

Rehabilitation of One of the Asia's Largest Slum: Dharavi, Mumbai, India

Ar. Shritik Srivastava,

MURP, Faculty Of Architecture & Planning, Dr. A.P.J. Abdul Kalam Technical University, Lucknow

Submitted: 05-02-2022

Revised: 18-02-2022

Accepted: 20-02-2022

ABSTRACT: Mumbai is the financial capital of India but 52.5% of Mumbai's population live in slums and all of them crammed in just 9% of city's total geographical area, Dharavi is one of them. Dharavi is not just a slum but also a thriving Micro-industry. It has an area of 2.165 sq. km. and houses approximately 700,000 to 10,00,000 people. It is one of the highly populated areas in the world. Dharavi provides shelter to those who reach Mumbai with a dream to be successful but they don't have enough money for their survival. Dharavi provides shelter at the centre of the city while connecting all parts of Mumbai through local trains. Thus Dharavi is becoming a hell for day to day habitation.

This paper proposes a solution to fight the aforesaid problems of the community and present a proper rehabilitation of slum dwellers with architectural, social and economic solutions.

KEYWORDS: Slum, Rehabilitation, Slum redevelopment, Dharavi, Proposed redevelopment drawings, Slum upgradation

I. INTRODUCTION

After being independent in 1947, India was recognised as socialist republic. It means it was the responsibility of the government to promote social welfare projects including affordable social housing.

But in the year of liberalization (1991), the government dumped the responsibility and the law and moved on to facilitating the private sectors, thereby encouraging the private sectors to work for their own profit and money making strategies, as a result they make housing for rich people who shower them with money instead of better affordable housing for the unprivileged, and this was a major disaster.

We live in times of harsh economic inequality because of failed political and financial systems. It is very common that the higher class take services from lower class people but when they ask for shelters in return there is no proper answer. Thus a type of area comes into existence, slowly and

steadily in the neighbourhoods where the opportunity of employment is more which is known as Slum.

If you look at the map of the Mumbai, you find clusters of informal settlements officially called slum across the city. According to census 2011, 52.5% of Mumbai's population lives in slum and all of them crammed in to just 9% of city's total geographical area.¹ Around 95% of households in Mumbai cannot afford to buy a house in the formal sectors.² It is also a reason for slum formation in Mumbai.

So what is the reason that every second resident of India's financial capital lives in a slum?

The reason is simple-because there is no formal affordable housing in the city. Now, the question is why?

This is simply because the cost of land is going to be a factor in the cost of housing. In Mumbai land is very expensive.

The average cost per square foot land in Mumbai is 21000 rupees and the average per capita income is 2.5 lakh/year. At this rate a 500 square foot house is worth more than a crore.³ Consequently, it is clear why Mumbai has slums.

Dharavi is not just a slum but a thriving micro industry.⁴ It has an area of 2.165 sq. km. and houses approximately 700,000 to 10,00,000 people.⁵ It is one of the highly populated areas in the world. Total annual turnover has been estimated at over US\$ 1 billion (approx. 500 crores INR), which plays an important role in Mumbai's economy. Dharavi has an active easy-going and unregistered economy with numerous household enterprises and small scale industries employing a large section of slum residents; leather, textile & pottery products are among the goods made inside Dharavi. Nearly 80% of Dharavi's population is self-employed in Dharavi itself.

While residents run lucrative businesses within the slums, they still continue to live in very small makeshift houses due to unaffordable rental prices in Mumbai. Rental prices can be as high as

INR. 25,000 per month for a one-bedroom apartment in localities close to Dharavi, compared to INR. 5,000 per month rental for a 100 square feet hutment in Dharavi. The land on which it sits has an estimated value of over \$1.3 billion due to its prime location at the intersection of two major railway lines and proximity to Mumbai's central business district. So why the locality which should be known as multi productive area, known as a slum?

In fast growing cities, slum is a common problem. This paper tries to propose a solution to fight this major problem of the community and advocate proper rehabilitation of slum dwellers with architectural, social and economic solutions. Rehabilitation that is done till now is not a proper

rehabilitation in my opinion. It was just the conversion of horizontal slum to vertical slum. But this paper will propose the rehabilitation based on occupation of Dharavi people because only shelters cannot feed the people. The best rehabilitation is the one which helps the rehabilitated people to work and provides job satisfaction to them. For example: in a slum area where a family earns from milk production and cattle rearing is allotted shelter unit only at second or third floor of a tower after rehabilitation, then where will their cattle live and how will they manage to feed their family. Hence, the best rehabilitation scheme is the rehabilitation based on occupation.



