-airconditioned office spaces and homes, so we

experience our summer, monsoon and winters by adapting our lifestyles? Can architecture education foster a change by sensitising students to build with nature? Can racing technology co-exist with traditional wisdom so we leave a better tomorrow for the future generation?

India has shown the way in many aspects in these difficult times, and as architects let us lead from the front.

Jury Comments

DR. CHRISTOPHER COWELL

This is a well-written essay in the best traditions. A clear, passionate argument. It is perceptive in detail (poignant observation about the incursion of e-commerce and the school tailor gone back to his village; entering a house and practicing ablutions). This is a meditation on the traditional home – it argues as to the importance of the relations between the basics of living (light, ventilation, heat and moisture) and the nurturing of social life. A lovely paper. Middling creativity (perceptivity of small things in life); high context (Indian vernacular architecture); high clarity.

AR. MADHAV RAMAN

At a time when the pandemic continues to be defined by the immediacy of spiking numbers and hope is invested in new technology and quick moving public health administration, this conversationally written essay reaches deeper to seek succour in the timelessness of architecture.

MS. MEERA K.

The essay highlights the role of traditional wisdom. Architects need to understand design presented in a cultural context works much better, in inducing behaviour change.

CATEGORY - B

WINNERS (from 43 Essays)

**“ HUMANITY HAS LEFT THE BUILDING
EVERYONE’S LIVING IN A STEAMPUNK APOCALYPSE**”

**ANNO DOMINI
TIMELINE**

476 MIDDLE AGES 1342 PLAGUE 1600 RENAISSANCE 1800 MACHINE AGE 2020 FUTURE AGE

THE MISERY

In the near future where the world is devastated by a biowar-environmental hazard, where the SURVIVAL OF THE EARTHINGS are put to a testimony -Constant fear of the outside world & survival quest-DARWINISM taken front seat-nature’s selection-In a dystopian world, acheiving an utopian way of securing the land & people,a safe environment,-A DOOMSDAY VAULT. BRING BACK THE FALLEN FEUDALISM where everyone has equal rights & responsibility in securing the land & their survival.

BOUNDARY/HALO

NEEDED A SYMBOLISM & HOPE

THE HALO

ONE SQ MILE
Sheltering approximately 50,000 earthlings within its boundary

PLAN

The transport system for men and goods

THE TOWER

THE PIT
To grow food & save water for the people. Trap sunlight & rain water

THE MANOR
A seat of power and watchtower

HALO CITIES

Transit system to connect the individual cities / other planets

14282

1st Place : Ar. Bhaghyalaxmi Subhas Madapur (Team Lead), Ar. Dhinakaran K. (Team Member)

IIA Number: A - 19340, IIA Karnataka Chapter - Bangalore Centre

THE ARTISAN
THE POD

HEROS WITH HOPE

THE ARTISAN/SERF-RED
Lived in THE POD-cultivated crops-supplied food for all-worshippers of demigods-granted information freedom & equal rights

THE KNIGHT
THE BAND

GALLANT & CHIVALROUS

THE KNIGHTS -BLACK
Stayed at THE BAND - Fearless protectors of the halo-skilled in combat & artillery-Ventured terrains in search of life

THE COUNSELOR
THE COUNCIL

THE STRATEGIST

THE NOBLES -BURGUNDY
Gather at THE COUNCIL - Stategic vision for food supply source & well being of earthlings Believed in the devolution of power-Laid rules for a healthy well being.

THE LORD
THE MANOR

NEVER A GREY OPPRESSOR

THE KING -PURPLE
Ruled from THE MANOR Belived in democracy & coexisting- gave freedom for thoughts-Superior authority over the HALO-Belived in a people centric system

