

# **B.D.D. CHAWLS SURVEY, FINDINGS & REDEVELOPMENT STRATEGIES**



## **Mumbai Transformation Support Unit**



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**August 2009**

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## **ACKNOWLEDGEMENT**

This report is the culmination of the study of B.D.D. Chawls in Mumbai, undertaken by the Mumbai Transformation Support Unit (MTSU)

The Mumbai Transformation Support Unit (MTSU) is thankful to the Secretary, Housing Department, Government of Maharashtra for entrusting this study to MTSU. The MTSU is thankful to Mr. Gautam Chatterjee, CEO and Vice-President MHADA, Mr. Shirish Patel, eminent Architect and Planner, for their valuable inputs on the draft report. The MTSU is also thankful to the Executive Engineer, P.W.D. in charge of BDD chawls for sharing the drawings and data. The MTSU is also thankful to **Team of Research Investigators and Process Services (TRIPS)**, who carried out detailed survey and collected socio-economic data from the BDD chawl residents.

U.P.S. MADAN  
Project Manager

## **PROJECT TEAM**

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## **1. INTRODUCTION**

A Housing policy was tabled in the legislative assembly of Maharashtra in November 2008. The redevelopment of BDD chawls and old colonies is one of the major objectives declared in the policy. The redevelopment of BDD chawls, located in the heart of Mumbai, is also envisaged as a model for redevelopment of the old colonies, so as to provide existing occupants better housing and also to optimize the development potential of the land.

A detailed study of the BDD chawls was considered essential by the Department of Housing before undertaking such redevelopment. This study of BDD chawls was undertaken by the Mumbai Transformation Support Unit at all the four locations, namely Worli, N.M Joshi Marg, Naigaon and Sewri.

Aims and objectives of the BDD chawl study:

- a. Understand the socio-economic status of people living in BDD chawls
- b. Understand the use of constructed buildings
- c. Understand the physical condition of the structures and infrastructure.
- d. Assess the potential for redevelopment
- e. Suggest alternative reconstruction options
- f. Suggest organizational, financial and policy strategies for redevelopment.

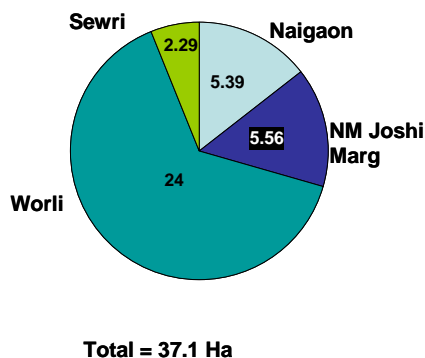
This report is prepared to present the findings and strategies for redevelopment of BDD chawls.

## 2. HISTORY OF BDD CHAWLS

The Bombay Development Department (BDD) was set up in 1920 by the then Governor of the province, Sir George Lloyd who was appointed by the British Government of India. Lloyd believed that the housing problem contributed to the political unrest in the city. He designed a massive scheme for housing and development and decided to undertake the same on behalf of the government rather than entrusting it to the Bombay Improvement Trust (BIT) or the Corporation. A civil servant was appointed by him to oversee the execution of the scheme. The department was financed through a development loan and a one rupee town duty was levied on each bale of cotton entering the city.

Plots of land for BDD chawls at Worli, Naigaon and N.M.Joshi Marg were acquired through purchase while that at Sewri was leased for 99 years. As shown in the chart below, the plot of land at Worli is 23.9 Ha, Naigaon is 5.39 Ha, N.M.Joshi Marg is 5.56 Ha. The plot at Sewri is the smallest with 2.29 Ha. The total cost of land purchased was approx. Rs. 54 lakhs. Lease rent per year for Sewri plot was Rs. 2.19 lakh per year.

**Chart 1: Size of Each Location in Ha**



The construction of 207 chawl buildings, each with 80 rooms, was completed between 1921 and 1925. The chart below shows the number of buildings at each location. Worli has the highest with 121 buildings.

**Chart 2: Number of Buildings**

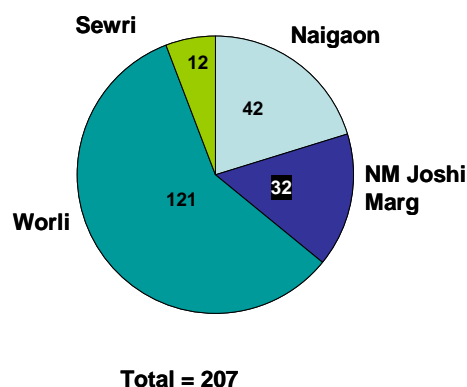


Table 1 presents the number of chawls, details of plot area, cost of land and number of buildings. It is seen from the table that average unit cost for buildings at each location varied between Rs. 1 lakh to Rs. 1.39 lakh.