Figure 1 Map showing location of Dharavi, Source: Contested Urbanism in Dharavi

a. SLUM

The Census of India defines slum as an area unfit for human occupancy because of dilapidated buildings, overcrowding, faulty arrangement and design of buildings, faulty arrangement of streets, lack of ventilation, light or sanitation facilities or any other combination of these factors.⁶

b. WHAT IS SLUM REHABILITATION?

Basically slum rehabilitation is the process in which "slum dwellers are relocated in better affordable houses." Slum is developed due to the lack of affordable housing in fastest growing cities. There's an analogy that Shirish B Patel (Urban Planer) once used while writing in the economic and political weekly. He stated that-A big ship, with many workers who do various kinds of jobs on board, they can work on ship the whole day for which they would get paid. But in the evening, they can't stay on the ship, but spent the whole night in the sea water and if they survive getting not eaten by sharks they will have to report to work in the morning at 8:00 a.m.

And if they do not then there were many others in line, who would do the job for even less salary.⁷

c. SLUM AT GLOBAL LEVEL

About 29.762% of world's urban population, which constitutes around 1 billion people are currently living in slums.⁸ It is estimated that if the current trend continues then numbers of

dwellers will rise to 2 billion by 2030 and 3 Billion by 2050.

Urban population has seen a dramatic growth in the last century. However, this growth has not been uniform and growth rate of slum population living in developing countries is much higher than those living in developed countries; the data shows that the rate of growth of urban slum population in developing countries is about 2% per annum where as in developed countries, it is about 0.5%.⁹ Given the challenge of absorbing future population growth, this difference is expected to continue with the most of developing countries.

Mass urbanization is a big concern for developing countries as they lack in infrastructure and basic amenities such as water, sanitation and healthcare required to absorb the increasing number of people. This has led to a steep rise of slums in many developing countries with inadequate resources and also are facing problems on various other fronts such as health, education, political and social exclusion.

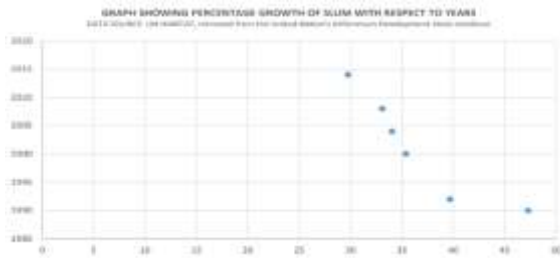


Figure 2 Graph showing global slum growth,
Source: Author, Data: UN HABITAT, Goals database

d. SLUM AT NATIONAL LEVEL

Growth of slums in urban India is a direct result of growth of unemployment, urbanization and the lack of affordable housing. Slums can be seen in all the cities, big metropolitan or small ones, old or new and unplanned or planned. 22.5% of the population, which is about 65.5 million, lived in slums scattered over 2613 towns/cities, stated in a 2011 report.¹⁰ Slum towns in Indian states and union territories are not equally distributed. More than 81% of entire slum population and 1955 slum towns were registered in just 9 largest states of India namely; Tamil Nadu, Madhya Pradesh, Uttar Pradesh, Karnataka, Maharashtra, Andhra Pradesh, West Bengal, Rajasthan and Gujarat. Whereas 9 smallest states in India namely; Goa, Nagaland, Sikkim, Pondicherry, Meghalaya, Arunachal Pradesh, Mizoram, Chandigarh and Andaman & Nicobar has reported just 47 slum towns and shared a mere 0.6% of the total slum population. It is very clear that there is a very positive correlation between urban cities and slum concentration. This rise in slum population is inevitable in towns and cities, but by providing better facilities at the rate of their growth will definitely help all the slum dwellers. In the city of Mumbai, 52.5% of the population lives in slums whereas the total geographical area undertaken by them is merely 9% of the city's total. It can be seen by looking at the map of Mumbai where one can find clusters of informal settlements which are officially called as a slum.