NEOLOGISM
DYSTOPIAN FEUDALISM

EARTHLINGS GUIDE FOR SURVIVAL

BUBBLE WRAP

An automated bubble wraps incase of any enviromental threat

SURVIVAL KIT

Survival kit for the journey in search of earthlings

GREEN

Food cultivation & supply

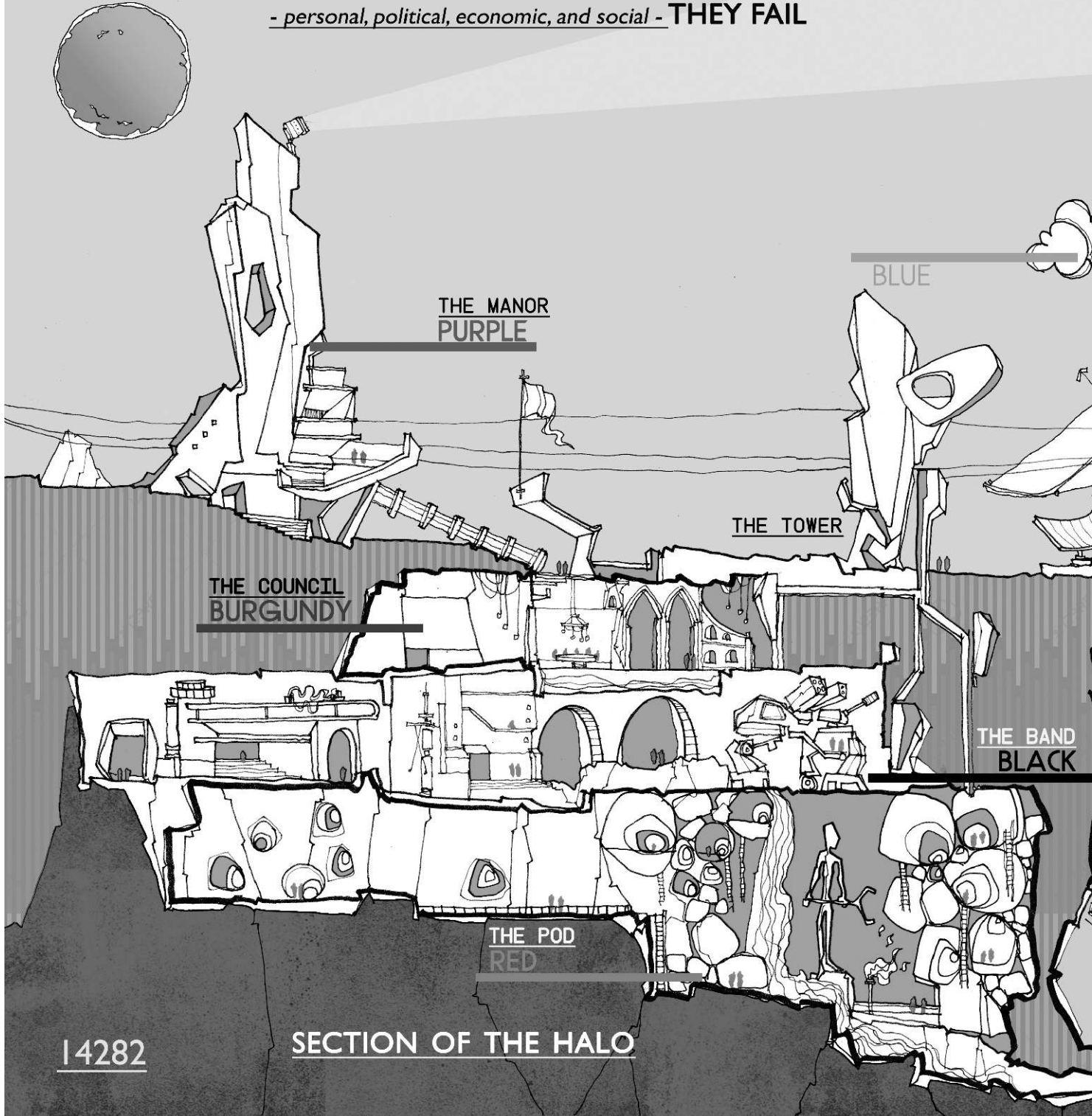
YELLOW

Solar powered energy resources

BLUE

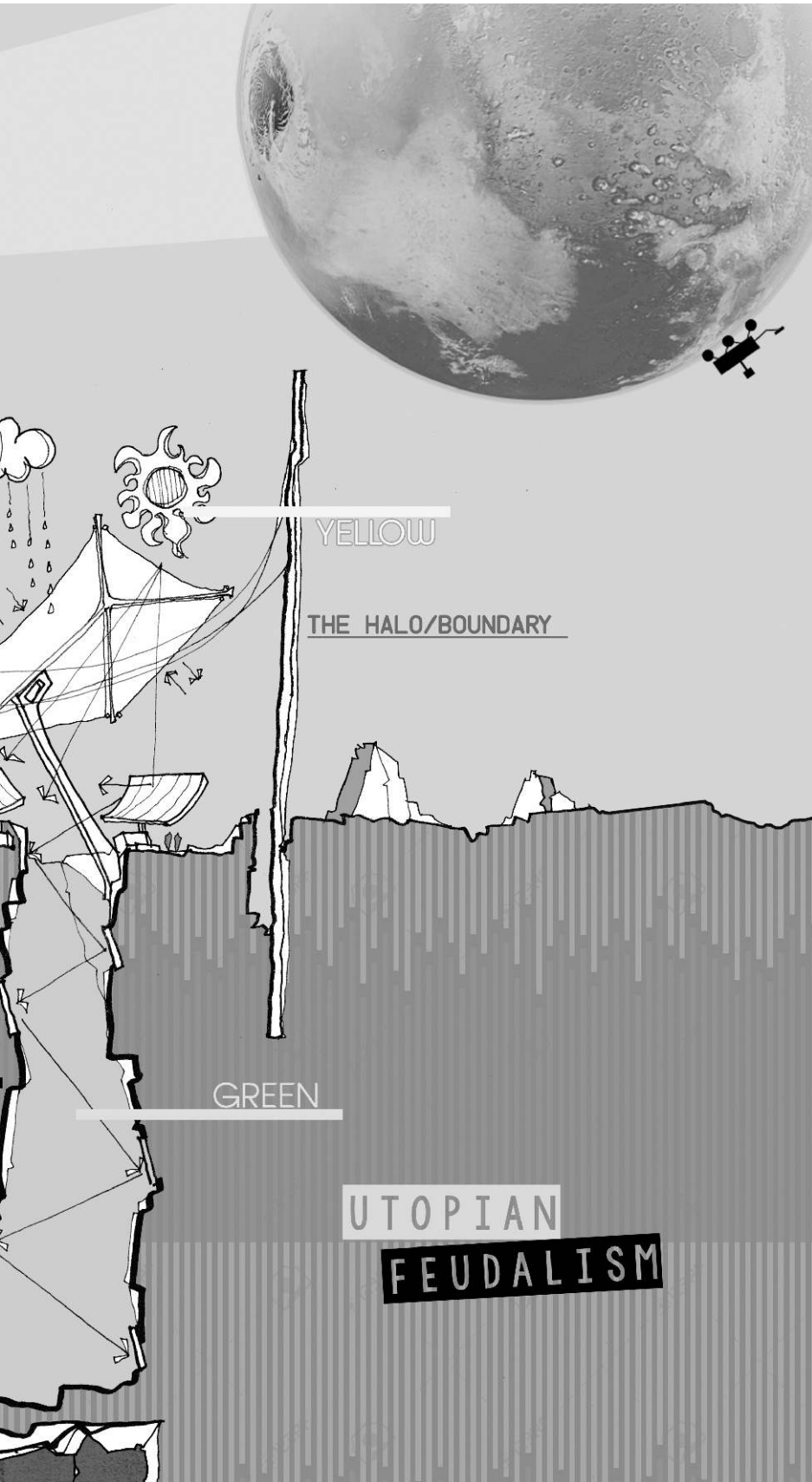
RAIN WATER

UTOPIA - "No place" because when
IMPERFECT HUMANS ATTEMPT PERFECTIBILITY
- personal, political, economic, and social - THEY FAIL



14282

SECTION OF THE HALO



Jury Comments

DR. CHRISTOPHER COWELL

I love the humor of this proposal. It acknowledges the ridiculousness of our present situation and caricatures it as a full-on "Mad Max" future. The characters in this "game" are well-drawn, a sort of bio-war futurist "dystopian feudalism." The automated bubble wraps in case of an environmental threat remind me of the techno-dystopian architecture of the 1960's creating such body architecture as the "cushicle" and the "sualoon." It is an audacious snub to the competition brief, yet in doing so meets the brief's deep-seated anxieties. A fatalist middle finger.

AR. MADHAV RAMAN

Post Pandemic perspectives tend to be rational and positive. Visions of the future tend to reflect an urge return to normal, preferably as close to the way they were or very positively different. This dystopic view of the future was refreshingly and boldly different. Presented in a way where this brilliant flight of fancy lets the mind soar even if the spirit flags. The end result is an exciting narrative to a "what if" scenario that is a deeply telling critique of the human condition.

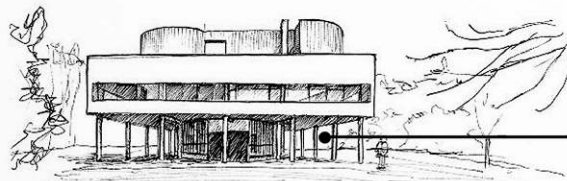
AR. VAMI KOTICHA

Creative depiction, innovative ideas, beautiful sketches & an overall great effort!

2nd Place :

Ar. S. R. Vipin (Team Lead),
 Aneetta Paul K. (Team Member),
 Aaysha Noor M. Ashraf (Team Member),
 Kripa K. (Team Member),
 Wiwin Joseph (Team Member)

IIA Number : A-16600,
 IIA Kerala Chapter - Cochin Centre



VILLA SAVOYE
 BY CORBUSIER
 WAS RAISED ON STILTS IN ORDER
 TO AVOID THE GERMS THAT SPREAD
 THROUGH GROUND

Jury Comments

DR. CHRISTOPHER COWELL

Unlike most of the other entries, this entry exhibits an abundant use of historical precedent. It argues that we can learn from Modernism's tropes of disease prevention - pilotis, top lighting, reduced furniture, white spaces, for example. It explores mitigation through scales of precedent - from Aalto's noiseless wash hand basin, to Corbu's Villa Savoye, and Archigram's walking city. A criticism is that the constellation of ideas does not cohere effectively together around a driving thesis or narrative, nor a more profound set of proposals offered as an outcome.

AR. MADHAV RAMAN

In a communicative poster, the text must not only read but viewed. This poster communicated the dichotomies of the pandemic almost subliminally too with the cold logic of the text juxtaposed against dreaminess of the visuals. The graphic style is light and attractive but encourages the viewer to spend time and view carefully through its detail and their narrative(s).

AR. VAMI KOTICHA

Was able to effectively address a variety of issues at multiple scales with clean & simple drawings.

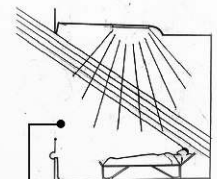
GLOBAL

RESURRECTION OF MODERN ARCHITECTURE

THE ERA OF MODERNISM, WHERE THE SOLUTION TO THE 1920'S FLU, CHOLERA AND TUBERCULOSIS. ARCHITECTS LIKE LE CORBUSIER, ALVAR ALTO - CAREFULLY DESIGNED IDENTIFYING NEEDS, REDUCING THE AMOUNT OF FURNITURE'S ALLOWING DISTINCT AMOUNT OF LIGHT AND AIR INTO SPACES MAKING THEM HABITABLE .

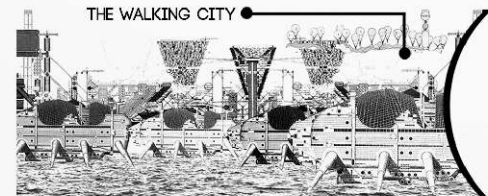
NOISELESS WASHBASIN

ALVAR AALTO'S DESIGN WAS INTENDED TO AVOID WATER SPLASH. AND IS IMPLEMENTED IN PUBLIC WASHROOMS AND HOSPITALS.

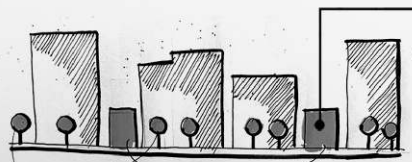


ROOFTOP SUN DECK FOR PATIENTS TO BASK AT PAJMIJO SANATORIUM

ARCHITECTS STARTED DESIGNING "PURPOSEFULLY". FUTURISTIC IDEAS SUCH AS ARCHIGRAMS, WALKING CITY CAME UP DURING THE LAST PANDEMIC TO COMBAT THE UPCOMING THREATS. THESE IDEAS WERE CITIES WHICH WERE SELF SUSTAINING IN EVERY MANNER



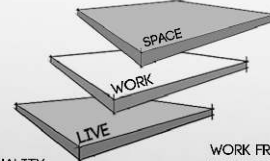
THE WALKING CITY



INTERMEDIATE GREEN PATCHES FOR BETTER ENVIRONMENT

"HOME-SPOTS" NOT HOTSPOTS

COVERTABLE SPACE - PLAY AREAS, VEGETABLE GARDENS, SELF ISOLATION AREAS



QUALITY SPACE FOR THE FAMILY TO MAINTAIN A HEALTHY RELATIONSHIP

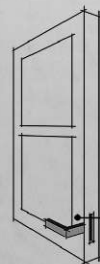
WORK FROM HOME CONCEPT DEMANDS FOR PROPER SPACES IN NEAR FUTURE

HISTORY PROVES AGAIN!

