In the Name of Housing

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Abstract

In his 1925 book *Groszstadtbauten*, Ludwig Hilberseimer talks about the relation of city form to that of the smallest single architectural unit; a room within a house. This commentary is validated by the fact that the residential fabric of any city comprises most of that city's built form. For most people, this means the form of housing. This essay focuses on the history of architecture relating to housing in the city of Mumbai. The tie between Mumbai's form and its inhabitation. Looking specifically at the architectural form of these projects, they become instructive both through the breadth of their variations, as well as the depth of their spatial and formal engagements. Building on the history of housing in Mumbai since the early-nineteenth century the essay presents a typology of housing inhabited by ordinary people and their immediate spatial ecologies which facilitate a specific manner of compressed living. These types are commentaries on technology, lifestyle, and culture are all situated within the particularities of their respective time. Nevertheless, these unique armatures still seem to gravitate around certain emergent commonalities that could provide an armature for the design of collective housing models in the future.

Introduction

The alarming deficit of affordable housing in India has received a fair amount of attention in current and preceding government policy. The most recent central government mandate of the Pradhan Mantri Awas Yojna's (PMAY) 'Housing for All' (Ministry of Housing & Urban Poverty Alleviation Government of India, 2015) launched in 2015, targeted building 20 million affordable houses by 31 March 2022.

This impetus was reflected in successive individual state budgets, backed by a slew of fiscal incentives to promote the building of 'affordable' homes. In the state of Maharashtra, where the city of Mumbai is located, the number of homes needed - as anticipated by government - was close to 1.9 million (Zhang, 2016).

In the city of Mumbai, with limited land availability and minimal state-built social housing, burgeoning real estate prices have exacerbated the shortfall of housing for low-income groups. To ameliorate this bottleneck the state government announced the construction of 1.1 million affordable homes over the next four years in the city (Gadgil, 2015). While these policy mandates speak of well-intentioned bureaucratic and political machinery, there is absolutely no detail provided as to what the physical form of this housing is to be. So, despite there being strong government will and frameworks, there is a danger that real estate pressures will eventually subvert the intent of this policy and adversely affect the quality and diversity of life within these projects. While our research into this housing issue has been centred around Mumbai, the challenges are symptomatic of what other Indian, if not all Asian cities face.

This essay attempts to provide a framework to question this approach to housing, where the top-down prescription of policy has in the past resulted in models like the Slum Rehabilitation Authority (SRA). On paper these models offer parity of space for residents but on the ground result in dehumanising and pathetic living conditions, devoid of socio-cultural fabric and a decent living environment. The SRA, using a public-private partnership model with developers, builds free-sale housing to be sold in the open market as well as free SRA housing for slum dwellers. While the built area is proportioned equally between for-sale and free SRA housing, the land division is skewed. In most cases almost 80% of the land is allocated to the for-sale housing and the SRA housing is limited to just 20 % of the site, resulting in 20-storey SRA housing blocks built as little as 3 meters away from each other. Due to the lack of sufficient distance these projects have compromised access to light and ventilation. Hence the SRA housing units within, which the state provides for free to the urban poor, have an adverse impact on the health of their residents.

A 2018 study on three Slum Rehabilitation projects located in the heart of Mumbai city by planners from IIT and members of the NGO 'Doctors for You' reported that 1 in 10 people living in these slum rehabilitation colonies had TB or other respiratory diseases, and that lack of air and light was seen as a cause (Iyer, 2018). The report further implied that the organization of these buildings, that is, their architecture and planning, caused this drastic rise in diseases.

This situation is not unprecedented in the history of Mumbai city, and in many ways, it constitutes the origin story of building laws and the historic built form of the city itself. More than a century ago when Bombay was a burgeoning trading port, thousands of people migrated to the city in search of work. There were no planning and building laws at the time, and people lived in cramped houses in the dense inner-city without sufficient light, ventilation, or sanitation. As a result, when in September 1896 the infamous plague hit Mumbai, it quickly turned into an epidemic; almost 2000 people died every week for a year!

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In response, the then government set up the Bombay City Improvement Trust (BIT) with the specific task of rescuing the city from its derelict condition. To ensure better light and ventilation for citizens, the BIT facilitated two distinct processes: urban renewal which included demolition of the old congested city fabric; and planning new suburban development using building and planning laws.