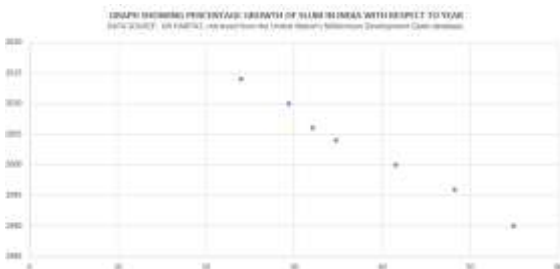


Figure 3 Graph showing slum growth in India,
Source: Author, Data: UN HABITAT, Goals database

II. HISTORY OF SLUM GROWTH IN DHARAVI

According to the data from slum rehabilitation authority, (SRA) Dharavi is located on the northernmost tip of Mumbai island city. It was the home of Koli fishing community and known as Koliwada and the Mahim Creek was their source of fish and livelihood centuries.¹¹ Dharavi was a sparsely populated village before last 19th century. The land was earlier used as an informal rubbish dump which was free and unorganized, so people started settling there. Most of the land in Dharavi is owned by government and government agencies and hence, was suitable for the migrants to setup informal settlement. It has an area of 2.1 sq. km. and a population of about 700,000 to 10,00,000. It was founded in 1883 during British Colonial era. Dharavi has an active informal and unregistered economy with numerous household enterprises and small scale industries employing a large section of slum residents; leather, textile & pottery products are among the goods made inside Dharavi. Nearly 80% of Dharavi's population is self-employed in Dharavi itself. Total annual turnover has been estimated at over US\$ 1 billion (approx. 500 crores INR). Dharavi has suffered from many epidemics & other diseases including a wide spread plague in 1896 which killed over half of the population of Mumbai. The Indian Government has sanctioned huge sums under the pretext of improving sanitation in Dharavi, but none of these claims have been materialized into any development on the ground.

As long as Dharavi was on the edge, the main city was not affected much by the unlawful tenants & their activities. But as the city grew and expanded northwards, the pressure on the land increased and Dharavi was drawn into the heart of the city. Earlier Dharavi was a swamp, a fishing village which has turned into a slum or rather a collection of slum in the present era.

Slum dwellers expanded on the area and built hutments in haphazard manner. An act called the Maharashtra Slum Area Act, 1971 (Improvement, Clearance and Redevelopment) was passed. In 1976, a census of hutments was carried out and photo passes were provided to the families. The people were provided with taps, toilets and electrical connections as part of slum improvement measures. The Sion-Mahim Link road, 60 feet and 90 feet roads were all built around this time along with sewer and water lines laid down. Transit Camps to relocate people, who lost their dwellings in the development was started.

a. COLONEAL ERA

Mumbai has been one of the major urbanizing centres of India for the past 200 years. The most polluting industry was the tannery and the first tannery moved from Peninsular Mumbai to Dharavi in 1887.¹¹ People who worked there, typically assumed to be from the lowest Hindu Cast and Indian Muslims, moved to Dharavi. Other early settlements include the Kumhars, a large Gujarati Community of Potters, the embroiderers of Uttar Pradesh. The colonial government granted them a 99 years' land lease in 1885. These industries created jobs but the government made no efforts to plan on investment in any infrastructure in or near Dharavi. Living quarters and small scale industries grew unsystematically, without provision of sanitation, drinking water, roads and other basic amenities. But some cultural and religious communities that settled in Dharavi at that time helped to build the settlements of Dharavi by forming societies, building schools and temples. Dharavi's first mosque Badi Masjid, was built in 1887 and the oldest Hindu temple Ganesh Mandir was built in 1913.

b. POST-INDEPENDENCE

By the time India achieved Independence after Colonial Rule in 1947, Dharavi had grown to be the largest slum in Mumbai and all of India. It still had some empty spaces which continued to serve as waste-dumping ground for operators across the city; Dharavi was soon carved by the city to be a hub of Informal Economy. Starting from 1950, various redevelopment plans for Dharavi were periodically drawn but none were materialised.

III. PAST SCHEMES OF GOVERNMENT TO DEVELOP DHARAVI

In 1985, the then Prime Minister Late Shree Rajiv Gandhi sanctioned Rs.100 crores for the improvement of infrastructure and housing for the whole city of which a third was reserved for Dharavi. Prime Minister's Grant Project was initiated in 1987 and Maharashtra Housing and Area Development Authority was declared a Special Planning Authority for Dharavi.