THE PRACTICE OF WASHING HANDS BEFORE ENTERING ANY HOUSE TO BE BROUGHT BACK. BUILT-IN WASH AREAS AT THE ENTRANCE DOORS



HEALTHY GARDEN IMPLEMENTING A RULE THAT ENSURE FOR A PRODUCTIVE GARDEN IN EVERY HOUSE. LET YOUR GREEN SPACES BE MORE BENEFICIAL

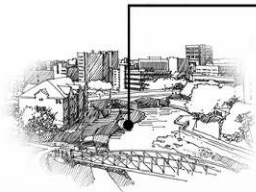
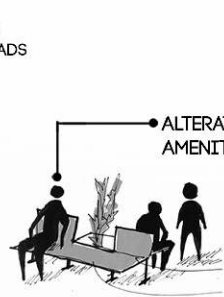


VERTICAL SPACE A RAISED LEVEL WHICH COULD ACT AS A PANTRY SPACE OR A MEZANINE FLOOR WHICH COULD BE A SAFE ZONE DURING A PANDEMIC OR A NATURAL DISASTER

HANDLE TO REPOSITIONING HANDLE TO LOCK THIS MAKING OPERABLE

ARCHITECTURE

POST PANDEMIC ARCHITECTURE

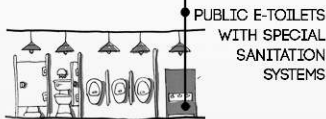


RAPID URBANIZATION ENABLES THE SPREAD OF INFECTIOUS DISEASE, ENSURING THAT THE NUMBER OF PEOPLE LIVING WITHIN A GIVEN SPACE DOES NOT RISE BEYOND A SAFE LEVEL.

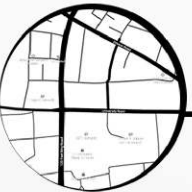
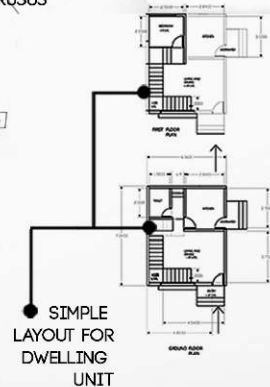
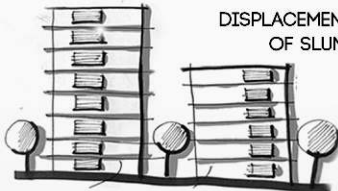
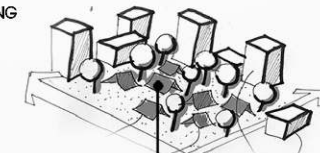
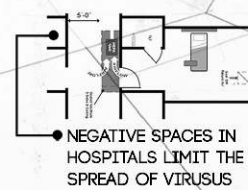
URBAN



OPEN SPACES WITHIN A LOCALITY AT 500M INTERVAL AN OPEN SPACE TO BE PROVIDED WHICH CAN BE USED AS A PARK AND DURING ANY CRISIS THE SAME SPACE CAN BE CONVERTED TO SMALL MEDICAL UNITS OR STORES ETC. THIS CAN REDUCE THE DENSITY OF THE CROWD SINCE IT REPEATS AT INTERVALS



MOBILE TEMPORARY HAND-WASHING STATIONS



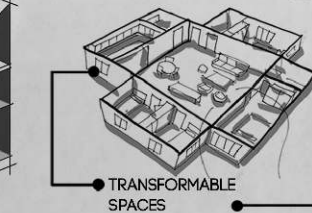
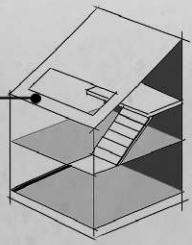
NATURAL ELEMENTS LETTING IN AIR, WATER AND NATURAL LIGHT COMPLIMENT TO REDUCE THE TRAUMA OF CONFINEMENT



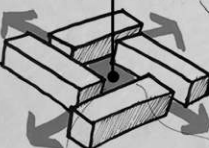
THE IMPLEMENTATION OF PREVENTIVE AND TREATMENT MEASURES AT RESIDENTIAL LEVEL IS FOCUSED ON THE NEED OF COMFORT ZONE IN AN UNCOMFORTABLE SITUATION.

MENTAL AND PHYSICAL HEALTH CAN BE MAINTAINED BY REDESIGNING THE SPACE OCCUPIED BY AN INDIVIDUAL.

RESIDENTIAL



OPEN SPACES OR LIVING AREAS OR BEDSPACES TO BE TRANSFORMED TO WORK SPACES OR PLAY AREAS. MAKE ISOLATION FRUITFUL!



APARTMENT BALCONIES IN THE CURRENT SCENARIO, THESE STACKED STRUCTURES ARE AFFECTED SEVERELY. THE NEED OF A BALCONY OR GREEN SPACE IS REQUIRED TO ENHANCE MENTAL AND PHYSICAL STABILITY

3rd place : Ar. Vilas Avachat (Team Lead), Ar. Gautam Palav (Team Member)

IIA Number : F-07855, IIA Maharashtra Chapter - Mumbai Centre

NEO-AGRARIANISM

A sanguine illustration of Mumbai

Buckminster Fuller developed the term Ephemeralization, which examined the notion that technology will allow us to do "more and more with less and less until eventually, you can do everything with nothing." In our pursuit to maximize our output, we have failed to recognize the real cost of our dreams. Cities cover only 2% of the world's land surface, but at the same time consume over 75% of the earth's material resources¹. The resources which go into making our cities livable do not compare to the negative impact we have on our biome. However gradually it seems more people are displeased with city life. The perpetual traffic gridlocks, high pollution, the steep cost of urban living, and crowded streets contribute to a state of burnout, raising the question—can the rural be urban, and can the urban be rural?

Around 1995, Andrea Branzi defined the phrase weak-urbanization², which explored the hybridization between town and country. Several years have passed since, but the current trend has focused mainly on urbanization. On the contrary, the produce we eat gets grown far away from our urban centers, increasing our dependence on fossil fuels. It is a dire need of time to think post-urban. There is a great deal of potential to evoke an ad-hoc method of development, which is the right mix of urban and rural at the same time. The blurring of urban-rural dichotomy holds the key to ease the negative impact we have on the cities deemed irreparable. Deurbanization should be the way forward, especially in the post-pandemic times.

The graphical illustrations below rethink our established models and make a case to evolve our set development control regulations (DCR), helping future development to cope efficiently with the changing circumstances. For instance, the fire refuge areas in multi-story residential buildings could be turned into sky gardens by adding potted plants. Currently, the refuge areas are calculated as 4% of the upper floor surface index(FSI), thereby reducing the size as we go up. There is a strong case to be made to redefine 'fire refuge' as a refuge area for many other things, like a refuge to quarantine, refuge to unwind, refuge to exercise, and refuge to cultivate, etc. The possibilities are endless. Similarly, the DCR back in 2000's allowed for flower beds, which were 150mm down from slab level— could we introduce something similar or instead make a case for wider and bigger balconies to add biophilia in our built space? Similarly, can we grow enough produce right in our apartments through a hydroponic system?

These speculative scenarios seek to be a conversation starter and help us relook at the DCR with a more pragmatic approach and not merely a means to prevent people from misusing the common space and allocated FSI.

¹ *UN Environment Annual Report 2016.*

² *Branzi, Andrea. "For a Post-Environmentalism : Seven Suggestions for a New Athens Charter and The Weak Metropolis." In Ecological Urbanism, 146–56. Lars Muller Publishers, 2016.*



Jury Comments

DR. CHRISTOPHER COWELL

This entry is beautifully presented, and graphically explained. I was drawn especially to the spaciousness of this entry, unlike the clutter of competing graphics and writing seen with several other submissions. It is a compelling return to the old challenge of moving the rural into the urban. My one wish would have been for the design solution to have matched both the written critique and the graphical presentation. As it is, it remains a well-worn solution.

AR. MADHAV RAMAN

This analysis of a disruptive phenomenon from the structured disciplined lens of Modernism is remarkably lucid. Much like the rationalistic underpinnings of the movement, this poster is admirably organised and uses its real estate very well. While the poster is text heavy, it is skillfully composed to not seem either onerous or vacuous. The clear simple pen and ink style is ideal for this poster.





