



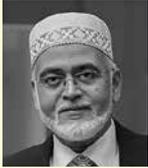
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Ambitious Mumbai Project – Cluster Development for large scale Redevelopment of Urban Habitat



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Mr. Master is spearheading the Bhendi Bazaar redevelopment project, the most ambitious cluster redevelopment project in India. He completed his Graduation (Civil Engineering, 1974) from BITS, Pilani, India and completed his Masters in Civil Engineering with major in Construction Management (1975) from George Tech, Atlanta.

He has an experience of 20 years in USA and now 20 years in India. He has been involved in managing numerous infrastructural, industrial and healthcare projects across geographies. In India he has worked with Wockhardt Ltd, as President of Projects, looking after all pharmaceutical and biotech projects as well as all super-specialty hospital projects.



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Girish, Director at Sterling Engineering Consultancy Services, one of India's most prominent Structural Engineering firms, completed his Graduation (Civil Engineering, 1981) and Post-Graduation (Structural Engineering, 1983) from the Indian Institute of Technology, Mumbai.

In his career spanning 32 years, he has led design teams that have come up with innovative structural designs of a variety of projects. His structural designs bear a mark of innovation and are based on the principles of constructability, sustainability and structural aesthetics. He is responsible for several prestigious high rise buildings and large projects in India.

Girish is also the India representative of CTBUH.

Abstract

Urban decay is plaguing a majority of the world's great cities. These cities, established at the turn of 20th century, have buildings and the accompanying infrastructure constructed over a century ago, which have become obsolete in the era of rapid urbanization. This acts as a deterrent to the growth of the city and hence the nations. Conventional single building redevelopments ignore the necessary infrastructure while substantially increasing the population density in what are already densely populated places.

This paper proposes cluster redevelopment as one of the very few feasible ways of developing the island city of Mumbai in a planned & inclusive manner. The paper does so by studying the case of Bhendi Bazaar Redevelopment Project, which redevelops one of the oldest and most densely populated areas of the city. The project encompasses 250 buildings, 3200 families, 1200 businesses on 16.5 acres of land impacting 20,000 lives.

Keywords: Cluster Development, Mumbai, Social and Cultural upliftment, Sustainability, Urban Infrastructure

History of Mumbai

From a group of seven islands to a strategic port and eventually the financial capital of world's largest democracy – Mumbai has come a long way in the past three hundred years (see Figure 1). The 18th century marked the rapid growth of the city, when hinterland was connected to Mumbai by rail. Subsequently, many construction projects were undertaken to cater to the needs of flourishing markets and economic opportunities. Various business communities such as the Gujaratis, Sindhis, Parsis, Katchis, Dawoodi Bohras and Memons moved to the city from across the country to set up their businesses.

To fuel the engines of commerce, laborers came from across the country. These laborers lived in settlements that grew parallel to the docks, Bhendi Bazaar (the project area) being one of them. The landowners and factory owners constructed rental dormitory-style tenements with common lavatories called 'Chawls' for the laborers and other migrants. Eventually the

Transition of Mumbai



Figure 1. Transition of Mumbai from seven islands into the city that it is today. (Source: Saifee Burhani Upliftment Trust)

immigrants brought their families in these single-room accommodations, drastically increasing the density of the area. During the second world war 'Rent control Act' was introduced which rendered these Chawls unprofitable for landlords. The meager rent acted as a deterrent for the repairs and maintenance of existing Chawls. In 1969, there were about 20,000 Chawls in dilapidated conditions housing two million people (Dua 1990).

Present Day Mumbai, the Economic Growth - the Problem of Housing and Infrastructure

Today, Mumbai is the entertainment, fashion and commercial center of India. It is also one of the world's top 10 centers of commerce in terms of global financial flow. Mumbai accounts for 30% of income tax collections, 60% of customs duty collections, 20% of central excise tax collections, 40% of foreign trade and rupees 40,000 crore (US \$10 billion) in corporate taxes to the Indian economy. Mumbai is the world's 29th largest city by GDP, and with a population of approximately 23 million (Sankhe et al. 2010) people spread over about 600 sq. kms it is the 3rd most densely populated besides being the 8th most populated city in the world. Mumbai's (MMR) GDP is expected to reach 11.9 trillion rupees (\$265 billion) by 2030, larger than GDP of many countries today, including Portugal, Columbia and Malaysia (Sankhe et al. 2010). The population is expected to grow to 33 million by 2030 (Sankhe et al. 2010).