In the year 1995, under the Slum Rehabilitation Scheme (SRA) 86 schemes were approved in Dharavi in the period up to 2004. Most of the schemes under SRA were for the areas along the major developed roads of Dharavi. No major S.R Schemes were introduced for the internal parts

of Dharavi due to pathetic access and due to the presence of huge number of commercial units. These initiatives were expanded in the whole of Dharavi along with the existing roads. Major portions of Dharavi remained in unhealthy conditions.(refer table 4)

IV. EXISTING LAND USE ANALYSIS

There are several surveys which had been organized and analysed to generate information regarding optimal planning proposal for comprehensive land development with special emphasis on socio-economic development of the residents of Dharavi.

V. AREA OF SLUM STRUCTURE

According to slum rehabilitation authority (SRA) the survey also indicated that out of 33,550 slum structures details of which are available, between 5 to 15 sq. m., 4462 structures between 16 to 30 sq. m. and 1052 structures more than 30 sq. m. The data depicts that majority of the occupants are living in area lesser than 150 sq. ft.

VI. COMMERCIAL & INDUSTRIAL HOME BASED ACTIVITIES

More than 22% of the structures are used for commercial and industrial and residential-cum-commercial use. Making of papads and drying them in open courtyard or terrace is a major household activity and a form of small scale industry. Dharavi also runs a flourishing business of supplying tiffin boxes. Kumbharwada is Mumbai's biggest pottery colony, located on nearly 5.3 hectares of land in Sector-2. Majority of potters in Kumbharwada are migrants from Saurashtra in South Gujarat. These potters had initially settled in South Mumbai, but as the city grew they were pushed to Dharavi, thereby naming their area as Kumbharwada. There are large industrial units which are located in the area, famously known as 13-compound industrial zone in Sector-1. Most of the garbage generated by the Mumbai Kars arrive at Dharavi in big bags & containers where everything gets recycled such as oil cans, plastic drums, cotton scrap, etc. The labours work in crammed lofts, having bad light and poor ventilation. The recycling industrial activities have given rise to health hazards like Asthma, T.B., Skin Diseases, etc. and hence, rehabilitation in proper structures is impertinent.

Commercial & Industrial Activities	Home Based Activities
Garments	Papad Making
Plastic Recycling	Bidi Making

Dyeing	Zari Work
Aluminium Moulding	Bindi Working
Leather Processing	Leather Goods
Farsan Moulding	Groom Making
Pottery	Pickle Making
Box Making	Button Making

Table 1 Commercial & Industrial Based Activities VS Home Based Activities, Source: Author

VII. NUMBER OF STRUCTURES

Summary of tenements under DRP							
S. No.	SECTOR	Category of structures				Total	Religious
		R	R+C	C/I			
1	Sector-1	7497	22	2513	10032	47	
2	Sector-2	1152	67	2837	14427	79	
3	Sector-3	1008	79	2273	12440	68	
4	Sector-4	9132	32	1964	11128	60	
5	Sector-5	8515	130	1571	10216	42	
6	Grand Total	4675	330	11158	58243	29	
	Total	80.27	0.56	19.15%	100%	6	

Table 2 Types Of Structures, Source: Dharavi Slum Rehabilitation Project

VIII. STRUCTURE OF ARCHAEOLOGICAL IMPORTANCE: REWA FORTE

REWA Forte located in Sector-5 was constructed in the year 1737 which has got a historic importance. This monument is under Archaeological

Survey of India, but due to no proper access from any public road as it is surrounded by slum structures it has not been developed. When the condition of this slum changes another tourist spot will come into existence.

IX. DETAILS OF LAND OWNERSHIP

According to the reports of ownership, the major portions of the land in Dharavi is owned by MCGM. The remaining parts of land belongs to Private, Railways, State Government, and other Public Authorities.