Image captions

1. Deaconry Bethanien / E2A

Fire refuge areas in multi-story housing could be repurposed as terrace gardens, allowing people to unwind and stretch. Micro-farming can be transported to the terraces, reducing our dependence on fossil fuel and minimizing the urban heat island effect by shading the exposed concrete.

2. The new rural

Through the evolution of technology, work from home for most of the sectors is unquestionably possible. The only issue facing humanity is—are we willing to make a change in our lifestyle and move to the countryside? Here is a glimpse of what our life will be in the rural domain- access to fresh air, an abundance of open areas, and new social interaction norms.

3. Small and Sculpted Studio Apartment / Catseye Bay Design

The phrase 'You are what you eat' can be more appropriate if you have control over what you grow. Hydroponic closet farms and kitchen micro-gardens can sufficiently grow enough produce for our regular consumption, reducing our dependence on shopping for groceries from outside.

4. Flower beds / balconies as quarantine zones?

Can the future balconies be designed to make a makeshift quarantine zone? Temporary panels, mosquito nets, day beds, and adequate ventilation can make the space comfortable.



Revitalization of Art & Craft at Leh (Ladakh), Jammu & Kashmir



Mr. Raxak Dhanani - Email :rakshak66@gmail.com

Mr. Raxak Dhanani is a Student of Architecture, Shantaben Manubhai Patel School of Studies and research in Architecture & Interior Design(SMAID), New Vallabh Vidyanagar.

Ar. Jemish Lathiya - Email : jemishlathiya@gmail.com

Ar. Jemish Lathiya is an Assistant Professor, Shantaben Manubhai Patel School of Studies and Research in Architecture & Interior Design (SMAID), New Vallabh Vidyanagar.



ABSTRACT : A craft is a branch of profession that requires some particular kind of skilled work. In historical sense, particularly as pertinent to the Medieval history and earlier, the term is usually applied towards people occupied in small-scale production of goods. The meaning of craft and its values are ever-changing with development of new techniques and methods. Craft centre is a one-stop craft destination which offers visitors a unique variety of craft-related activities and programmes. It is intended to be a “must visit” tourist destination. In this centre, visitors will learn about Ladakhi handicraft through craft demonstrations & hands-on interactive sessions. Visitors will experience the interactive handicraft making besides viewing the techniques in which they make such fine masterpieces. It also accommodates various trading units. This project intends to provide spaces with forms and functions to foster the development of crafts that Ladakh is known for. The art and craft gallery housed in its premises displays wide collections of handicraft.

Products/artifacts based on time-honoured Ladakhi craft traditions. The core concept of the Craft gallery is education and highlights the craft heritage of Ladakh and local handicraft production technologies.

There are many handicrafts promoting agency in Ladakh. They are private, semi government and government agency with different scope and scale. But they lack adequate space which truly acknowledges the production, promotion and display of crafts. The project has opted for traditional principles in architectural design character of a traditional settlement.

KEYWORDS : Art and Craft of Leh (ladakh), Architecture of Leh, Construction techniques.

1. INTRODUCTION

Art “refers to a diverse variety of human creations, activities, and expressions that are either appealing or attractive to the finer sensor bear some impact to the mind of an individual.” Accordingly, art encompasses a huge range of forms, visual and performing. A craft on the other hand is a skill. Arts and crafts define the cultural layers of particular place, community and race. In fact every corner of the world has certain specialties and typicality, representing the character of the region and its people. India, being a multicultural nation, is home to multiple cultural strata of cultures and traditions the crafts of India are diverse, rich in history and religion.

The craft of each state in India reflect the influence of different empires. Throughout centuries, crafts have been embedded as a culture and tradition within rural communities. In India there is a fusion of art, architecture, craft and culture. every place have their own art and craft which is derived from their living conditions, climate , culture, religion, tradition, and geography. The term craft also refers to the products of artistic production or creation that require a high degree of tacit knowledge, are highly technical, require specialized equipment and/or facilities to produce, involve manual labour a blue-collar work ethic, are accessible to the general public and are constructed from materials with histories that exceed the boundaries of western art history, such as ceramics, glass,

textiles, metal and wood. These products are produced within a specific community of practice and while they differ from the products produced within the communities of art and design, the boundaries of such often overlap resulting in hybrid objects. Additionally, as the interpretation and validation of art is frequently matter of context, an audience may perceive crafted objects as art objects when these objects are viewed within an art context, such as in a museum or in a position of prominence in ones home.

Art and Craft are inter-related in many aspects. They are a form of expression of ideas and solutions through items they create. Different items that craftsmen have made, during their civilization has brought a master piece and stated about the period of their times. India is a country with diversified cultures, art and traditions. It is a colorful country. It is because of these cultures and tradition India is known to the world today. These diversified cultures and traditions are reflected on the art and crafts of the country, which not only specifies the identity but has become one of the most important financial gains of the country. It is a type of work where useful and decorative devices are made completely by hand or by using only simple tools .Usually the term is applied to traditional means of making goods. They are usually labour intensive specialized skills and uses indigenous raw material and resources. According to Handicrafts are generally considered more traditional work, created as a necessary part of daily life, while arts and crafts implies more of a hobby pursuit and demonstration/perfection of a creative technique.

CRAFT ORIGIN

Each art and craft of the ladakh are unique in its own way, and are belong to specific region and made by specific cast of people. Like pashmina wool is available only in changthang, copperwares are famous of chilling village, woodcarving of nubra and pottery of likir. So each art and craft are belong to specific region rom where required climate, material, skills are concentrated in that region.

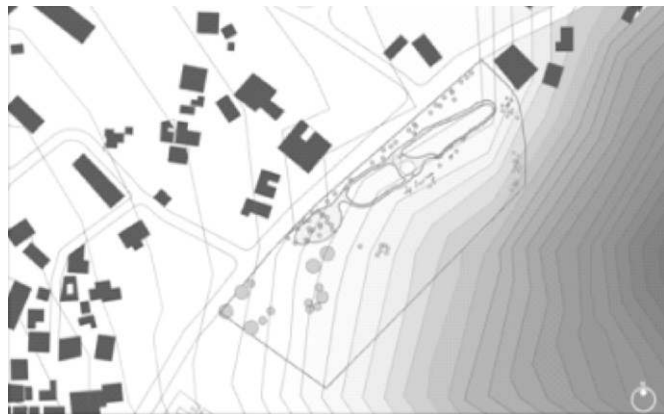


Fig. 1 : Map Showing site, fabric around site and connecting roads

SITE

- Site selected is facilitating at cluster level i.e. catering different craft producing villages at a time.
- The site is located in tourist circuit of Ladakh so that maximum people can visit. It provides market for artisans to sell their products.
- The site is situated near the main city Leh.
- The main bazaar of Leh invites more visitors.
- The Leh palace, Shankar Monastery and Shanti Stupa invites more tourists.
- Leh is the epic-centre of the all art and craft.



Fig. 2 : Contours at site Level



Fig. 3 : Surface Drainage pattern

SITE CONTEXT

- Immediate site context of site is leh palace, main bazaar of leh, sankar gompa.
- Nearby of site is shanti stupa, jamimasjid, Asian art museum, government officials, khadungla pass.

ACCESSIBILITY

- Site is accessible at the south from main bazaar of leh and at the north from shanti stupa and Shankar gompa as well as from the west side also.

CLIMATE

- Leh has a cold desert climate with long, harsh winters from
- October to early march, with minimum temperatures well below freezing for most of the winter.
- The weather in the remaining months is generally fine and warm during the day. Average annual rainfall is only 115 mm.
- The solar radiation is generally intense with a very low percentage of diffuse radiation. Due to high altitude & low humidity, the radiation level is very high.