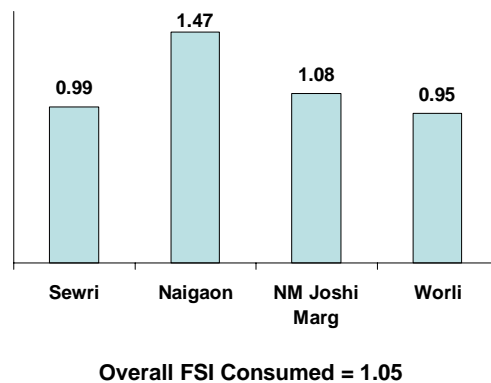
**Table 1: Details about the BDD chawl land, tenure and cost of construction in 1921**

Location of chawl	Area of plot (Sq.m.)	Cost of land (Rs.)	No. of buildings	Cost of construction of one building (Rs.)
Worli	239,000	2,889,151	121	100,729
Naigaon	53,900	1,075,000	42	138,789
N.M.Joshi	55,640	1,441,106	32	118,750
Sewri	22,900	219,025 (Rent per yr)	12	101,000
<b>Total land</b>	<b>371,440 (37.14 Ha or 92.86 acres)</b>		<b>207</b>	
<b>Total Cost of BDD chawl project including all the necessary infrastructure (internal road, sewage, drainage) completed between 1922-25</b>				<b>34,855,569 (Rs 3.49 crore)</b>

- Total cost of the BDD chawls project was Rs. 3.49 crore for 16,544 tenements.
- Average cost of one tenement of 160 sq. ft. in 1925 was approximately Rs. 2,115 including the cost of land and necessary infrastructure.
- Average land cost per sq. mt. was Rs. 12 at Worli, Rs. 20 for Naigaon, Rs. 26 at N.M. Joshi Marg.
- Rent (approx) of Rs. 10 per sq. mt /year for land at Sewri for 99 years.

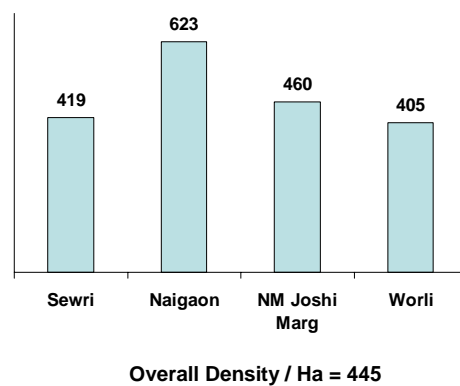
The average FSI Utilization in the four chawls is 1.05. It is highest at Naigaon with 1.47 and Worli is the lowest at 0.95.

**Chart 3: FSI Utilization**



The overall tenement density of 445 tenements / Ha is on the higher side. At Naigaon this density is extremely high at 623 tenements / Ha.

**Chart 4: Tenement Density / Ha**



Tables 2 and 3 below provide a summary of the chawls in all four areas.

**Table 2: Details of BDD chawls**

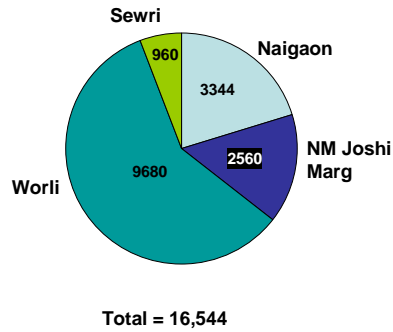
Location/details	Worli	N.M.Joshi	Naigaon	Sewri	Total
Municipal ward	G /S	G /S	F / N	F / S	
Total No. of buildings (Gr.+ 3 stories)	121	32	42 (1 bldg 1+2)	12	207
Total No. of tenements (80 per building)	9,680	2,560	3,344	960	16,544
No of buildings with police dept. and MCGM	19	8	18	5	
No. of tenements with police and MCGM	1,520	640	1,440	400	4,000
School rooms in complex	110	Nil	60	7	177
Hospital rooms in complex	86	95	13	-	194
No. of Shops	293	28	25	58	404
Net Residential rooms	9,191	2,437	3,246	895	15,769
Nearest railway station.	L. Parel Curry Rd	L.Parel Curry Rd	Dadar	Sewri	
Distance from Rly.Stn	2 kms.	500 m.	1.5 kms.	20 m.	
Area of plot in Ha.	2,39,000	55,640	53,900	22,900	3,71,440
Common Amenities Within 500 mt.	Rly, Bus, Mkt, Sch Ground	Rly, Bus, Mkt, Sch Ground	Rly, Bus, Mkt, Sch Ground	Rly, Bus, Mkt, Sch Ground	
Employment within 2 km	Services, Industry	Industry, Market	Industry, Rly, Port	Industry, Rly, Port	
O.H Water Tank (lt)	145,000	nil	nil	nil	
U.G Water tanks (Lakh lt)	39.15	1.50	3.00	11.65	
Sewage disposal	All drainage lines connected to BMC Drainage system				
Rain water drainage	All storm water drains connected to BMC drains				
Electrical Service	All BDD chawls get their electricity from BEST				