Sr. No.	Ownership	Ha.	Percentage
1	MCGM + MCGM leased + Cemetery + Road	147.77	61.48
2	Private	41.18	17.13
3	Railway	8.92	3.71
4	State Government + Creek Land	37.68	15.68
5	Properties without ownership title to be treated as Government Land	4.80	2.00
	Total	240.35	100%

Table 3 Land Ownership Details, Source: Dharavi Slum Rehabilitation Project

S. No.	Project	Year	Salient Features	Reasons For Failure
1	Slum Improvement Project	1972	Provision of basic amenities to the slum like water, electricity, latrines and sewage disposal	No comprehensive census on number of households and residents were obtained
2	Slum Improvement Project (cont.)	1976	Granting the residents "legitimate status"; Photo identities were issued to establish legitimacy of residents	Administrative issues due to lack of census; de facto control of slumlords over parts of the slum in which no
3	Slum Upgradation Project	1985	Leasing out existing slum land to cooperative groups of slum dwellers at affordable rates; granting loans for environmental and housing improvements	A large portion of the area to be redeveloped was held by private developers and could not simply be redeveloped without adequately compensating them
4	Slum Rehabilitation Scheme	1995	Transferable Development Rights introduced to attract private developers central monitoring and clearing agency developed; redevelopment efforts more decentralized than before	The scheme required consent from 75% of the slum dwellers, which was not obtained due to fragmentation of slum communities

5	Dharavi Redevelopment Project	2004	Rehousing Dharavi's residents into to block apartments; freed up slum land would be sold for private development	Unacceptable to Dharavi residents since livelihood depended on Dharavi's sprawling layout
---	-------------------------------	------	--	---

Table 4 Summary of various Dharavi redevelopment plan, Source: Redveloping Dharavi - The Case Of Slum Redevelopment In Mumbai

X. DETAILS OF LAND OWNERSHIP

According to the reports of ownership, the major portions of the land in Dharavi is owned by MCGM. The remaining parts of land belongs to Private, Railways, State Government, and other Public Authorities.

S. No.	Ownership	Ha.	Percentage
1	MCGM + MCGM leased + Cemetery + Road	147.77	61.48
2	Private	41.18	17.13
3	Railway	8.92	3.71
4	State Government + Creek Land	37.68	15.68
5	Properties without ownership title to be treated as Government Land	4.80	2.00
	Total	240.35	100%

Table 5 Land Ownership Details, Source: Redveloping Dharavi - The Case Of Slum Redevelopment In Mumbai

XI. PROJECTED DEVELOPMENT STATUS

There are several issues in preparing the planning proposal for Dharavi. One of the major problems is that Dharavi people themselves are not sure about the redevelopment because of the government providing them 350 sq.ft of flat while they desire for nearly 450 sqft of flat. Authority has been considering only those people under the criteria of redevelopment who have been there before 2000 and this policy is not acceptable by the people who have started living there post 2000.

a. LACK OF LAND AVAILABLE FOR DEVELOPMENT IN DHARAVI

From planning point of view, availability of land for development is a major issue. Under Dharavi Redevelopment Project Area, a total of 154.74 hectares is available out of which only 106.55 hectares is available for both- rehab and sale component- and the rest area have been carved out for roads and recreational areas such as play grounds.

b. HEIGHT LIMITATIONS DUE TO CLOSENESS TO AIRPORT

Since very little land is available for rehabilitation for the slum dwellers and also for construction of sale component for funding the development, as a result, the rehab buildings are bound to be of greater height. At the same time, the height restrictions imposed by Airport Authority compounds the problem of shortage of land. Only 50-meter height is allowed for construction.

c. RAILWAY BOUNDARIES AND HIGH TENSION LINES

There are several restrictions in Dharavi redevelopment project such as the open spaces which are required by the Railway tracks and side marginal open space along Electric High Tension Line.

d. STANDING HIGH DENSITY

Owing to the high density of the slum structures and horizontal layout, it hampers the feasibility of the projects.

e. COMMUNAL INVOLVEMENT

It is not possible to prepare and implement such a large brown field area without the help of the community. Sometimes, the dwellers are also misguided in believing wrong ideologies which influence the slums dweller into refusing to shift to another place from their location. It is too hard to convince them to move within the same sector and

this becomes the leading challenge during the redevelopment. The issues have to be dealt with by involving community at the stage of planning itself.

XII. SITE ANALYSIS

During the visit in Dharavi, it was observed that their living style and construction techniques are quite slanted. With respect to other slums these shelters are neither permanent nor temporary, the weight of structure gets lighter when they grew vertically. Here are a few pictures sharing my observations about Dharavi. Some of them are positive and some of them are negative.

a. YARD KILN OF KUMBHARWADA (POTTER'S COMMUNITY)

In Kumbharwada community the kiln is located centrally which is used for baking their earthenware pots to harden it which is very

important step but unfortunately it creates a lot of smoke which poses a lot of carbon dioxide and this carbon dioxide breaks down into carbon monoxide which is even more poisonous in comparison to normal quantity of carbon CO₂ which can affect the human lungs adversely. In Dharavi all the kumhar shelters are located around this kiln. In this community the ground floor adjacent to main street are commercial shops for retail and upper floor is used for production area and top floor is used for living. Shelters which are located around the kiln are open from centre just like courtyard planning in earlier times hence all the first floor of shelter have the windows opening towards the open space and this opening also admits the sun light and the location where sun light hits floor is used for drying earthen ware.