Fig. 4 : Zoning and 7 mt setback line



Fig. 5 : Site Photographs

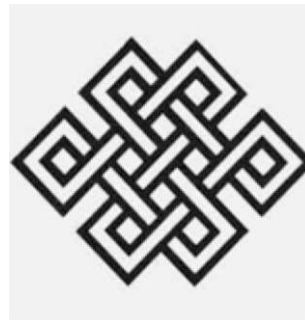


Fig. 6 : Figure showing Endless Knot
Source : [https://commons.wikimedia.org/wiki/File:Faih_Buddhism_Endless_Knot_2_v1.svg](https://commons.wikimedia.org/wiki/File:Fai%20Buddhism_Endless_Knot_2_v1.svg)



Fig. 7 : Evolving plan from centre point
Source : Generated By Author

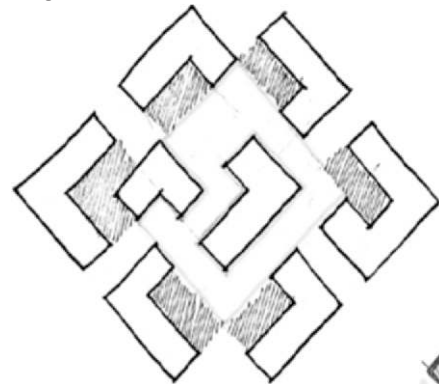


Fig. 8 : Intervening the in-between open spaces

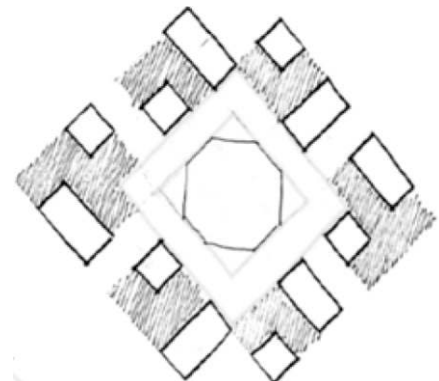


Fig. 9 : Generating plan from centre

CONCEPTUAL IDEAS

Every building evokes a unique architectural experience, a temple portrays spirituality while a house portrays a sense of security and comfort, and a monastery depicts a way of life. People follows Mahayana Buddhism which is influenced from Tibetan Buddhism, Which follows Mahayana schools mainly follows Ashtmangala which having different symbols and meaning which i have tried to imbue in my design of art and craft centre.

Amongst them, the design is hold one of the important symbol which is "Endless knot". It is a symbol of the ultimate unity of everything, as their religion and the influence of the same can be seen in their art and craft and architecture.

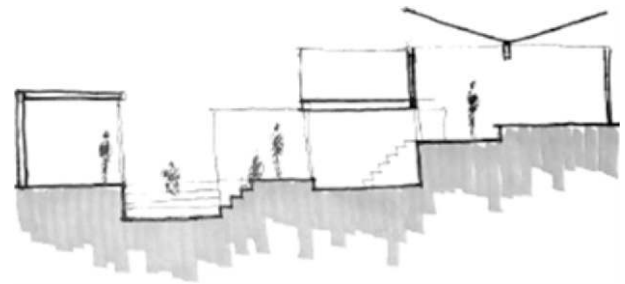


Fig. 12 : Providing butterfly roof for more light and air ventilation



Fig. 10 : Carving the contours and making space usable lower and upper side both

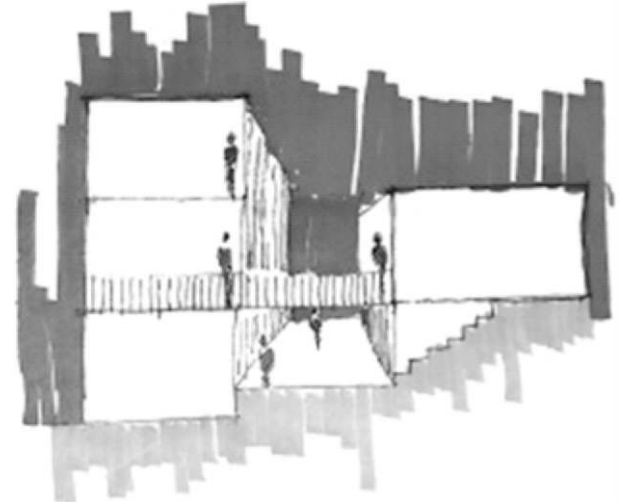


Fig. 13 : Providing bridges at the upper side connecting workshops

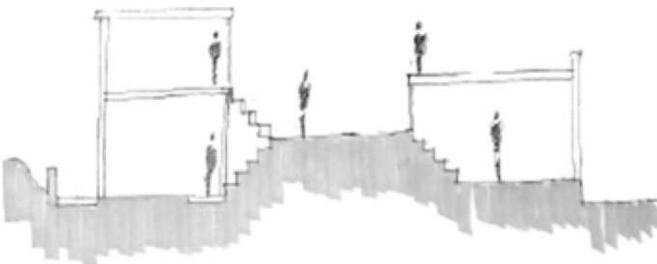


Fig. 11 : Passage connecting buildings to upper and lower side



Fig. 14 : Sketch of centre court space with surrounding buildings



Fig. 15 : Landscape and Terrace plan

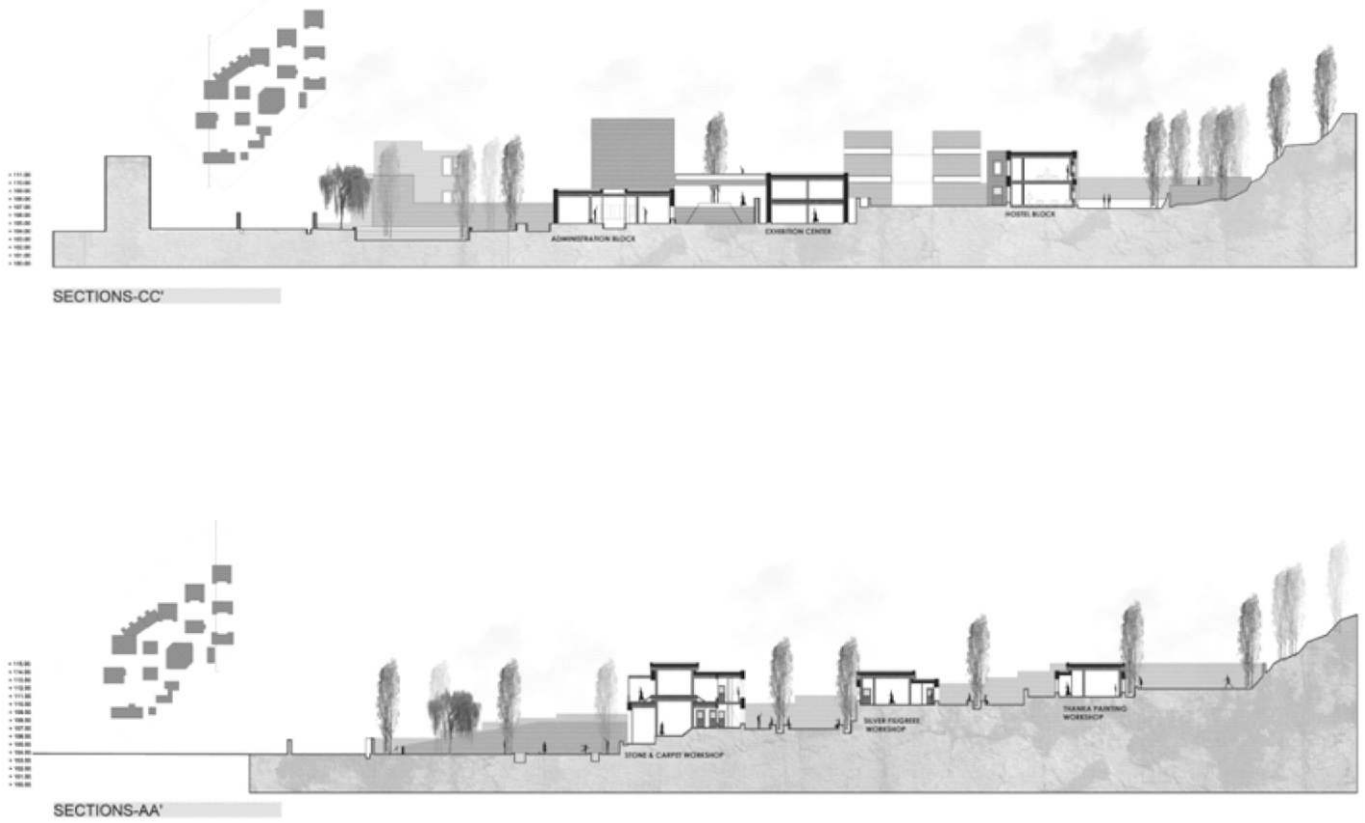


Fig. 16 : Section of Building



Fig. 17 : Second level plan



Fig. 18 : Section of Building



Fig. 19 : Third level of plan

BIBLIOGRAPHY:

1. https://www.researchgate.net/publication/283009715_INDIAN_HANDICRAFT_GLOBALIZATION_IN_CONTEXT_OF_EXPORT
2. <http://www.tibetheritagefund.org/pages/projects/ladakh/leh-old-town.php>
3. http://www.tibetheritagefund.org/media/download/leh05_sml.pdf
4. <https://brage.bibsys.no/xmlui/bitstream/id/188313/Kimura>
5. <http://secmol.org/>
6. https://en.wikipedia.org/wiki/Druk_White_Lotus_School
7. ORGANIZATIONS -The Tibet Heritage Fund
8. The Ladakh Ecological Development and Environmental Group.