However, this financial success hasn't been inclusive. The old inner-city areas are plagued with century old deteriorating Chawls, narrow roads that make it difficult to walk let alone movement of vehicular traffic, lack of parking and open spaces and access to only common toilets. The deteriorating living conditions have brought the area to a point of socio-economic stand still while the suburbs and other areas are growing rapidly.

However, due to the presence of one of the oldest and most prominent Central Business District (CBD), the majority of the population from the suburbs travel to Island city daily. This area is well-connected through primary roads in both north-south and east-west direction (Project being in the center of this

grid). Public transport services like buses are adequately available with frequency depending on the area (project site has a bus stops at its periphery with buses in every 10 minutes to various location). All three railways, central, western, and harbor lines connect the island city to the rest of Mumbai (Project is within 2 km radius from all the 3 rail routes) (see Figure 2).

The city's economic boom attracts migrants in search of opportunities from across the country. This has led to acute shortage in low-income/mid-income housing; resulting in slums and pavement dwellers. Due to the lack of space most of the new developments are expanding vertically on small plates of land with no consideration for the wider infrastructure. 'Pencil Towers' have cropped up at random, leaving inadequate infrastructure. These unplanned and scattered constructions aggravate the urban blight and add to the burden to an already stressed infrastructure. The governing bodies' lack the resources to undertake large scale redevelopments on their own. The above makes a holistic, sustainable and inclusive urban planning model, the need of the hour.

Cluster Redevelopment

Realizing the need for a more holistic approach to redevelopment the Government of Maharashtra established new regulations in 2009. These norms laid the foundations of Cluster Redevelopment in the city. It incentivized and rewarded cluster redevelopment over individual schemes. Listed below is the detailed comparison of cluster development and individual building development.

Advantages of cluster redevelopment

- Improving quality of life by addition of green spaces, open areas, pedestrian walkways.
- Upgrading & augmentation of infrastructure like roads, footpaths, drainage, etc.
- Incentives to participate for all, i.e. Tenant, Landlord, Developer, etc. Larger the area of cluster, greater the incentive given to the Developer.
- Optimizing energy and resource

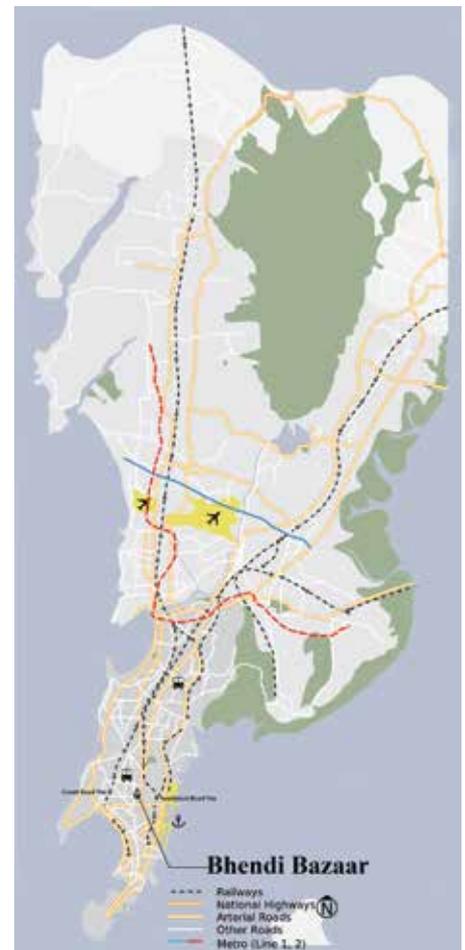


Figure 2. Roads and Railways Connectivity to the Island City of Mumbai. (Source: Saifee Burhani Upliftment Trust)

utilization with use of alternate energy sources

- Waste water management, sewerage treatment plants and solid waste management decrease the impact on existing infrastructure and environment.
- Fast process of city remaking
- Sustainable development in the long run
- Organized development through implementation of city based Master Plan sub-dividing in clusters
- Disadvantage of Cluster Redevelopment:
- Long and capital intensive proposition
- Getting all the stakeholders on board is a major task
- Multi-level approvals from various government bodies