**Table 3: Land Area, space utilization and population density of BDD chawls and details about surveyed rooms.**

Location/details	Worli	N.M.Joshi	Naigaon	Sewri	Total
Land Area (sq. mt)	239,000	55,640	53,900	22,900	
Total number of buildings	121	32	42	12	
Total Built up area (sq.m)	228,753	60,497	79,402	22,686	
Ground coverage (sq. m)	57,188	15,124	19,850	5,672	
Ground coverage (%)	24 %	27.18 %	36.82 %	24.76 %	
Recreation spaces	6	-	1	2	
Road length (M.)	1,542	936	590	324	3,392
Area under roads (sq.m)					
Religious buildings	6	3	2	2	13
F.S.I (as % of gross area)	0.95	1.08	1.47	0.99	
Gross Tenement density/Ha	405	460	620	419	445
Total no. of rooms in chawls	9,680	2,560	3,344	960	16,544
Total no. of surveyed House holds	8,081	2,228	2,876	870	14,055
Rooms used as Hospital	86	95	13	-	194
Rooms used as shops	293	28	25	58	404
Rooms used as school	110	nil	60	7	177
No. of rooms used as residence	9,191	2,437	3,246	895	15,769
% of residential rooms to total rooms	94.94	95.20	97	93.22	95.00

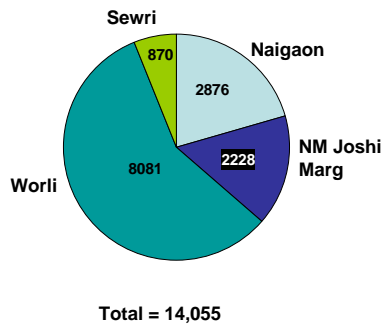
Worli, with the largest number of buildings, has more than 50% of the total tenements. Sewri is the smallest with only 960 tenements.

**Chart 5: Number of Tenements**



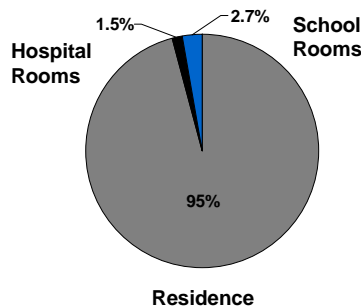
As seen from the chart below, MTSU’s survey of the BDD chawls covered 14,055 i.e. approximately 85% of the total 16,544 tenements.

**Chart 6: Number of Rooms Surveyed**



95% of the rooms in the BDD chawls are used for residential and commercial purposes. The remaining rooms are used as hospital and school rooms. In places like Worli an entire building has been used as a hospital.

**Chart 7: Rooms used for Various Purposes**



### 3. PRESENT STATUS OF THE CHAWLS

**a. Physical Condition of BDD Chawls**

**i. Building design**

All the buildings of BDD chawls constructed at four locations have identical building design. All are ground plus three floor structures. Typically, a building has 10 rooms each on both side of the corridor on all floors. Each room has a 'nahani' and a kitchen area with storage loft above. The room size is 10'X12'-3". Two toilet blocks, one for women and one for men, with three WC's in each are provided at one end of the corridor along with a spiral staircase as fire escape (at some places). Entrance to the building is at the opposite end on the ground floor, while the main staircase is located in the middle of the length of the building. The staircase also has a direct access from outside. (See building plan included in Annexure A)

Chawl buildings constructed in Naigaon have a similar building plan as at other locations except the larger openings with a low sill height and with vertical safety iron bars. A small nahani is provided in each room and there is no provision for kitchen as in other tenements. All rooms have been provided with cross ventilation with a concrete 'jali' above the door opening in the common passage.

A three meter wide common passage is a community as well as utility space and acts as a lobby for each tenement. Folding cots are laid in the passage when required for sleeping. There are clothing lines in the common corridor that are used by the residents. The passage also provides space for shoe racks, extra furniture, play space for children and gathering space for women. There are three entry points on ground floor passage, which act as the entrance lobby.

All rooms are well lit and have one large window opening in the outer wall. Kitchen platforms were not originally provided, but most households have got them made. Many have converted nahani into bathrooms and some have even installed WC's in the room and have added external plumbing as well. Many have changed the flooring material and painted the houses from inside. Some of the households have furnished their rooms and kitchen with modern material and even designer kitchens and high quality fixtures. However in the buildings which are used as police quarters, renovation is on a moderate scale and not at all expensive.

Lofts were provided in the original construction, and a few tenants have added new lofts above the entrance door to create additional storage space.

#### **ii. Construction materials and finish**

The construction is of R.C.C framed structure with filling walls of concrete blocks, 80 mm thick with tongue and groove joints. The staircase is finished with Shahabad tiles and G.I pipe railing.

The buildings do not have external plaster and paint. However, some buildings have been repaired in the past and walls have been plastered in parts. Some buildings are painted but generally the external walls are not well maintained.

The internal finish includes plastered walls and I.P.S flooring. Many tenants have changed the flooring and painted walls from inside. However the common central passage has not been painted at most places. Even the buildings with the Police Department and Municipal Corporation are also not properly maintained.