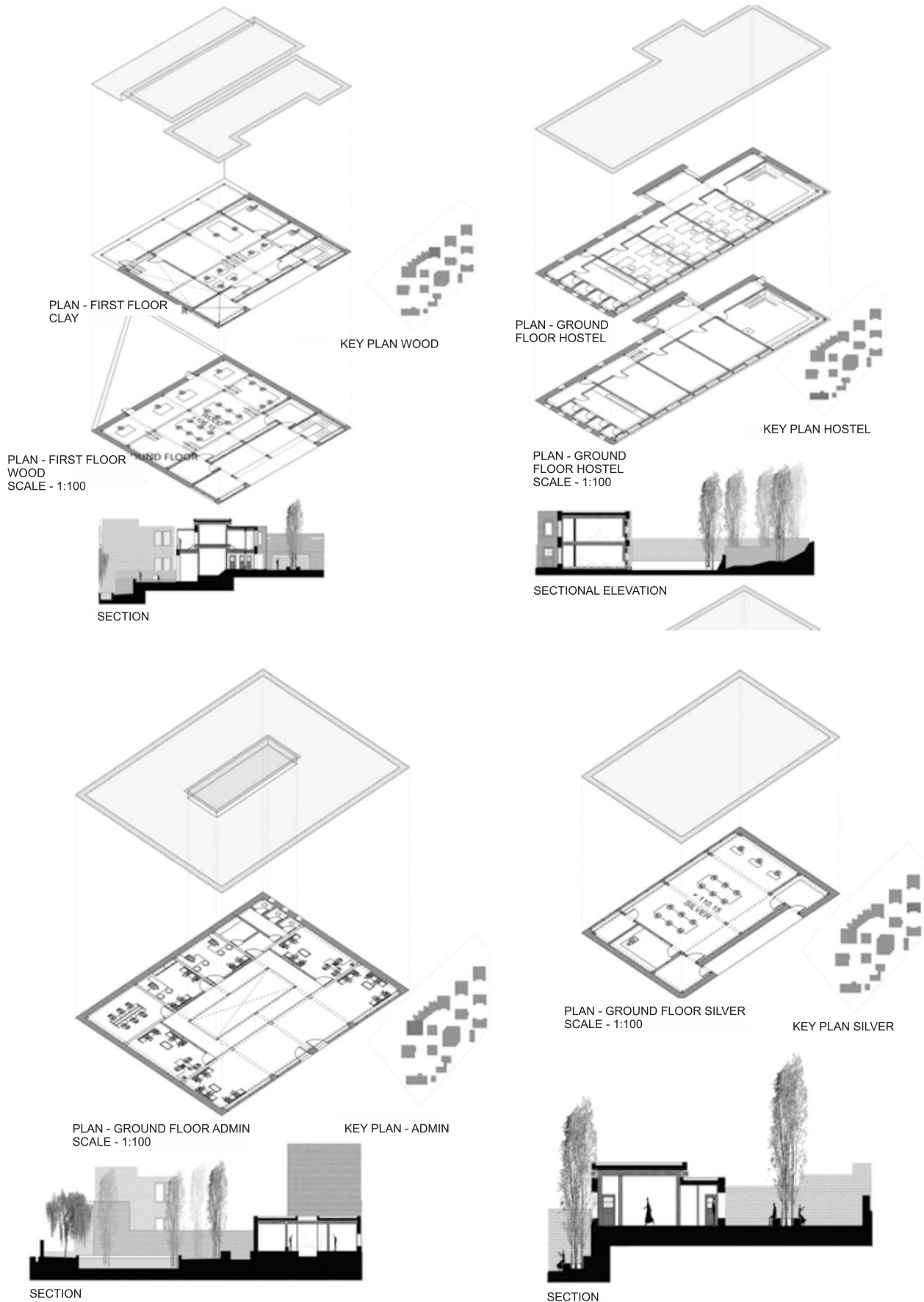


Fig. 20 : Detail layout of workshop

TRADITIONAL LADAKHI MUD ROOF FOR HIGHER THERMAL & ACOUSTIC PERFORMANCE.

ROOF SLAB WITH LEVEL DIFFERENCE TO RECEIVE LIGHT & HEAT TO KEEP THE WORKSHOP WARM.

500MM THICK WALL PREVENT HEAT LOSS FROM THE WORK SPACE.

TIMBER POST & BEAM STRUCTURES INDEPENDENT FROM THE WALL, WITH WOODEN JOIST RESTING ON PRIMARY BEAM

BALCONY FOR THE NORTHERN GARDEN VIEW WHICH ALSO ACT AS OUTDOOR WORKING SPACE FOR THE UPPER FLOOR.

SOUTH ELEVATION IS TREATED WITH DOUBLE GLAZED GLASS WINDOWS, WHICH ACT AS THERMAK WALL TO TRAP HEAT & TO RECEIVE MAXIMUM SUN LIGHT.

LEVEL DIFFERENCES ON BOTH FLOOR DIVIDES THE NATURE OF WORK SPACE IN THE WORKSHOP.

ON LEFT HAND SIDE STAIRCASE FOR UPPER FLOOR ACCESS & ON RIGHT HAND SIDE DOUBLE HEIGHT SPACE FOR SCISSOR LIFT.

NORTHERN FACADE IS ALSO TREATED WELL TO PREVENT HEAT LOSS & GRATER VIEW.

LIGHT PROPERLY COMES IN THE STUDIO AS IT IS SOUTH FACING & ITS DEPTH IS 10 M.

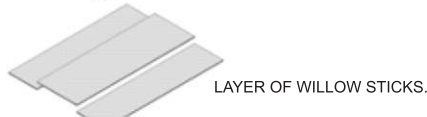
NORTHERN OUTDOOR WORKING SPACE.

GROUND FLOOR WITH DECENDING FLOOR LEVELS GIVES DIFFERENT NATURE OF WORKING SPACE WITH MEZZANINE FLOOR WHICH ACT AS STORAGE OR WORKING SPACE.

AXONOMETRIC VIEW (ART & CRAFT WORKSHOP)



LAYER OF GRASS & MUD MORTAR.



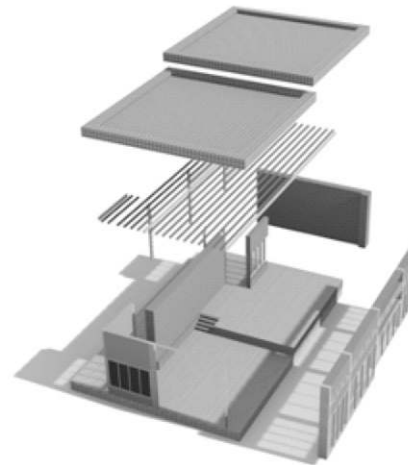
LAYER OF WILLOW STICKS.



WOODEN JOIST (SECONDARY BEAM) RESTING ON PRIMARY BEAM.



WOODEN POST & BEAM STRUCTURE INDEPENDENT FROM THE WALLS.



TRADITIONAL LADAKHI MUD ROOF FOR HIGHER THERMAL & ACOUSTIC PERFORMANCE.

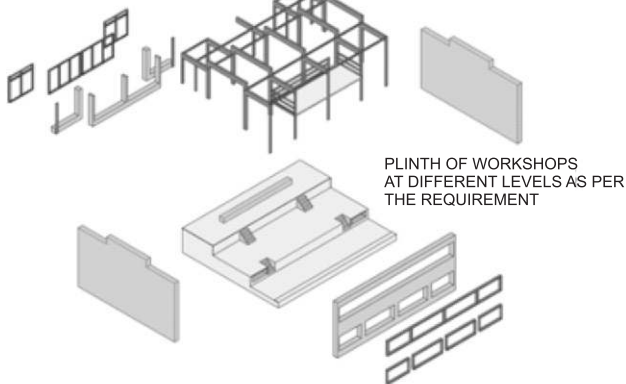
TIMBER POST & BEAM STRUCTURES INDEPENDENT FROM THE WALL, WITH WOODEN JOIST RESTING ON PRIMARY BEAM.

500MM THICK WALL PREVENT HEAT LOSS FROM THE WORK SPACE.

LEVEL DIFFERENCE IN THE WORKSHOP AS PER THE CONTOUR ON THE SITE.

LEVEL DIFFERENCES ON BOTH FLOOR DIVIDES THE NATURE OF WORKSPACE IN THE WORKSHOP.