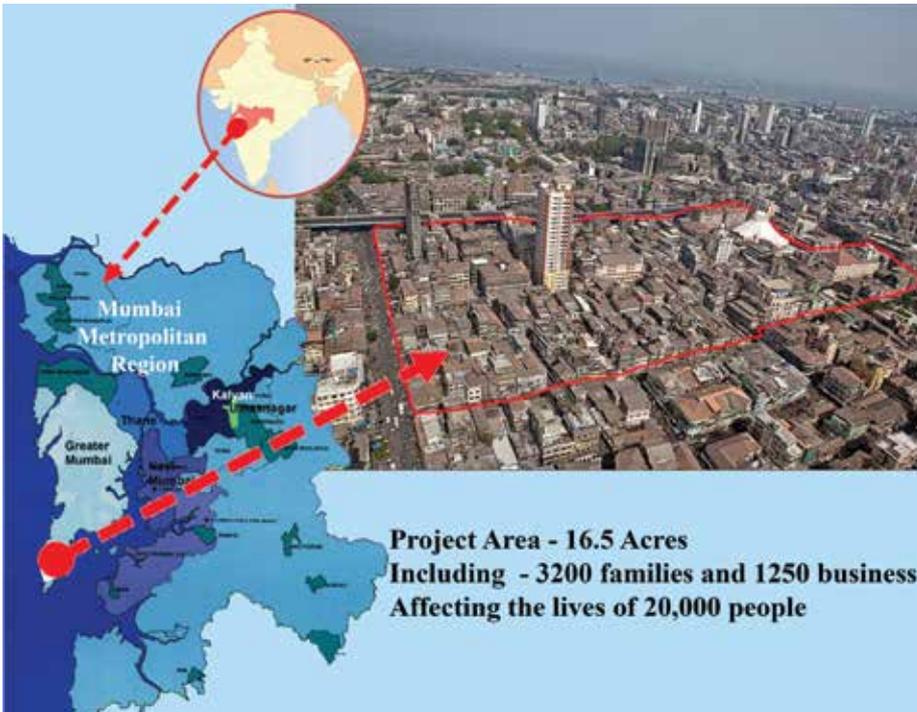


Figure 3. Location of Bhendi Bazaar. (Source: Saifee Burhani Upliftment Trust)

Advantages of tall “Pencil-like” Building Redevelopment

- Turnover time in most cases is lower when compared to cluster redevelopment
- Tenants involved are relatively few in numbers, hence execution is relatively simple.
- Less risk for the Developer
- Relatively easier approval process when compared with Cluster Development

Disadvantages of individual building redevelopment

- More strain on already creaking infrastructure like drainage, roads, water supply, etc.

- Limited/no scope for parking spaces for existing tenants and addition of amenities
- No open areas and green spaces added
- No space for sewage treatment plant, rain water harvesting, etc.
- Narrow congested roads causing traffic snarls and bottle necks
- Unsustainable model of development in the long run
- Only economically feasible buildings get redeveloped
- Prevents holistic development in the future

This approach of Cluster development has added a new dimension to urban renewal projects in the city. The scheme aims to

provide an avenue to profitably develop the dilapidated structures in the old city area which will also add requisite infrastructure while minimizing the impact on the environment. The scheme incorporates various requirements of urban habitat for sustainable growth of the society (see Figure 3).

The Bhendi Bazaar Cluster Redevelopment Project

Bhendi Bazaar

Bhendi Bazaar is one of Mumbai’s oldest areas and lies right in the heart of the old city. It comprises of mostly mixed-use tenanted Chawls, many of which were constructed over 100 years ago. In addition to being home to many families Bhendi Bazaar continues to be one of South Mumbai’s busiest commercial belts (see Figures 4 & 5).