**iii. Structural and Physical Condition of buildings.**

**Table 4:**

BDD Chawl	Condition of buildings	Nature of external repairs carried out over the years	Problems with the structure
All places	<ul style="list-style-type: none"> <li>▪ Generally buildings appear structurally sound.</li> <li>▪ Occasional cracks in external walls are noticed.</li> <li>▪ Leaking roofs is the common complaint</li> <li>▪ Sanitary blocks are repaired and renovated with ceramic glazed tiles in most buildings.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Occasionally plastered, some windows replaced with aluminium and glass</li> <li>▪ Varied but generally not systematic.</li> <li>▪ Open spaces, footpaths are in very poor condition</li> <li>▪ Additions/alterations seen which appear to be uncontrolled</li> <li>▪ Conversion of some tenements into shops/offices</li> <li>▪ Maintenance of building and external areas is rather poor.</li> </ul>	<ul style="list-style-type: none"> <li>▪ R.C.C columns are 230 x 230 mm and some places need to be repaired.</li> <li>▪ Reinforcement is exposed and corroding at few places.</li> <li>▪ Structural repairs needed at places.</li> <li>▪ Staircases need repair and refinishing.</li> <li>▪ Railings are damaged in many buildings.</li> <li>▪ Non Destructive Testing may be useful for ascertaining the structural strength</li> </ul>

**b. Operation and Maintenance of BDD chawls**

Out of 207 buildings, 167 buildings are rented out to individuals or to associations by the State government through its Public Works Department (PWD). Maintenance of buildings used as police and MCGM staff quarters is also handled by PWD and the cost of repairs is recovered from the respective organizations. The rest of the buildings are maintained by the P.W.D of the state government at their own cost.

Two buildings, one at Worli and one at N.M.Joshi Marg are used for community medical services and hospital by The Bombay Mothers and Children Welfare Society, a charitable trust, since 1930's. The building at Worli is a 40 bed

hospital with medium range medical services being provided at a reasonable cost. The building is maintained by the society and is newly renovated. It has an operation theatre, maternity facilities, as well as an OPD. A crèche and nursery for children of working mothers is run from part of the ground floor. The building at N.M. Joshi Marg houses 100 patients and their relatives and is used as Convalescent Home for Cancer patients coming from outside Mumbai for treatment at the Tata Memorial Cancer hospital. A rent of Rs. 1 per year is collected from the society for each building.

One building at Worli is given to a government institute for training of the blind people. Approximately 60 students are provided with training in handloom weaving, basket and broom making and other crafts. Two floors are used for the training classes and workshops, while the third floor is used as student's hostel. The maintenance of this building is also done by PWD.

**i. Data about O and M of buildings**

The basic data on the demand and recovery of the rent and the expenses incurred in the last three years are given in the following tables.

**Table 5 (a): Rent demanded by PWD from the tenanted property and recovery thereof (in Rs. Lakh)**

<b>Year</b>	<b>Demand</b>	<b>Recovery</b>	<b>Recovery %</b>
2005-2006	186.35	55.05	29.54
2006-2007	197.64	62.01	31.37
2007-2008	198.20	52.43	26.45

**Table 5 (b): O and M Expenses incurred by P.W.D (in Lakh Rupees)**

Year	Repairs	Electricity	Taxes	Water	Govt Staff	Total Expenses
2005-06	798.61	73.61	43.75	.036	360	1,276
2006-07	544.76	93.45	45.94	.036	396	1,080
2007-08	588.97	86.85	52.77	.036	432	1,161

*Note: Average salary of 300 PWD workers considered as Rs. 10,000 per month, Rs. 11,000 per month and Rs. 12,000 per month for 2005-06, 2006-0 and 2007-08 respectively.*

**Table 5 (c): Income and expenditure of BDD Chawls**

Year	Actual Income from rent (Rs. Lakh)	O & M expenses (Rs. Lakh)	Difference (Loss- Rs. lakh)
2005-06	55.05	1,276	1,121
2006-07	62.01	1,080	1,018
2007-08	52.43	1,161	1,108

## ii. History of Transfer of Tenements

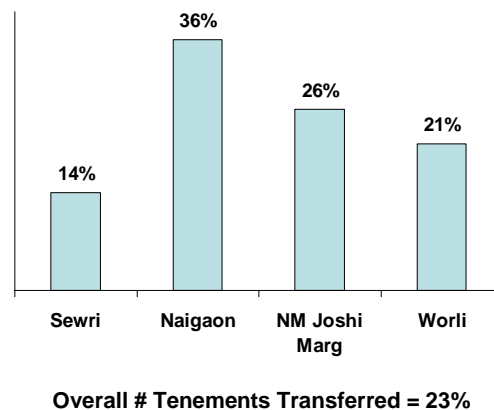
Since the buildings have been constructed more than 80 years ago there have been number of transfers in occupancy for various reasons. The extent of transfers is shown in the table below.

**Table 6: Extent of transfer of tenements.**

Location	Total HH surveyed	Transferred	% of tenements transferred
Worli	8,081	1,687	20.88
N.M. Joshi Marg	2,228	569	25.54
Naigaon	2,876	1,038	36.09
Sewri	870	124	14.25
<b>Total</b>	<b>14,055</b>	<b>3,418</b>	<b>24.32</b>

As seen from the chart below, Naigaon BDD chawls have the highest percentage (36%) of room transfers among all BDD Chawl locations, followed by N.M.Joshi Marg (25.54%). Some of the rooms are transferred more than once, however, data about such multiple transactions could not be obtained.

**Chart 8: % Tenements Transferred by Original Occupant**



The survey has also compiled data on transfer of tenements in each of the decade since the occupation of chawls in 1920's and it is presented in the table below.

It is seen from the above table that the transfer of tenements is taking place on a large scale since 1971. The rate of transfer has increased in each of the subsequent decades. The highest number of tenements was transferred in the current decade (1,109 tenements) since 2001.

The transaction cost of transfer of tenement has not been explored by this survey.