AXONOMETRIC VIEW (THANKA PAINTING WORKSHOP)



PLINTH OF WORKSHOPS AT DIFFERENT LEVELS AS PER THE REQUIREMENT

AXONOMETRIC VIEW (WORKSHOP)



Fig. 21 : Aerial view of the design through 3d model



Fig. 22 : Elevation of the building units encompassing workshops. Elevation showing the nature of space outside the workshop units



Fig. 23 : Entrance to the institution



Fig. 24 : Canteen space facing and spilling out towards the water body

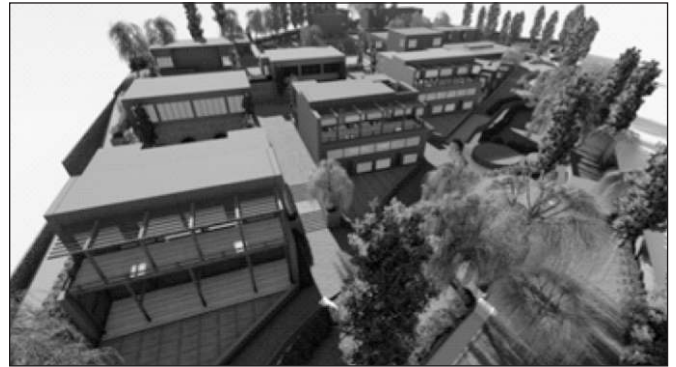


Fig. 25 : Aerial view showing the fenestration of the building units



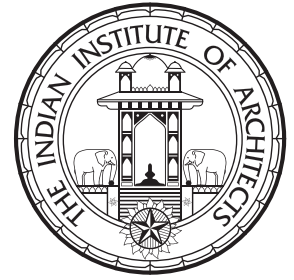
Fig. 26 : Aerial view of the design through 3d model



Fig. 27 : Amphitheatre in the centre to occupy people for events and gatherings amphitheatre that extends to the greens space going up

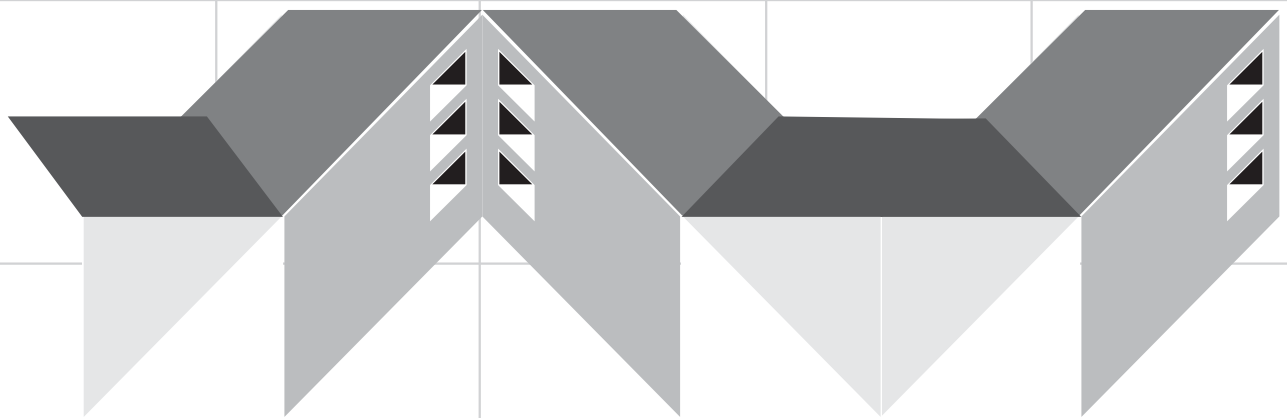


Fig. 28 : Spill out space for the workshops



National Design Competition for students of architecture

Quarantine Facility Design for Temporary Healthcare



The Kaarwan National Design Competition 2020, organized by architectural initiative Kaarwan in association with Indian Institute of Architects, has released its winning projects. The challenge was to design innovative isolation cells in Quarantine Facilities to help subdue the effects of the outbreak on existing infrastructure. Students were also asked to show how their design could help the displaced and detained population in the future.

One of the main reasons for the spread of COVID-19 is the lack of proper infrastructure. Hence, spaces and facilities are needed where isolation of the exposed victim can be carried out since contact tracing is the key to breaking the chain. Hence we must come up with temporary solutions to ensure that suspected victims are isolated in a space that contains

cross-contamination and also takes into consideration the mental health effects of solitary confinement.

The competition aimed at providing implementable solutions that can be adapted as an emergency shelter in the future. Hence, Kaarwan partnered with leading education institutes like School of Planning and Architecture Delhi, Faculty of Architecture and Planning, AKTU Lucknow, Dr Bhanuben Nanavati College of Architecture, Pune, School of Planning and Architecture Bhopal and Lovely Professional University, Punjab.

The competition received proposals from all over India and abroad. The competition aimed at not only starting a conversation on the architecture reality of the new normal but

also to ascertain students were armed with the knowledge to design post-pandemic. Kaarwan partnered with leading architectural colleges across India, to deliver lectures on different aspects of Quarantine Facility Designing. (The lectures can be viewed free of cost on their social media channels - @kaarwan.india) Participants considered many factors while imagining their proposals like future reuse, upcycling construction waste, new materials and building techniques, using shells of outdated transportation, making it low-cost and impact of the location on the project.

Popular industry names such as IA&B Magazine, IIA Journal, ArchitectureLive, Design Detail Magazine, Zingy Homes, DesignWorx Asia also volunteered their contribution to cover this event as Kaarwan's media and publication partners.

These designs were reviewed by the jury comprising of the president of IIA, Ar Divya Kush, Ar Mala Mohan (Retd ADG, Ministry of Defence), Dr Mahua Mukherjee, Head of Centre of Excellence in Disaster Mitigation and Management and Ar Ashutosh Jha, Founder of Kaarwan. The winning proposals were as follows :

WINNER

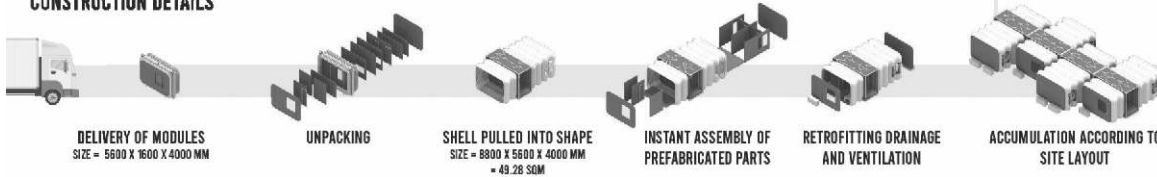
Rishab Denis Rodrick, Khush Anand Gupta and Shrey Gupta - Sushant School of Architecture, Gurugram.

PICHKU ISOLATION CELL

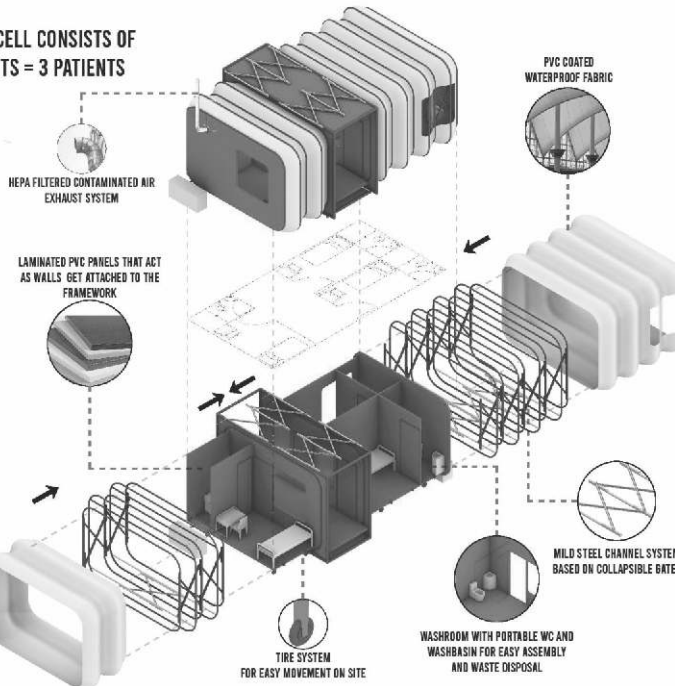
- ✓ COLLAPSIBLE SYSTEM FOR EASY SET UP
- ✓ RAPID DEPLOYMENT AND RELOCATION
- ✓ GREAT DURABILITY AND PERFORMANCE
- ✓ EASY TO TRANSPORT
- ✓ EASY MAINTENANCE
- ✓ LOW COST SETUP
- ✓ SINGLE CELL TYPOLOGY
- ✓ MULTIPLE LAYOUT POSSIBILITIES