The once beautiful structures of this vibrant area are now at a point of appalling urban decay. For almost a century these Chawls contributed significantly towards the close-knit social life of its residents. The lazy afternoons spent in the common balcony, the gully cricket played in the narrow lanes, late night carom sessions in the central courtyard or below stairways, and exchanging pleasantries and gossip at the morning queue outside common toilets have injected a unique sense of identity to the area. Three generations and more have grown old in these homes - sharing and caring for each other as one big family. The liveliness of the area has still not been lost.

Despite the hustle bustle of the area, it remains one of the most under-developed and neglected areas in the city. The area is serviced by infrastructure that is nearly a hundred years old - built for another time yet still remains today. Essential amenities / infrastructural requirements like car parks,



Figure 4. South view of the project area. (Source: Saifee Burhani Upliftment Trust)

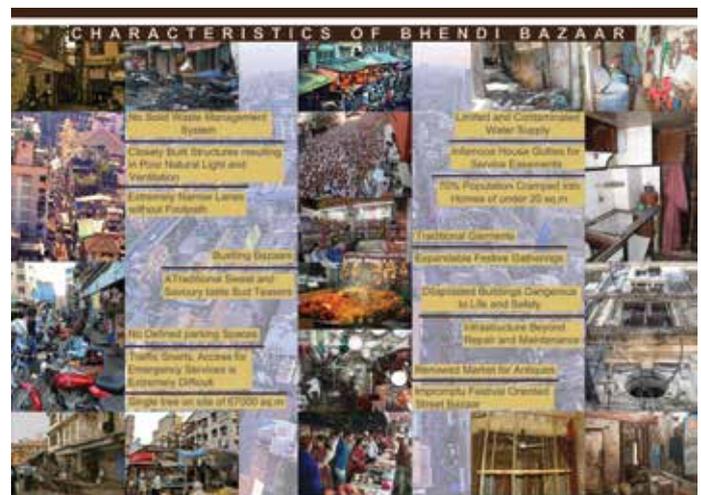


Figure 5. Existing condition of Bhendi Bazaar. (Source: Saifee Burhani Upliftment Trust)



Figure 6. Image of the planned redevelopment. (Source: Saifee Burhani Upliftment Trust)

footpaths or even navigable roads are lacking. Further, it's the outdated system for waste disposal more often poses to be health hazard. Inadequate fire & safety measures leave the population very vulnerable to natural and man-made calamities. Women, children and the elderly find the shared bathrooms extremely inconvenient and at times embarrassing to use. The absence of elevators limits movements of the elderly and disabled. Light and air barely find their way into the tiny units. Living conditions are dire.

Over 80% of the existing buildings have been declared 'Dilapidated and Dangerous' by the authorities. Every monsoon, these buildings get dressed up in blue tarpaulin to face the onslaught of torrential rains which further weaken these structures. A couple of buildings crumble every monsoon and the residents can only hope it's not theirs. The roads are flooded with rainwater and overflowing drainage contributes to the deterioration of health and hygiene of the area indicating the incapacity of the infrastructure to facilitate the lives of its residents. Additionally, traffic snarls have become a daily occurrence, further congesting the area and making it difficult for shoppers, residents and visitors to navigate through the lanes of Bhendi Bazaar.

The Project

Now a large part of the area known as Bhendi Bazaar is being developed under the Cluster development Scheme by Saifee Burhani Upliftment Trust (SBUT). SBUT is a public charitable trust that has been established

specifically for the purpose of undertaking the redevelopment at Bhendi Bazaar. This is a community initiative with the goal being to transform the congested Bhendi Bazaar area into a thriving residential and commercial space for its residents with new infrastructure and civic amenities (see Figure 6).

The Project is the first of its kind cluster redevelopment project and fundamentally changes the way development is looked at in the city. It shifts the focus from merely constructing housing to a more holistic development that aims to fulfill all human needs. The project aims to replace 250 dilapidated buildings housing 3,200 families and 1,250 businesses, old and scant infrastructure with 17 towers and requisite urban amenities on 16.5 acres of land. The precinct is designed using best principles of urban design considering Socio-economic growth, sustainability and cost effectiveness.