**Table 7: Number of tenement transferred in each decade since 1920's.**

<b>Decade</b>	<b>No. of tenements transferred</b>
1921 to 1930	2
1931 to 1940	4
1941 to 1950	14
1951 to 1960	32
1961 to 1970	98
1971 to 1980	353
1981 to 1990	541
1991 to 2000	523
2001 to 2008	1,109
Not Answered	144
Do not know	598

The tenancy transfers have been made by occupants with or without the consent from the PWD. Compared to the total number of tenements, the percentage of transfers is 24%. It can therefore be inferred that approximately 75% of occupants are either original occupants or their legal heirs. This is also true for the rooms rented by the police department or the MCGM to their staff members. Most of the present occupants are heirs of the original employees and they have continued to occupy the rooms because one of the family members is absorbed by the police department or the MCGM. Hence the original tenancy is transferred to a new member of the original family.

PWD, which is in charge of the maintenance of BDD chawls has not kept updated information or a record of transfer of tenements. Hence the data collected by the survey could not be verified with the authority. It is also revealed that many tenants have illegally transferred the tenements through “Pagri” system, without seeking permission from PWD. PWD has a legal set of procedure for the transfer of rooms. However, tenants transferring the tenements rarely follow it.

### iii. Additional Property Owned in MMR

Some of the tenants of BDD chawls have managed to purchase some property in Mumbai metropolitan region. Such properties are purchased in various localities and are found in regular buildings as well in slums and chawls as additional house, though the owners occupy the BDD chawl as their first preference. The number of additional house acquisition is recorded in the following table.

**Table 8: Additional property owned by the BDD chawl tenants in MMR.**

	Worli	N.M.Joshi Marg	Naigaon	Sewri	Total
No. of tenants who have additional property in MMR	223	81	129	32	465
Total no. of surveyed households	8,081	2,228	2,876	870	14,055
% of tenants with additional property	2.76	3.64	4.49	3.68	3.31

It can be seen from the table that the number of households with additional houses in MMR is very small (just 3%). This information indicates that very few present residents of the BDD chawls have invested in additional property in MMR. It could be both due to the lack of need or lack of additional resources required to procure new houses in MMR. It also shows that the occupants wish to continue staying in their present locality.

### iv. Repairs, additions and alterations by Tenants

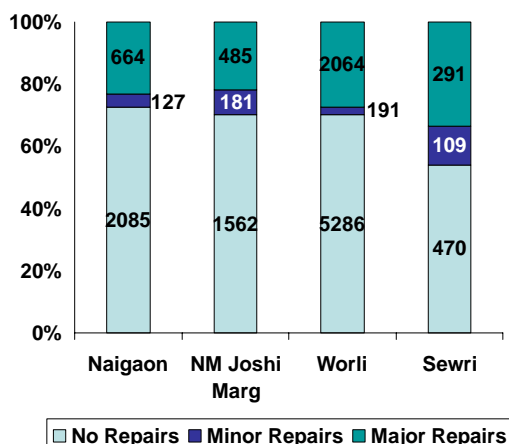
Since most of the tenants of BDD chawls have been residing there for decades, the survey tried to find out if the tenants have carried out any repairs or have made any additions or alterations to their rooms. Reported minor and major repairs to tenements are presented in the table below:

**Table 9: Number of households who have carried out repairs to the tenements.**

No. of tenements	Worli	N.M.Joshi Marg	Naigaon	Sewri	Total
Major repairs	191	181	127	109	608
Minor repairs	2,064	485	664	291	3,504
Total tenements repaired	2,255	666	791	400	4,112
Total no. of surveyed HH	8,081	2,228	2,876	870	14,055
% of tenants who have carried out repairs.	27.90	29.89	27.50	45.98	29.26

It is seen from the next chart that while some of the tenants have carried out major repairs, a large number of them have carried out minor repairs in their tenements depending upon their capacity of investment and inclination. Minor repairs are painting, water-proofing and some cosmetic changes. Major repairs comprise changing of windows, doors, floor tiles, plaster to wall and ceiling, addition of kitchen platform and bathroom (and even WC in some cases) etc. Major repairs involving large expenses were also seen in a few cases. Some of the tenants have added a toilet by putting up additional external plumbing and sewage connection to the drainage chamber. At some places existing windows and walls below the sill level are removed and a floor slab added to extend the room and storage space beyond the external wall. Approximately 30% tenants have carried out some kind of repairs to their rooms. However, most of the tenants depend on the PWD for the necessary repairs.

### Chart 9: Repairs Carried Out by the Households



**v. Perception of tenants about the condition of the tenement:**

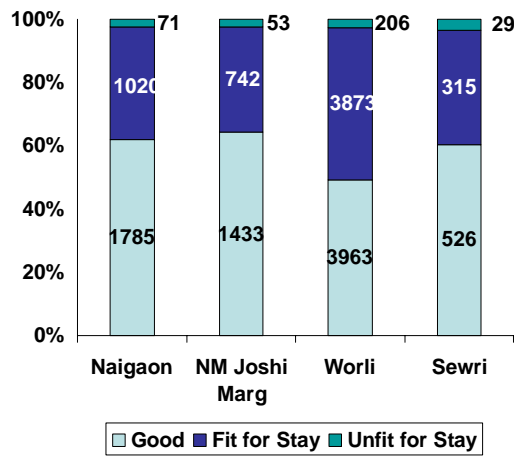
The tenants were asked to give response to the question regarding their perception of the room as good, fit to stay or unfit to stay. Tenants’ responses are presented in the following table.