Fig.1: An example of the courtyard proportions, Bhatia Chawl.

Hence, the first planning laws for Mumbai were designed to create a healthier living environment. They took the form of mandating the 63.5-degree angle. (Fig.1). The rule stipulated that the distance between two buildings facing each other would be such that if a line was drawn from the top of one building to the bottom of the other, the angle would not be more than 63.5 degrees. This rule was designed to ensure that there was sufficient space between buildings to allow for adequate natural light to enter the houses.

This law was applied to all kinds of projects indiscriminately from the privately developed upmarket Dadar-Parsi Colony to the state built industrial worker housing of the Bombay Development Directorate (BDD) chawls.

From 1897 until today, the story has come full circle. We are once again at the point where the architecture of housing needs to be rethought to alleviate the threat of disease and address issues of livability, irrespective of class or income. And for this, we need not look too far.

Researching Historic Housing Types: The case of Mumbai

Following the plague of 1898, through intelligent design and despite the shortage of land and relatively high population density, the city's residents still managed to create living conditions with adequate light, ventilation & social space.

Our housing research through field studies sieved through the historic fabric of Mumbai, excavating some of these forgotten models of housing sutured deep within the city's fabric. We studied these projects through pure metrics, without the lens of nostalgia; comparing them against current models of housing to examine not only how these buildings looked, but also how these buildings worked.

These projects were then compared across metrics of open space, social space, circulation space, built areas and densities. The research focused on documenting the potential of existing and emergent architectural types which were native to our context and presented these to inform new or hybrid models for the design of affordable housing. The research further makes the case for specific spatial housing form to influence the framing of housing policy from the bottom up rather than from the top down as it is currently.

Selection Criteria

The national 'Housing for All' policy defines affordable housing on the metric of unit size; 300 sq.ft (27.87 sq.m) area. This numerical range of unit size was used as the qualifying criteria for the inclusion of most of the projects in the study to highlight and illustrate their relevance and projective capacities. The selected projects were analysed to look for the specific spatial and formal architecture that allows people to effectively inhabit tight interior spaces, which despite being in dense surroundings still had sufficient light and ventilation.

Models of Housing

While there are an incredible number of formal housing types that lie nestled within the city's fabric, we analysed the ones that we considered would have the greatest potential for projective possibilities. The broad typology of housing projects is as follows:

1. Chawls

The Chawls (Fig. 2), a form of early industrial worker housing, built by factory owners or by the state, were intended for labor migrating from their native villages to live and work in city's factories. Most of the chawls studied (except the state-owned BDD Chawls) lie in inner city of South Mumbai and are privately owned. Contrary to the singular image of the chawl as a set of rooms connected through a common corridor around a courtyard, we found many variants within this small geographical area. Many of these Chawls have evolved into family dwellings with spatial modifications to include attached bathrooms and kitchens.

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OPEN SPACE
0 % OF B.U.A

CIRCULATION SPACE
21.7 % OF B.U.A

SERVICES SPACE
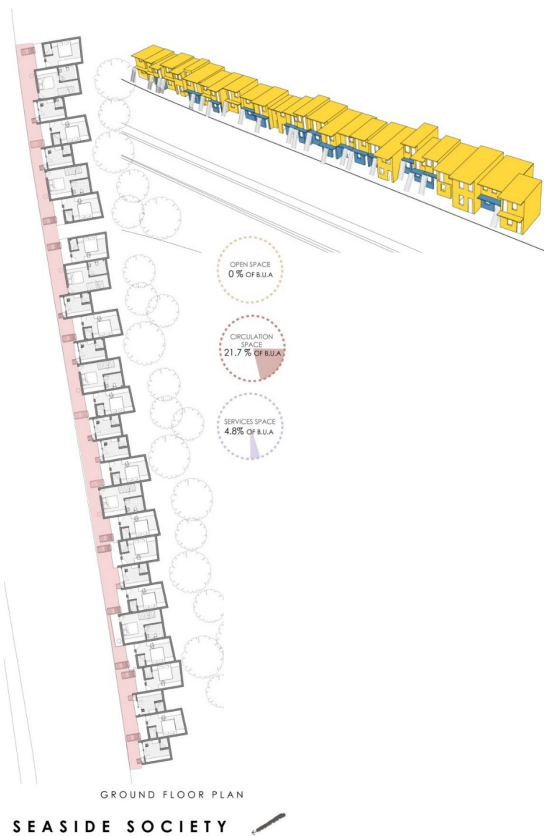4.8% OF B.U.A

GROUND FLOOR PLAN

SEASIDE SOCIETY

Fig.2: Plan showing the carefully articulated architecture of pavement dwellings at Slim City Seaside Society.