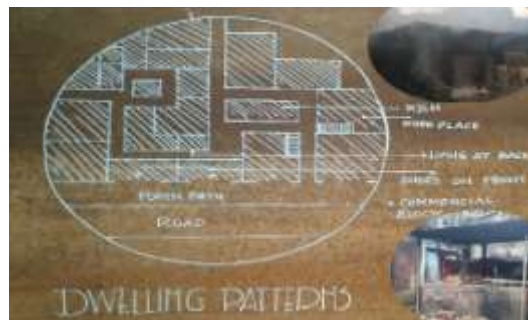


Figure 4 Location of kiln inside the Dharavi, Source: Author



Figure 5 Section Of Dwellings, Source: Author



Figure 6 Showing how potters save their kiln from rain



Figure 7 Showing how potters save their kiln from rain

b. LOCALITY AROUND DRAIN

It is estimated that over 600 sewer workers die every year because of the lethal fumes inside the sewer which is more than 10 times the Indian soldiers killed by terrorist. Here, in Dharavi people live round the year breathing in the venom which is blatant self-harm. Being adjacent to Mitthi river, sewer lines run through the area and a lot of open drains are also present in which people throw their garbage making it extremely filthy and unhygienic thereby providing solid proofs of lack of proper disposal system in Dharavi. The concerned authorities clean the drains once every year during the onset of the rainy season. There are some people

who segregate the hard sludge using a sieve in the drains which run close to the gold smith workshops, in an attempt to find some gold crush which, they can convert into money to aid their survival.

c. BELIEF IN SUPER NATURAL POWER

Having as little as a 10ft x 10ft room which is used by 10 people for living, people in Dharavi still do not harm and acquire the space which is used for worshipping which reveals their faith in super natural power (God). They have imbibed the worship spots within their locality. In Hinduism trees took a lots of importance either it is for spirituality or environment.



Figure 8 Trees Growing Between Dwellings, Source: Author

d. CONSTRUCTION IN DHARAVI

Having narrow streets and no direct connectivity with main road it is not possible to bring construction material through large vehicles hence handcart facilitate the transportation of material to the construction site from nearest shop. The shelters here are neither permanent nor temporary.

e. MATERIALS

Materials are tough and stronger in ground floor. The weight and strength of the materials

subsequently decrease in the upper floors so as to ensure safety and balance of the structure.

Ground floors are generally constructed with stone or ceramic tile for flooring and walls are of red brick or AAC blocks and well finished with cement plaster with paint. Some shelters also have tile flooring inside. Roofing is structured with I-section of mild steel. Occasionally timber may be used. Commonly upper floors are made of timber or other light weight material and topped off with pitched roofs made of MS sheets with slope.