**Table 10: Perception of tenants**

Condition	Worli	N.M.Joshi. Marg	Naigaon	Sewri	Total	%
Good	3,963	1,433	1,785	526	7,707	54.83
Fit for stay	3,873	742	1,020	315	5,950	42.33
Unfit for stay	206	53	71	29	359	2.55
<b>Total</b>	<b>8,081</b>	<b>2,228</b>	<b>2,876</b>	<b>870</b>	<b>14,055</b>	

It is seen from the chart below that more than 97% of occupants perceive the condition of house as good or fit to stay. This shows a great satisfaction level of occupiers even after 80 years and with a very small size of the tenement. The satisfaction may be linked to many factors such as location of the chawls vis-à-vis jobs, infrastructure and amenities, low rent, feeling of community etc.

**Chart 10: Tenants’ Perception of Condition of Houses**



**c. Community structure and composition of BDD chawls**

The survey collected information regarding the number of occupants, their socio-economic and community character. Salient features of the community are presented in this section of the report. Occupants staying in Police or MCGM quarters are included without distinction.

**i. Occupancy of BDD Chawls and total population**

The survey noted the number of occupants living in each of the tenement rooms in all the BDD chawl locations. The number of occupants living in BDD chawls is presented in the following table.

**Table 12: Number of family members in households of BDD chawls.**

Persons in HH	No. of households in BDD chawls.					
	Worli	N.M.Joshi Marg	Naigaon	Sewri	Total	% of Total
1	226	41	50	27	344	2.45
2	521	139	169	82	911	6.48
3	1,091	277	387	150	1905	13.55
4	2,235	680	911	224	4,050	28.82
5	1,766	526	624	149	3,065	21.81
6	963	216	315	91	1,585	11.28
7	443	112	165	60	780	5.55
8	309	75	99	39	522	3.71
9	133	38	34	10	215	1.53
10	133	52	48	12	245	1.74
11	37	9	19	8	73	0.52
12	63	17	19	6	105	0.75
13	16	3	5	3	27	0.19
14	12	3	6		21	0.15
15	21	15	8	1	45	0.32
16	4		3	2	9	0.06
17	5	2	3		10	0.07
18	4	2			6	0.04
20	4	2			6	0.04
21	3				3	0.02
22	1	1			2	0.01
30		1			1	0.01
35		1			1	0.01
Not applicable	91	16	11	6	124	
<b>Total</b>	<b>7,990</b>	<b>2,212</b>	<b>2,865</b>	<b>864</b>	<b>14,055</b>	

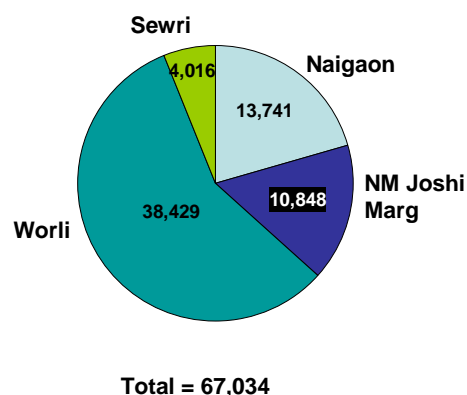
It is seen from the table that the number of occupants per household varies from 1 to 35. However, the most common number of occupants ranges from 3 to 6. The number of households with 4 family members is the highest (4,050 or 28%).

Occupancy of 5 persons in a household is seen in 3,065 household (22% of the total). Households with 3 and 6 members come next with 14% and 11% of the total respectively. Thus the category of 3 to 6 members is the largest with 10,605 households or around 76% of the total surveyed households.

The highest number of occupants, 30 and 35 is found at N.M.Joshi Marg only.

These high occupancy households have more than one room with them and mostly these rooms are held by 'Gramastha Sabha'. Many of the high occupancy households have only male members staying together. The total population, as calculated from the occupancy as listed in the table, is worked out for each of the locations of BDD chawls. The population in each of the chawl locations is presented in the following chart.

**Chart 11: Number of People Residing in the BDD Chawls**



It is seen from the above table that the total number of people staying in all the BDD chawls is around 67,034. The highest number of people (38,429 i.e. of 54%) is staying at Worli while only 4,016 people (6%) are staying in Sewri.