2. Pavement Dwellings

These home-grown slim cities, unlike aggregated slums do not enjoy the benefit of being addressed by state housing policies, in situ. They are slivers of mixed-use work-live fabric that inhabit thin interstitial spaces in the formal city closely linked to symbiotic economic networks that bind them to their location. Built out of sheet metal on mild steel or aluminum frames, from a distance these ground-level and single-storey settlements appear ad-hoc and untidy. (Fig. 3) On closer inspection, however, one can observe a finely tuned logic to program adjacencies as well as an expert articulation of the tiniest available open space.

Fig.3: Site & Services Dwellings at Charkop

3. Site and Services

The only Site and Services project studied was the one in the Northern suburb of Charkop built through World Bank Funding in the early 1980's. The reason for its inclusion is that it marks an alternative approach to housing for the poor and is spatially the most impressive of all the state-built projects (Fig. 4a and Fig. 4b). Closest to the high-density low-rise models of slums or urban villages of Mumbai, it displays a distinct character and scale that is fast disappearing in lieu of the singular high-rise format of the city fabric today. The houses clustered around the courtyard treat the courtyard spaces as a common resource valued as an event space; a fact that was ratified through resident interviews. Even four decades later, despite the small dwelling size, the courtyards remain un-encroached, well looked after, and are the lifeline of the settlement.

Fig.4a: Dadar Parsi Colony Source: Phillip Cala

Fig. 4b: BBD Chawl. Source: Sunil Thakkar

4. MHADA projects

Being the statuary body responsible for providing social housing, a project by Maharashtra Housing and Development Authority (MHADA) was also included in the study. MHADA's mandate is to build social housing in equal parts for both 'economically weaker sections' (EWS) & 'low-income groups' (LIG). Recently however, MHADA invited collaborations with landowners and developers to provide EWS & LIG housing, raising questions about the dilution of the state's social housing mandate and the quality control of these built environments. Most of the MHADA projects operate though an approach where, irrespective of location, there is very little formal change in the architectural plan of the unit/building. That said, open space planning is generally generous and well accounted for in these projects. It remains to be seen if the new MHADA model follows the

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route taken by SRA schemes; of compromising the living environment for EWS & LIG housing for free-sale MIG and HIG housing.

5.   SRA Housing

The Slum Rehabilitation Authority (SRA) as described earlier in the essay uses a public-private partnership model with developers building free housing for slum developers in-situ, the cost of which is offset by housing usually for the upper middle class or high-income groups (HIG) to be sold in the open market. While the SRA states that both the free houses and the sale component should have an equal amount of area built, the act however does not make an equal division of the land that these are built on. So, in many cases a greater number of rehoused tenants live on 20% of the land while 80% of the land is reserved for luxury housing in which fewer people stay.   In our research, we examined two extreme variants of housing SRA housing one, a project of intense vertical compression on a limited site with no open space, and the other with a good proportion of built to open space.(Fig. 5)

Fig.5: Well-ventilated covered internal market streets at Swadeshi Market

Housing Dependencies

The study of the above housing types formed the basis of our analysis into the architecture of affordable housing types. The more time we spent in the field looking specifically at the form of these projects, the more instructive they became, both through the breadth of their variations, as well as the depth of their spatial and formal engagements. The analytical diagrams and drawings further galvanised our belief that these armatures, however unique, still seem to gravitate around certain emergent commonalities. Our study lists these characteristics and argues for them to be viewed as essential benchmarks while designing the architecture of low-income affordable housing. A few of these parameters are as follows:

1.   Networks

Global best practices in planning today acknowledge the importance of linkages to transportation networks as housing subsidy. Our study furthers this understanding by bringing to light the interdependencies that these projects share with the city in so far as their design, while influenced by the larger site context, also impacts the surrounding city fabric.