Figure 9 Showing Materials Used, Source: Author



Figure 10 Showing Materials Used, Source: Author

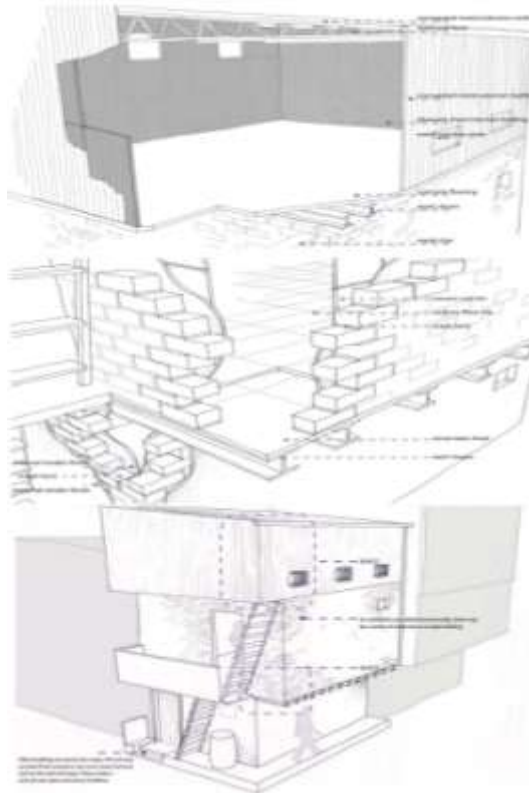


Figure 11 Showing Materials Used, Source: Author

XIII. PROPOSED DESIGN FOR REHABILITATION

The following are the proposal for the design -

a. INTRODUCTION

Rehabilitation master plan should be in such a manner that, inhabitants of Dharavi feel satisfied with the idea of redevelopment. And it

should also consider that after the redevelopment it should not get converted into a vertical slum from horizontal slum.

Since it is hot place of Mumbai because of good connectivity with economically strong locality with Mumbai's local railway lines in proximity, so one of the major objective is to create Dharavi a thriving market which would in fact be beneficial owing to the fact that Dharavi is a thriving industry already and if a good market place can be developed here it will grow and flourish considerably. These efforts will help to convert a slum into a heaven.

b. VISION & CONCEPT STATEMENT

During my visit in Dharavi, I noticed that some shelters facing each other are separate on ground floor and a passage runs between these shelters to enable movement but at the slab level these shelters are connected and this space is used as balcony. This structure gave me the concept for redevelopment of Dharavi.

We all know very well that the land area is not sufficient for rehabilitation of this huge population. And when we are designing the building we have to place two towers in a manner that they have space between them as per their heights and fire setbacks.

So the concept is to place blocks separately at ground, but after G+4 floor (at a height of nearly 15m) a connected slab is laid which binds all the four clusters and thus we can save ground setbacks of towers.

c. MULTIPURPOSE SPACE CREATION

The alternate floors which is created between blocks are treated as terrace gardening so that the space which is built at ground level will

provide green space at top, thereby incorporating nature which can be used for physically challenged people or old people for yoga, walking, and other recreational purposes.

This will solve the problems for those people who are not physically well or are unable to come down to the ground floor from 5th or 15th floors for getting fresh air. The same place can be used by the kids in the evening for playing which being so close to residential units will assure the parents to feel secure about their kids. Thus a small place can solve many little problems.

d. SITE PLAN

According to slum rehabilitation scheme 35% land will be the property of the developer and the land developer makes housing for rehabilitation of slum dwellers in accordance to this scheme. But due to height restriction in Dharavi no developer has been able to extract the true value of the land, because they could mint money only if it was possible to make high-rise. Thus the proposed land for sale should be along the road which will enable the developer to make maximum money from this land even if he can't raise the structure vertically. So the map showing red area is proposed land for sale.

Central part of the area is used for rehabilitation of commercial activities so that, Dharavi can grow up as a thriving marketing industry along with the recycling and industries. This location is also best for commercial activities because it has physical value of land, Dharavi main roads are here and it forms like an eye land. Between the main road of Dharavi and the commercial zone residential area is proposed.

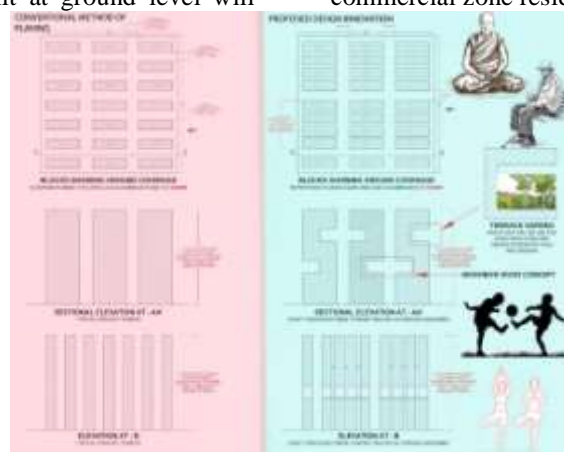


Figure 12 Site Details, Source: Author



Figure 13 Existing Site Plan Of Dharavi, Source: Author



Figure 14 Showing Close Shelters In Slums, Source: Author



Figure 15 Showing Close Shelters In Slums, Source: Author



Figure 16 Proposed Site Plan Of Dharavi, Source: Author



Figure 17 Proposed 3-D View Of Dharavi, Source: Author

e. CLUSTER LAYOUT PLAN

Land availability in Dharavi for rehabilitation of slum dwellers are not sufficient and if common planning method is applied then whole site convert in concrete jungle and due to setback between two blocks land between blocks will not be utilise

o, the idea is to make a block which contain 5 floors and these blocks put adjacent to each other in this manner which shown in image, connecting

overlapped portion will be used for vertical connectivity forming stair and top part of block convert in garden space proffering terrace garden which will be used by kids for playing and elders for yoga and other purposes, cavity between blocks make air cool and allowed to go forward which is not possible in conventional planning methods.