The master plan has been designed to create more commercial opportunities while uplifting the quality of life of the residents. This vision for the new era of Bhendi Bazaar will be achieved through building efficient infrastructure with modern amenities and wide roads, promoting sustainable living and creation of green open spaces. The project will aim to be a model for future smart cities with endeavor towards intelligent parking management, traffic control, digital signage, automated waste disposal, connected living, etc. Basic needs such as accessibility for people with special needs are lacking in most parts of Mumbai and are even ignored by many new developments. The project puts



Figure 7. Rooftop plan of the project. (Source: Saifee Burhani Upliftment Trust)

people who require special assistance at the heart of planning, and endeavors to cater to all their needs (see Figure 7).

The creation of new infrastructure and availability of technology at their disposal will infuse growth and open new avenues for the businesses in the area. The redevelopment endeavor will attract new businesses and investment, increasing employment and contributing to the socio-economic growth of its residents. The rejuvenation of Bhendi Bazaar will also encompass the celebration of heritage – Fatimid architecture, latticework and domes are set to add a distinct aesthetic to the neighborhood. It aims to uplift the lives of the people through sustainable development.

Social Growth – Benefits to the residential tenants and the community

Individual growth & development: The redevelopment endeavor will provide its residents with homes and contemporary living conditions which will cater to their daily needs. Even the smallest configuration will be a self-contained 1 BHK home with two separate bathrooms. While currently more than seventy percent of the tenants occupy an area of less than 300 sq. ft. in old dilapidated structures with common toilets, the redeveloped apartments will have a minimum area of 350 sq. ft. The homes have been designed to maximize natural light and ventilation. Buildings will have vertical transportation systems and podium level recreational spaces.

- Facilities to be provided to Residential Tenants (see Figure 8):



Figure 8. Layout of minimum 350 sq.ft. future residential unit. (Source: Saifee Burhani Upliftment Trust)

- Ownership of houses
- Safe and secure neighborhood
- Designated parking and elevators facilities
- Well planned garbage handling & disposal system
- Elegantly designed landscape and outdoor lighting
- Community areas and recreational facilities

Societal growth and enhanced Public Realm

The Master planning is done with the intention to preserve the cultural fabric of the area. Open spaces, recreational areas, central walkways

and community halls to encourage public interactions. Additionally, the surrounding of all the religious structures will be augmented to promote growth of the community.

Design essentials draw from Fatimid Architecture to maintain the area's rich cultural heritage. Arches, intricate lattice work and domes will further help retain the heritage and historical significance.

At the heart of the project, Raudat Tahera is a memorial mausoleum and holds a significant religious importance to the Dawoodi Bohra community. Made out of marble, this majestic structure attracts Dawoodi Bohras from all over the world to pay respect to their late spiritual leaders. Raudat Tahera

constitutes an important part of India's varied architectural legacies. It holds a unique place of honor amongst all the Islamic monuments in the world as the entire Al-Quran is inscribed in gold and bejeweled with precious stones on the inner walls of the mausoleum (see Figure 9).

Facilitating the Transition of Residential Tenants

Since the buildings were already declared dilapidated and dangerous for human habitation, well planned transit facilities were built and maintained for the safety of the tenants. However, to further ease the stress of transition and to gain the trust of the tenants, the Trust provided the tenants with added facilities such as movers and packers, washing machine, and necessary furniture such as cupboard, bed and free utility supply (water and electricity). Further, regular interaction programs and workshops for all the tenants were held to facilitate the transition. These facilities also minimize the impact on daily lives of the tenants during the construction phase.

The transit facility provides them with a clean, safe and secure living environment. In addition to providing basic housing it also provides parking, recreational & communal spaces, elevators and dedicated facility management services. It adds elements of sustainable living such as solar panels, sewage water treatment, offering a glimpse into the future of Bhendi Bazaar. The transit gives the residents a first-hand experience of residing in a modern-day living atmosphere, making the transition to the future Bhendi Bazaar smoother (see Figure 10).