One such project is the Swadeshi Market. (Fig. 6). Programmed like many developments one sees across the city with commercial below and residential above, this project is roughly three quarters of the size of a Manhattan city block. Its market is not at the edge fronting the street creating the traffic snarls so common in Mumbai, but rather, there is a market street that extends through the building, literally connecting you from one part of the city to another. Moreover, the city does not stop at the building but extends through it in well-ventilated covered internal market streets. These streets are used by people as shaded shortcuts through the neighbourhood and hence also end up increasing foot traffic for the shops.

Fig.6: Courtyard proportions at Bhatia Chawl.

Above these streets and shops lie linear residential units, separated by aerial courtyards designed for social interaction. Swadeshi Market and other projects like it are networked within the urban landscape rather than being isolated housing blocks. These projects within various degrees of adjacencies to street networks show how their built forms accommodate linkages to the adjoining urban fabric, allowing for the city to permeate though their private domains. Such systems are not limited to physical connectivity alone but are also part of socio-economic networks as seen in slim city, Seaside Society. Symptomatic of all such settlements, residents of Seaside Society work within proximity of their homes and are enmeshed in various activities servicing the formal city, while also being serviced through its various mechanisms.

2. Social Infrastructure

The importance of social cohesion has been a critical paradigm for the sustenance of these housing types. The role played by elements such as courtyards, corridors, and staircases in the generation of social connect is significant. This condition challenges the assumptions of regulatory frameworks in a city like Mumbai, which are designed to segregate common space from living space in fear of the former being encroached by the latter.

Bhatia Chawl's intimate height to width ratio of the courtyard facilitates communication across its volume,

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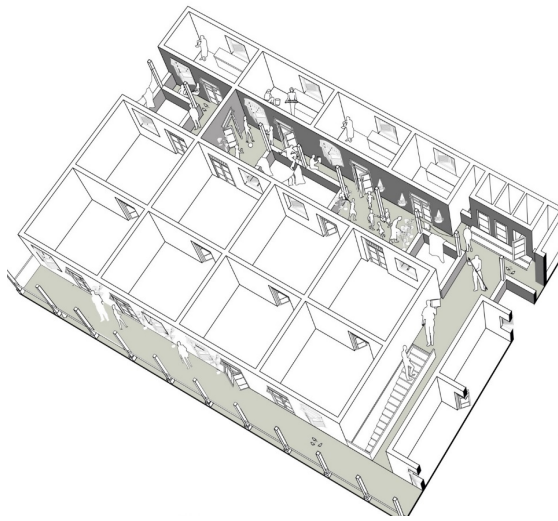
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Fig.7: Atmaram Chawl repeating corridor space

resulting in an extended social fabric that is embedded in the architecture (Fig. 7). Residents of the society here speak with great pride about their housing and how many of them were born and grew up in the building. While they wouldn't mind more area being added to their individual units, they are clear that it cannot be at the expense of the common spaces that they share. In buildings like these you witness first-hand the much-eulogized sense of community. One of the residents told us how despite having arthritis and living on the 4th floor of this walk-up she still preferred living here instead of an apartment building with an elevator because of the sense of bonding and security she feels. She added that if she needs help for anything, not just her immediate neighbour but the entire building comes to her aid. We found this sense of community in other buildings also, the common link being the corridors were a heavily used social space and the x by 2x courtyard proportion creates an intimacy where the courtyard functions like a giant common living room, fostering this sense of community.

This case lies in direct contrast to the SRA project in Lower Parel where corridors, devoid of light and ventilation, are no more than conveyors of people – circulation that offers little potential for community interaction (Fig.8).

2. Open Systems

The idea of a systemic framework instead of a fixed planning logic creates the possibility of an architecture responsive to variation and flexibility. This open system allows for changes in unit size, design and programme responding to a resident's changing needs over time.

In projects such as RK Chawl (Fig.9) the ordering of units is based on a staid repeating grid despite which the system by rearranging the corridor still allows for four units of varying sizes. The architectural planning hence accommodates residents belonging to different socio-economic segments all within the same building without compromising on structural efficiencies.