CONSTRUCTION DETAILS

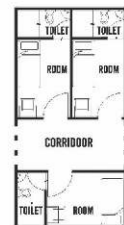


ONE CELL CONSISTS OF 3 UNITS = 3 PATIENTS



KAARWAN NATIONAL DESIGN COMPETITION 2020
KNDC - 343

CELL LAYOUT



MATERIALITY

- PVC COATED WATERPROOF FABRIC FOR SHELL
FUTURISTIC MATERIALS THAT CAN ALSO BE USED IN PLACE OF ETFE -
1. POLY VISCO 410 FABRIC - DEVELOPED IN KANPUR
 2. FABIUS'S FABRIC - DEVELOPED BY IIT DELHI

APPROXIMATE COST OF ONE CELL

PVC FABRIC	55000
WALLS	40000
STEEL FRAMEWORK AND CHANNEL SYSTEM	50000
FURNITURE	18000
SANITATION AND VENTILATION	33000
MISCELLANEOUS	3000
TOTAL APPROX COST PER CELL	209000

READY IN UNDER

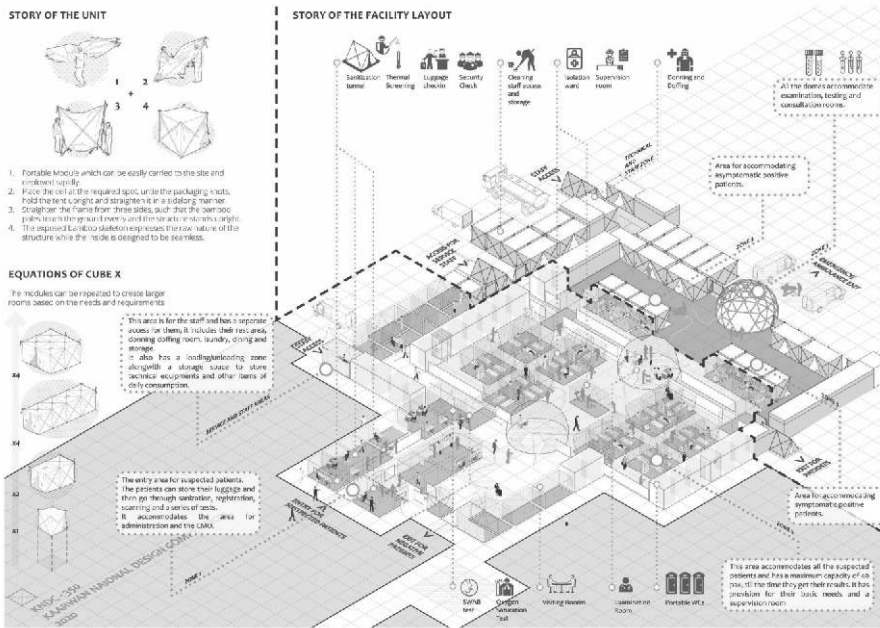


The COVID-19 pandemic impacts the present and uncertain future. The solution must be applicable to both scenarios. The 'Pichku' Quarantine Facility is a prefabricated modular proposal that aims at rapid and dynamic deployment. 'Pichku' suggests the compactness of units which expand into efficient spaces. Contamination via ventilation is dealt through antechambers, safe zones, creation of pressure zones for air circulation and filtered discharge. Sanitation waste is discharged to a septic tank to prevent contamination. Units are provided with a visual connection to the lush green exterior. Materiality makes the structure resilient. Combined with a modular interior, it becomes a typology for low-income habitation.

Design : https://blog.kaarwan.com/kndc-2020-winner-pichku-quarantine-facility-with-innovative-materials-445b043902b2?source=friends_link&sk=918b02adb6bde981936236c8f790cccc

SECOND RUNNER-UP (Shared)

Aditi Bajpai and Dwij Hirpara, Centre of Environment Planning and Technology, Ahmedabad (CEPT)



As we struggle to fight the pandemic, the design proposes a feasible, replicable, adaptive and an ecological solution that holistically addresses the issues of the pandemic while also incorporating precaution and mitigation of the prevailing and forthcoming challenges of SARS-CoV-2.

This temporary quarantine facility comprises a range of deployable structures to provide for the rooms and furniture. Located in the airport complex, it has distinguished access for different users. Spaces are organized in ways that minimize contact between patients and the staff, suspected and the confirmed, nurses and the technical staff — to prevent the spread of the virus.

SPECIAL MENTIONS :

1. Shamita Honawar, Prachi Choudhary, Prachi Deshmukh, - Dr. Bhanuben Nanavati College of Architecture, Pune.
2. Kavya Arounane, Vaishnavi Kini - PES University, Bengaluru.
3. Anushka Dutta, Khushi Gautam, Divisha Vadehra, Ishita Verma - School of Planning and Architecture, Bhopal.
4. Faizan Sharief, Ishita Sharma, Dhritiman Kundu, Pradyuman Ksh - Lovely Professional University, Punjab.

Overall, the design solutions provided by the students can be easily constructed anywhere at a minimal cost. One of the main reasons for the rapidly increasing COVID cases is the poor sanitary conditions, lack of quarantine infrastructure and the space crunch. The proposed designs could address these problems at a regional and national level and help us flatten the curve in the near future.

Kaarwan is now getting in touch with local and government authorities to help them implement these solutions and make the architecture fraternity's contribution in the fight against COVID-19.

This competition was not only an attempt to educate young architects about the changing parameters of Architecture but also to inculcate a sense of ownership and belief that they can make a change by playing their small part. In the words of Dr Vikram Sarabhai, "We do not have the fantasy of competing with the economically advanced nations but we are convinced that if we are to play a meaningful role nationally, and in the community of nations, we must be second to none."



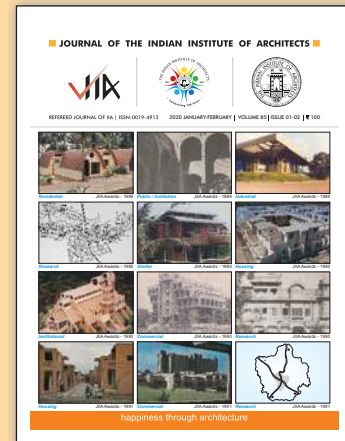
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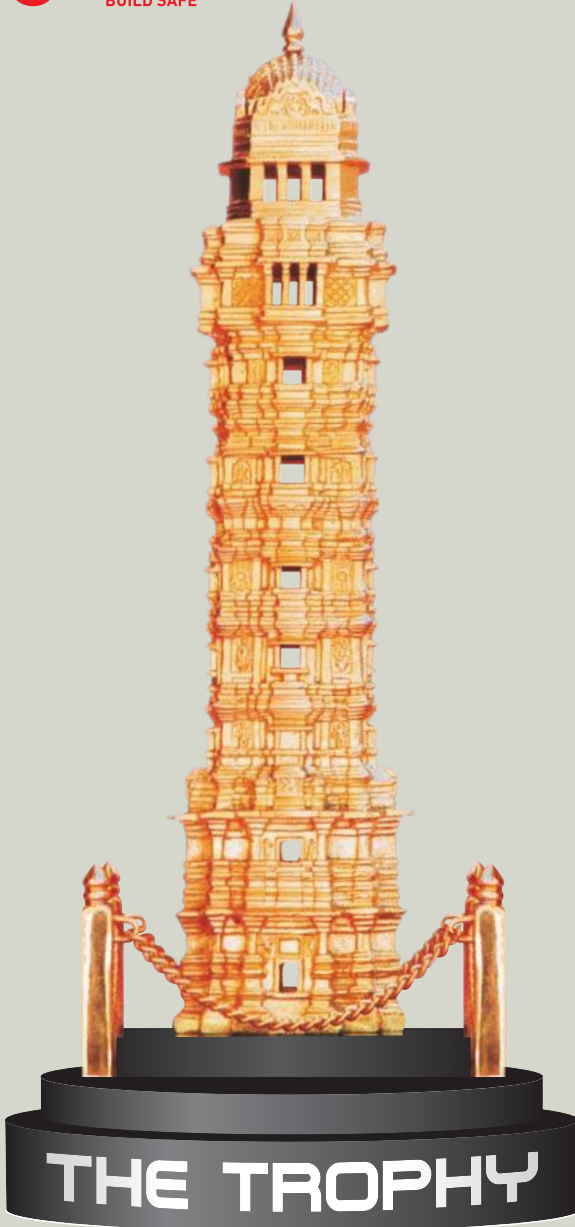
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(Eligible Countries : Bangladesh, Bhutan, Kenya, Maldives,
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