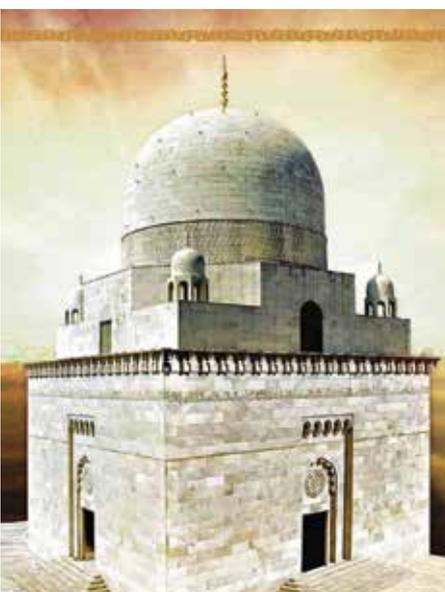


Figure 9. Raudat Tahera the mausoleum sacred to Dawoodi Bohra in Bhendi Bazaar. (Source: Saifee Burhani Upliftment Trust)



Figure 10. Facilities at residential transit constructed especially for the project. (Source: Saifee Burhani Upliftment Trust)

Economic Growth – Benefits to commercial Tenants and Economy

At every stage of planning, inputs from various stakeholders, ranging from residential as well as commercial tenants to expert consultants, have shaped the master plan and design of the project. To secure commercial success for businesses in Bhendi Bazaar, the project will create a distinct high street shopping environment to attract new customers to the area. The makeover of Bhendi Bazaar will generate more employment opportunities and result in wider socio-economic benefits for the people in the area and beyond. The infused infrastructure and new age information technology will aid growth and open new avenues for the businesses in the area.

Facilities to be provided to Commercial Tenants

- Street facing shops
- Ownership of Commercial establishment
- Separate loading-unloading facility
- Easy access to shops through elevators, escalators and stairways
- Security through surveillance cameras
- Fire alarm and water sprinkler
- Provisions of washrooms, prayer rooms and crèches (see Figure 11)

Facilitating the Transition of Commercial Tenants

The Trust has built a first-of-its-kind Commercial Transit, which serves as a model for change from an unorganized chaotic market place into a well-planned modern shopping destination. It aims to not only facilitate the businesses during the construction phase, but also helps them adapt to the contemporary street shopping environment of the future Bhendi Bazaar.

The commercial transit has been provided with escalators and elevators for easy movement of customers and goods, wide entrances providing high street shopping experience, safe business environment with fire alarm, surveillance cameras and sprinkler network, provision of washroom & prayer room for convenience and comfort of the tenants and shoppers equally (see Figure 12).

Sustainable Development

The project is planned to promote sustainable way of living. The project is pre-certified to Gold rating by IGBC (Indian Green Building Council) Indian



Figure 11. Planned commercial redevelopment. (Source: Saifee Burhani Upliftment Trust)

equivalent of LEED. Each of the nine sub-clusters will be self-sustained backed with modern technology and e-friendly practices. Through this the project tries to establish a blue print for the future smart cities in India. In this era of globalization, high speed fiber-optic infrastructure will not only allow the inhabitants to pursue trade opportunities on a global level but also allow exchange of knowledge and information with people across the world. In addition to this, the following measures will make the project sustainable:

- Each sub-cluster (i.e. group of buildings) will have separate sewage treatment plants aggregating to 3,700 CUM/Day capacity. The plant will recycle 100% of the sewage generated and use the recycled water for flushing and gardening purposes. Apart from saving water, this will reduce the load on the

municipal sewage system. It is anticipated that these plants along with the rain water harvesting system will result in not requiring any additional water from city in spite of increase in density

- Solar-powered lights will be used in streets and public areas like staircases in order to reduce electricity consumption. Reducing the future energy requirement by 5%.
- Energy efficient lights (LEDs, T5, etc.) will be installed and is expected to save a minimum of 40% energy as compared to conventional fittings.
- The project will have a waste management mechanism at the locality level. 8 to 10 tons of wet waste will be processed daily to produce compost and manure for vegetation and gardening. The project is considering the



Figure 12. Commercial transit constructed especially for the project. (Source: Saifee Burhani Upliftment Trust)

implementation of underground vacuum waste collection systems. Internationally recognized revolutionary waste collection processes will be integrated into the infrastructure.