**Table 12: Population of BDD chawls based on occupancy data.**

No of persons/HH	No. of occupants				
	Worli	N.M.Joshi Marg	Naigaon	Sewri	Total no. of occupants
1	226	41	50	27	344
2	1,042	278	338	164	1,822
3	3,273	831	1,161	450	5,715
4	8,940	2,720	3,644	896	16,200
5	8,830	2,630	3,120	745	15,325
6	5,778	1,296	1,890	546	9,510
7	3,101	784	1,155	420	5,460
8	2,472	600	792	312	4,176
9	1,197	342	306	90	1,935
10	1,330	520	480	120	2,450
11	407	99	209	88	803
12	756	204	228	72	1,260
13	208	39	65	39	351
14	168	42	84	0	294
15	315	225	120	15	675
16	64	0	48	32	144
17	85	34	51	0	170
18	72	36	0	0	108
20	80	40	0	0	120
21	63	0	0	0	63
22	22	22	0	0	44
30	0	30	0	0	30
35	0	35	0	0	35
<b>Total</b>	<b>38,429</b>	<b>10,848</b>	<b>13,741</b>	<b>4,016</b>	<b>67,034</b>

## ii. Occupancy of more than one room per family

Though originally one room was allotted to each family, with the passage of time, some families have managed to acquire more rooms. The table below gives the break up of the position:

**Table 13: Number of rooms occupied by surveyed Households**

No. of HH with occupied no. of rooms	Worli	N.M.Joshi Marg	Naigaon	Sewri	Total
1	7,518	2,159	2,767	797	<b>13,241</b>
2	459	57	90	50	<b>656</b>
3	67	6	17	21	<b>111</b>
4	15	4	1	2	<b>22</b>
5	17	1	1	0	<b>19</b>
6	5	1	0	0	<b>6</b>
HH with more than one room	563	69	109	73	<b>814</b>

It is seen from the above table that the number of households having more than one room is just 814 (i.e. 5.8%) out of the total of 14,055 surveyed household. Out of these 814 households, two room holding households are 656 followed by three room households which are 67 in number. Households with 4 to 6 rooms are mostly Gramastha Mandals. These Gramastha Mandals rent out space to individuals on monthly basis and the rent charged is Rs. 100 per month. The number of occupants staying in such rooms varies from 15 to 25 persons. Detailed data about such arrangement could not be collected due to unavailability of the occupants in the day time. However, it seems a very workable and cost-effective model for individual male workers migrating to Mumbai from a village. The village membership or connection of the individual acts as guarantee for the Gramastha Mandal.

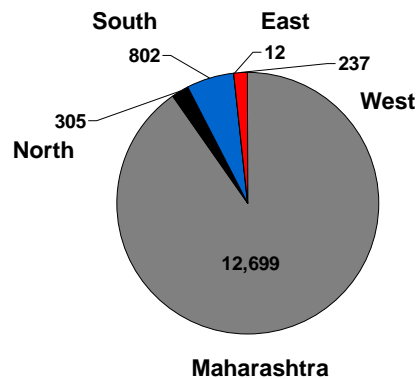
The household survey also indicates that the rooms transferred by some of the original tenants were taken by the neighbouring tenants. That seems to be the reason for some of the households occupying more than one room in the BDD chawls.

### iii. Original place of residence of house holders

Information regarding original place of residence of BDD chawl occupants was collected to understand the background of the community. The data is presented in table no. 14 below.

It is seen from the table that over 90% of residents are from the state of Maharashtra (12,699 households out of total number of 14,055).

**Chart 12: Places of Origin of the Residents**



Regional composition of tenants at the time of allotment in 1920's is not known, however one could reasonably assume that most of the original tenants must have been from Maharashtra and therefore they continue to have the largest number of households. The second largest group is from Andhra Pradesh (4.6%), followed by Uttar Pradesh (2%), Gujarat (1.1%) and Karnataka (0.9%). Population from other states is relatively very small, which can be seen from the table.

**Table 14: Original place (State) of residents of BDD chawl occupants.**

Original state of HH	Worli	N.M.Joshi Marg	Naigaon	Sewri	Total
Andhra Pradesh	607		35	7	<b>649</b>
Bihar	1				<b>1</b>
W. Bengal	2		3	1	<b>6</b>
Delhi	4		10		<b>14</b>
Goa	26	3	6	11	<b>46</b>
Gujarat	111	8	26	8	<b>153</b>
Jharkhand	1			3	<b>4</b>
Haryana	2				<b>2</b>
U.P.	227	7	31	11	<b>276</b>
Karnataka	108	1	10	10	<b>129</b>
Kerala	4		1	3	<b>8</b>
Maharashtra	6,943	2,207	2,743	806	<b>12,699</b>
Punjab	2		1	2	<b>5</b>
Rajasthan	22		5	8	<b>35</b>
Madhya Pradesh	2	1	1		<b>4</b>
Orissa		1	1		<b>2</b>
Tamilnadu	14		2		<b>16</b>
Uttaranchal	2		1		<b>3</b>
Other	3				<b>3</b>
<b>Total</b>	<b>8,081</b>	<b>2,228</b>	<b>2,876</b>	<b>870</b>	<b>14,055</b>

#### d. Economic Conditions of Residents

##### i. Earnings and Incomes

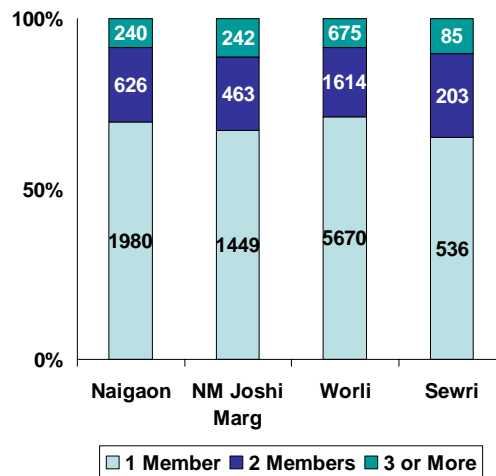
Surveys conducted in BDD chawls collected information about economic condition of the residents. Questions were asked about the number of earning members and income per household, their monthly spending etc. The data is presented in the following tables.