Fig.8: Corridor space used as common space in RK Chawl Chawl

At the Atmaram Chawl which was modelled on the British bungalow type, with everyone's kitchen separated from each unit's living/bedrooms there is an alternating plan configuration of access corridors and programme. (Fig.10). This tartan grid like plan of public corridor-program-corridor-program has allowed people to modify their units for where the kitchen part of the unit is rented out as a room for paying guests to function independently, creating avenues for expansion or additional revenue for the owners.

Fig.10: UDAAN corridor space as communal space

4. Appropriations & Shared Space

The previous point segues into one of the most pertinent aspects of design of affordable housing, that being the notion of shared space which challenges the traditional binaries of public and private space. It was found for

Fig.9: RK Chawl plan showing variety of unit types

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instance at the RK Chawl (Fig. 11) that people heavily relied on the area in between their houses for use as dining spaces, storage and social spaces, using them almost as extensions of their private interior space.

Fig.11: SRA Housing with intensely compressed space

While internal reconfiguration of space – such as the conversion of the mori (pot wash area) to a bath area or insertion of a loft level – was seen to be the norm in all the projects, the natures of spatial appropriation differed from project to project, contingent on the shared values of the community as in RK Chawl, or because of its absence as seen in the BDD project.

5. Detail

It was instructive to see the sophistication of construction and technical detail within these projects. Indeed, the ingenuity of their construction was pivotal to producing extremely livable spaces. In other words, tight interiors and high densities have given rise to a range of inventive architectural details at every scale, as seen in the louvered stack ventilation of towers of Swadeshi Market Chawl, (Fig.12), sophisticated structural engineering in the cantilevered room additions at the BDD chawls, and tripartite windows for natural cooling at Bhatia Chawl. And at the smallest scale, that of furniture; an indigenously developed collapsible ladder would make even IKEA
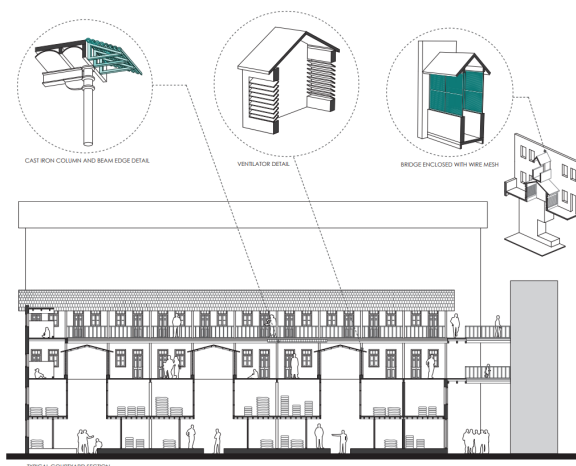

Fig.12: Louvered stack ventilation Towers, Swadeshi

proud. The ladder flat packs against the wall of a thin

corridor allowing one to open it up to access the mezzanine above. Such innovations help position the design of affordable housing projects, not merely as receptacles of people, but as well thought out intricate functional systems at multiple scales that hold clues for the design of housing in today's context.

The Design of Udaan Results

The above five points are but a few of the many paradigms that can inform the design of affordable housing. Throughout this essay we have argued that the design of affordable housing needs to consider among other factors: access to light & ventilation, expandability, systemic openness, live-work scenarios and socio-cultural space. However, what gets built on the ground in the name of housing are largely boxes of concrete that acknowledge little else than the quantum of real estate they enclose.

So, when we were offered an opportunity to design an affordable housing project, we mobilised our research as a basis to inform its design. The project site was in Karjat, on the outskirts of Mumbai city which, while far removed from the geographical and real estate pressures of Mumbai, provided fertile ground for us to test the projective capacity of our learnings in real time and an authentic context. The project called Udaan, though on the outskirts of the city, lay within a 1.5 km radius from a new railway link into Mumbai as well as near the new economic centre of the upcoming Mumbai International Airport. This factor ensured strong links to economic and transportation networks and hence possible access to sources of livelihood for the residents.