The project also aims to have intelligent parking and traffic management systems that will save time and fuel. 3,000 parking spaces are planned in accordance to the building by-laws and vehicles would be appropriately routed to locations where parking is available.

Additionally, building orientation with gradually increasing building height ensures ample natural light and sea breeze for its residents. Significantly more space will be available with the addition of open areas, green spaces, play and recreational areas. Wide roads will replace the narrow and congested lanes to accommodate tree lined footpaths that will allow for the smooth flow of human and vehicular traffic. This will considerably reduce fuel consumption and carbon footprint. Best principles for traffic management have also been incorporated in the design (see Figure 13).

Process of Cluster Redevelopment and Governance in Mumbai

Cluster redevelopment regulations in Mumbai are still in its infancy. The regulations around cluster redevelopment came into being in 2009 and despite making modifications to the regulations since then the authorities are already working to change the regulations and encourage participation.

Bhendi Bazaar project being the first of its kind under the new regulations, there is an onus on the Trust to amass the knowledge that it gathers along the way and share this with the authorities to better frame the regulations in a manner that works for the betterment of the city.

As per the current regulations as well as the norms, the procedure for carrying out a cluster development project involves the following:

- Purchase / development rights of existing buildings
- Enter into agreements with tenants providing them security
- Move the tenants to transit

- Clearing of space to enable construction
- Construction of rehab buildings
- Bringing back of tenants
- While the construction of rehab buildings is being undertaken, simultaneously construct incentive apartments and the necessary infrastructure
- Marketing and sales of the incentive areas

Business Model and Status

The Trust has so far borne all the costs through the loans and charitable donations from other community Trusts and members. With an estimated budget of approx. 4,000 crore rupees approximately (\$650 million) to undertake the project, the Trust has made significant strides. It has acquired more than 80% of buildings and has consents from more than 75% of tenants in the area. The plans have been fine-tuned and are ready for execution with most key permissions already in place, and awaiting the final few clearances from the government.