and the main part is in this manner of planning, we can provide 2 times more green space with respect amount of space covered at ground.



Figure 18 Proposed Building Block Development, Source: Author

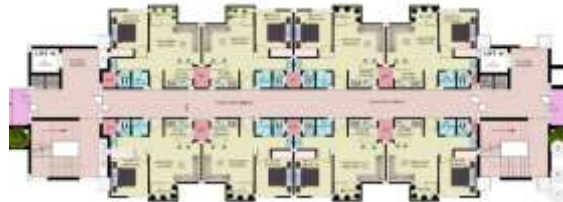


Figure 19 Proposed Plan Of Typical Floor, Source: Author



Figure 20 Proposed Unit Plan, Source: Author



Figure 21 Proposed View Of Building, Source: Author



Figure 22 Proposed View Of Building, Source: Author



Figure 23 Transformation, Source: Author



Figure 24 3-D Block Model, Source: Author



Figure 25 3-D Block Model, Source: Author

XIV. LITERATURE REVIEW

The Slum Rehabilitation Scheme (SRS) completed 23 years in 2020, and over these two decades the scheme has had its just segment of success and failure. From time to time, the Slum Rehabilitation Authority (SRA) has drawn criticisms on various fronts like the provision of free housing, involvement of developers, and implementation processes that created opportunities for enormous corrupt practices. The successes however are few and one of the successes is in its in situ rehabilitation. Therefore, it seemed an opposite time to examine the scheme for its presentation and influence on the housing sector at large, and its expanding role in the state and country.

In the last 20 years, ever since SRS's establishment in 1997, its success rate has been less than 13 percent. As many as 1,524 projects were started out of which 1,100 are still being developed and only 197 projects have been completed. A mere 1.53 lakh families have been rehabilitated against the 8 lakh units promised in the first 5 or 6 years. In simple words Dharavi is not just slum, it plays a big role in GDP of India's economical capital. So the rehabilitation of this area is important in such a way that it reflect the indie's best rehabilitation.

XV. OBJECTIVES

There's an analogy that Shirish B Patel (Urban Planer) once used while writing in the economic and political weekly. He stated that-A big ship, with many workers who do various kinds of jobs on board, they can work on ship the whole day for which they would get paid. But in the evening, they can't stay on the ship, but spent the whole night in the sea water and if they survive getting not eaten by sharks they will have to report to work in the morning at 8. And if they do not then there were

many others in line, who would do the job for even less salary.

Being an architect is not just designing skyscrapers and villas, but also bearing our responsibilities towards the nation and its development. No country can be progress without the looking after and satisfying the lower income groups. This project mainly focuses on providing affordable housing with good amenities to people who slog the entire day for our comfort.

For me solving the problem is the basic essence of architecture.

REFERENCES

- [1]. Indoor air quality among Mumbai's resettled populations: Comparing Dharavi slum to nearby rehabilitation sites.
- [2]. According to the report by National institute of Urban Affairs.
- [3]. P.K. Das, According to an article in "INDA TODAY"
- [4]. The circular economy of Dharavi: making building material from waste
- [5]. Slum rehabilitation Authority: SRA
- [6]. Definition of slum by "Census of India"
- [7]. Analogy by Shirish B Patel (Urban Planer) in economic and political weekly.
- [8]. UN HABITAT, retrieved from the United Nation's Millennium Development Goals database.
- [9]. The study of slums as social and physical constructs: challenges and emerging research opportunities.
- [10]. Praveen Kumar, Slums in India: Results from Census,2011
- [11]. Dharavi, Slum rehabilitation authority (SRA)
- [12]. NUS, Redeveloping Dharavi: The case of slum redevelopment in Mumbai (Table-01)
- [13]. Dharavi- Informal settlements & slum upgrading (Figure)