The developer's initial brief involved making separate towers for studio units and for one-bedroom apartments. Instead of making this separation, we overlaid the two different units one on top of the other linked together by a common terrace space. This terrace space included different activities such as terrace gardens, children's play areas, and social gathering spaces all integrated into the people's daily movement routines. To this mix we added two more kinds of units. First, a unit on the uppermost floor with greater ceiling heights to add a mezzanine to fulfil the need to expand space for a family; and second, a live-work unit at ground connected to a balcony such that small home industries were possible.

In keeping with the paradigms of the 'Housing For All' policy and to accrue the linked tax benefits, the developer pegged the size of the apartments at 300 sq feet. In our research, we had observed that when people live in small spaces, they depended heavily on the common space outside their houses. We carried this idea forward into the project by designing porous edges between housing units and corridor spaces, with collapsible doors so that the interior functions could potentially spill over into the corridor. The corridor hence mimics a community living room.

Learning from the sophisticated passive ventilation systems in projects like the Swadeshi Market, we designed

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6. ADDED MEZZANINE SPACES ARE SEEN IN MOST TIGHT HOMES ADDED AS THE NEED FOR EXPANSION PERSISTS. THE SLOPING ROOF IS INTENTIONALLY PROVIDED TO CARRY SOLAR CELLS AS WELL AS TO ALLOW FOR MORE HEIGHT FOR A MEZZANINE IF AND WHEN NEEDED.

5. AS SEEN IN CHAWLS IN MUMBAI, THE CORRIDORS ARE NOT ONLY POTENTIAL SOCIAL SPACES BUT ALSO AN EXTENSION OF THE INTERIOR SPACE OF THE HOME, BLURRING THE BINARIES OF PUBLIC AND PRIVATE. WE ACHIEVE THIS BY MAKING THE ENTIRE WALL TOWARDS THE CORRIDOR AS COLLAPSIBLE SLIDING FOLDING DOORS.

1. VENTURI EFFECT VENTILATION SYSTEM ALSO EMPLOYED IN CHAWLS, ALLOWS FOR HOT AIR RISING THROUGH OUR VERTICALLY STAGGERED CORRIDOR SPACE TO ESCAPE OUT FROM LOUVERS IN THE ROOF.

3. REFERENCING THE CHAWL COURTYARD AND THE ABILITY OF ITS PROPORTIONS AND ARCHITEC-TURE TO CREATE A RICH AND VIBRANT SOCIAL FABRIC, OUR CORRIDORS STAGGER IN SECTION CREATING A CONTINUOUS VOID SPACE. THIS ALLOWS FOR VISUAL CONNECTIONS BETWEEN RESIDENTS OF DIFFERENT FLOORS.