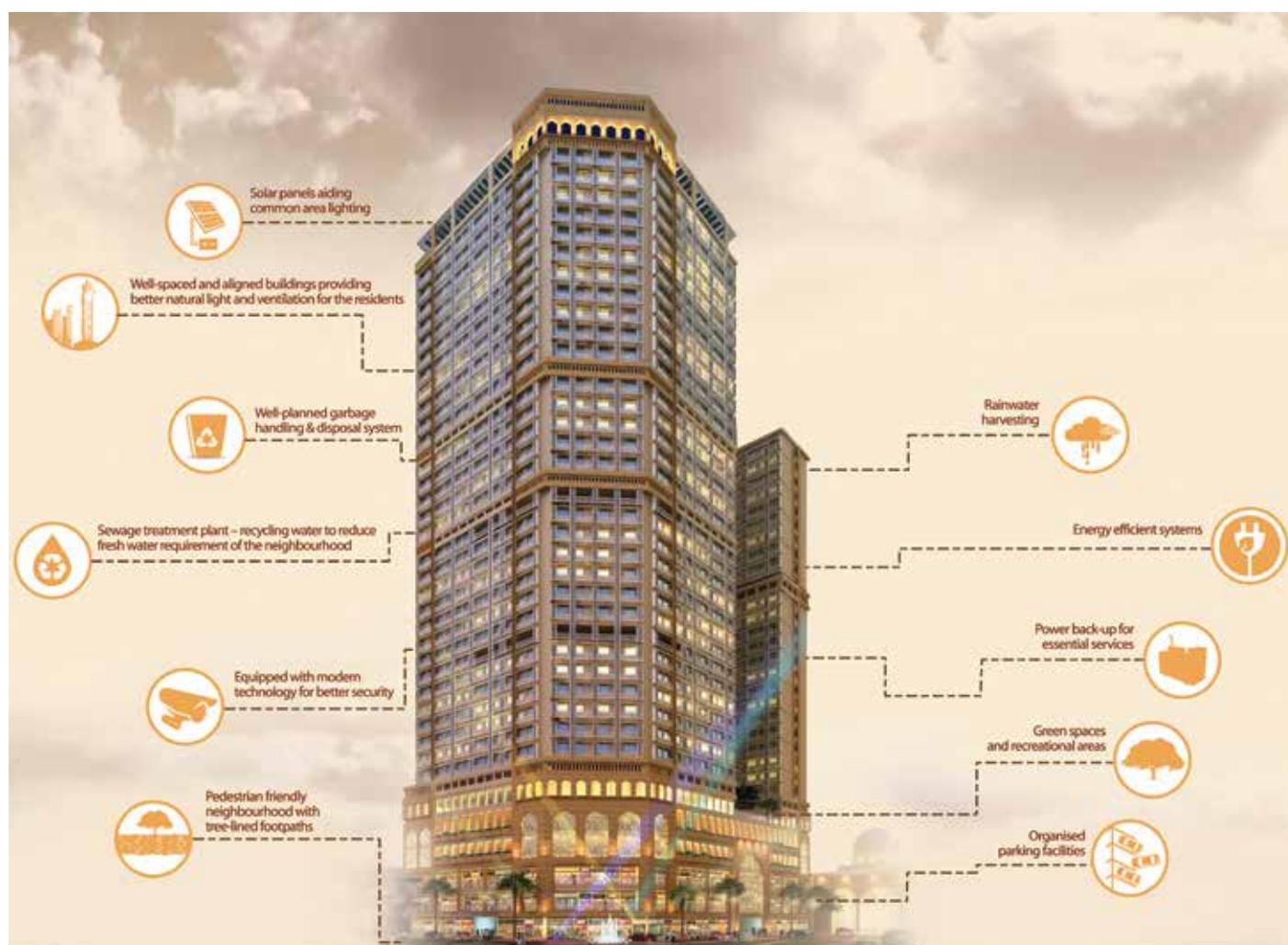


Figure 13. Some of the features that emphasize the sustainability aspect of the project. (Source: Saifee Burhani Upliftment Trust)

While approx. 80% of the land area would be used to rehab existing tenants the Trust would try to recoup its expenses by creating 3 sale towers, on the remaining 20% of the land area, the apartments in which sale towers will be sold at market rates. To summarize:

The key cost components are:

- Building Acquisition Costs
- Tenant Management Costs (Commercial and Residential Transits – Construction and Maintenance)
- Rehab and Sales Towers Construction Cost
- Statutory and Liaising Cost

The most crucial activities are:

- Tenant management and ensuring tenant satisfaction
- Statutory approvals
- Construction

Revenue Streams are:

- Sales of residential units in sales towers
- Sales of commercial units in sales towers

Appointment of Developer

Expert developer with significant experience and track record will be appointed to undertake the redevelopment in the most efficient manner. On appointment of the developer a Special Purpose Vehicle (SPV) shall be formed with the developer. The SPV shall be responsible for:

- The construction of the rehabilitation as well as the sales towers and the requisite infrastructure as per the construction schedules
- For raising finance and incurring all costs
- Overall project and construction management

All the costs of the developer as well as the building acquisition and tenant management costs borne by SBUT shall be recovered from the proceeds of the sales tower.

Conclusion

Rapid urbanization across the globe has compelled the urban planners to consider more sustainable model of development. The urban habitats in addition to supplying the ever increasing demand for housing,

infrastructure and employment opportunities is also bound to provide an inclusive environment which nurtures holistic growth of individuals and society.

Cluster development scheme enables the redesigning of the old city areas to incorporate best practices of urban design and help in sustainable growth of the cities. The government is working to establish favorable policies that aid and expedite cluster redevelopment; particularly in the area of tenant eviction, building owner cooperation and expeditious approvals from governmental agencies.

Cluster development scheme acts as a bridge between rapid urbanization and sustainable growth while gracefully introducing the old city areas to smart cities and connected urban living – creating a new path for growth.

With the Government of India emphasizing on urban rejuvenation, the Bhendi Bazaar redevelopment project has been selected as a model for development of all old inner city areas in India.

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