2. INGENIOUS DETAILS OF STORAGE AND FLEXIBLE FURNITURE SYSTEMS AS EVIDENT IN MOST TIGHT LIVING SPACES.

SECTIONAL PERSPECTIVE

4. VARIABLE USAGE OF LIVE/WORK UNITS AS SEEN IN MOST HOUSING TYPOLOGIES IS FACILITATED BY VERANDAH EMBEDDED GROUND FLOOR UNITS THAT ALLOW FOR LIVELIHOOD GENERATING PROGRAMS IF NEEDED.
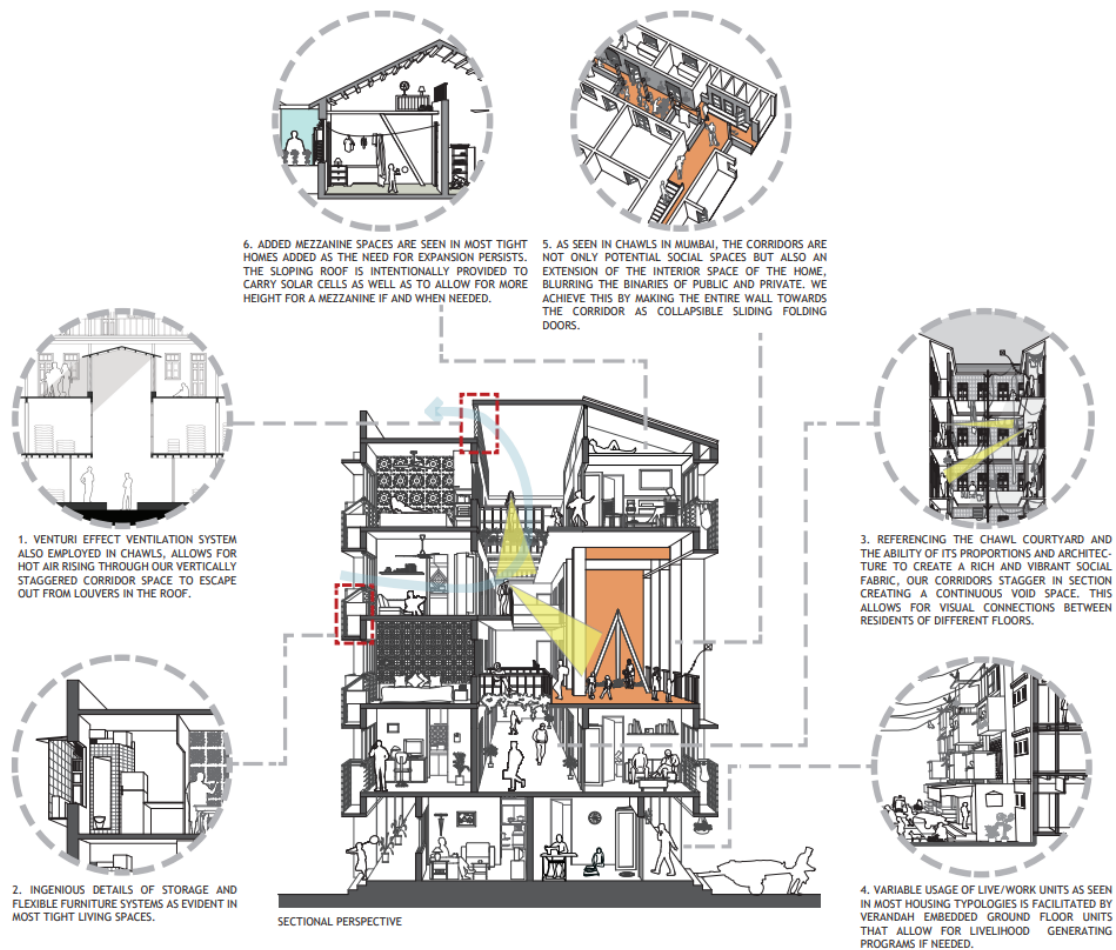
Fig. 13: 'Housing For All' – Cross-section of the building for cross ventilation to ensure comfort in our humid climate

the cross section of the building for cross ventilation to ensure comfort in our humid climate (Fig. 13).

The apartments were designed with two sets of windows to enable the Venturi Effect; one set of windows along the external walls let in cool air, and a second set along the corridor allow hot air to rise and escape through the funnel like lobby through ventilators built into the roof. The inner windows also allow for interaction between residents and create a sense of security across the corridor should they chose to leave their windows open (Fig. 14).

Fig. 14: Inner windows allowing interaction and added security.

Conclusion

The architecture of low-income affordable housing whether state-built or state-enabled developer housing, in most cases lacks imagination and is usually just a mathematical exercise to maximise real estate profits. A recent 30-storey affordable housing project being built for free-sale by a private developer has rooms only big enough to fit a mattress with light and ventilation from a 30-floor high duct of 10 feet in width (Padora, 2019). So, whether it is 300 sq ft apartment in the state built free SRA or a 5-7-million-rupee apartment, we are inhabiting an architecture that is designed to make us sick. So, the question to be asked is this: what enables such architecture? Bad building & planning laws or just bad Architects?

The focus of the planning laws has clearly shifted from the emphasis on quality of life from the early 1900's to quantity of real estate today. With the primary concern of the DP & DCR being to maximize monetary gain, buildings can be taller and closer together irrespective of their access roads, infrastructure, and more importantly the light and ventilation inside these buildings. Through our research and its application in the design of Udaan, we are advocating an urgent need to change the focus of the building code from being purely quantitative (concerned

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only with real estate and its linked profits), to being equally concerned with the quality of life that architecture produces and the health of its residents.

Through our research and this essay, we propose that the way forward is to look back and learn lessons from history; to contextualize some of these ideas that introduced healthy architecture into the DNA of our building & planning codes.

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