**Table 15: Earning Members and Monthly Income of Households from BDD Chawls.**

No. of Earning members in HH	Worli	N.M.Joshi Marg	Naigaon	Sewri	Total
No earning member	28	33		30	91
1	5,670	1,449	1,980	536	9,635
2	1,614	463	626	203	2,906
3	447	102	161	51	761
4	143	39	46	17	245
5	39	7	18	4	68
6	19	7	5	4	35
7	7	17	5	4	33
8	4	10	2	2	18
9	6	2		1	9
10	5	29		1	35
11	1	9			10
12	1	1	1		3
13		12	1		13
15	1	1		1	3
16	1	1	1		3
18		1			1
20 and more	1	4			5
Pensioners/ retired	3	25	19	10	57
N/A (shop)	91	16	11	6	124
<b>Total</b>	<b>8,081</b>	<b>2,228</b>	<b>2,876</b>	<b>870</b>	<b>14,055</b>

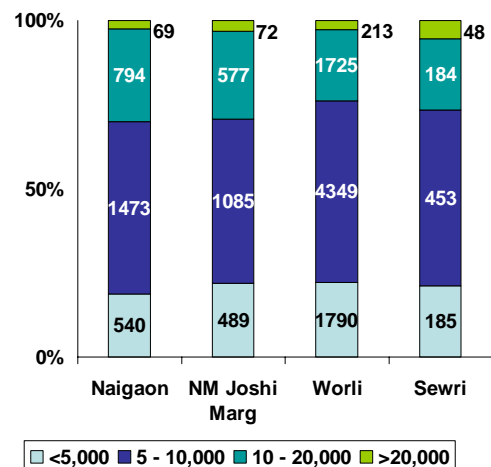
It is observed from the chart below that 9,635 households (around 69%) have only one earning member. Little over 20% households have two earning members. The number of households with three or four earning members is 906 i.e. around 6.5% while 91 households (0.01%) have no earning members.

**Chart 13: Households by Number of Earning Members**



Our study also collected data on the monthly household incomes. This is summarized in Chart 14.

**Chart 14: Income Distribution**



It is seen from the Table 16 below that 52% of BDD families earn income between Rs. 5,000 and 10,000 per month while 23% earn more than Rs. 10,000. Over 21% families have income less than Rs. 5,000 while less than 3% households have income of more than Rs. 20,000 per month.

**Table 16: Average monthly income of the households**

Monthly income (in Rs.)	Worli	N.M.Joshi Marg	Naigaon	Sewri	No. of Households	% to total
Less than Rs. 5,000	1,790	489	540	185	3,004	21
Rs. 5,001 to 10,000	4,349	1,085	1,473	453	7,360	52
Rs. 10,001 to 20,000	1,725	577	794	184	3,280	23
More than Rs. 20,001	213	72	69	48	402	3
No response/N.A	4	5			9	
<b>Total</b>	<b>8,081</b>	<b>2,228</b>	<b>2,876</b>	<b>870</b>	<b>14,055</b>	

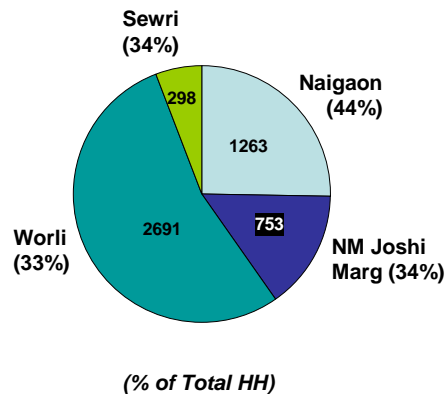
Data about the number of income tax paying households is presented in the following table.

**Table 17: No. of families paying Income tax**

	Worli	N.M.Joshi Marg	Naigaon	Sewri	Total
No. of I.Tax paying HH.	2,691	753	1,263	298	5,005
Total HH	8,081	2,228	2,876	870	14,055
% of Income tax paying households	33	34	44	34	36

It is seen from the above table that 36% households are in the income tax paying bracket. The highest percentage of income tax paying households is 44% and located in Naigaon BDD chawls.

**Chart 15: Number of Tax Paying Households**



Comparing the figures of Income Tax payers and the monthly income per household shown in the Table nos. 16 and 17, contradictions can be noticed. While Table no. 17 shows that 36% of households pay income tax, meaning that their monthly income is more than Rs. 15,000. Only 26% of families show their income more than Rs. 10,000. The families with income of more than Rs. 15,000 should be still less. Besides, family income may comprise of income of more than one person, in which case several families declaring their income even more than Rs. 20,000 p.m. should not be paying income tax. The reason for this could be that people avoid disclosing their true income to outsiders. It can therefore be assumed that the monthly incomes shown in Table 16 above would actually be much higher.

**ii. Ration Card details**

Ration card details also indicate the relative levels of income of families hence data was collected to assess the economic status of BDD chawl households through ration cards as well. Yellow ration card indicates the number of families below poverty line. Orange card indicates that families are above poverty line, while white ration card is allotted to families with income in income tax paying bracket.

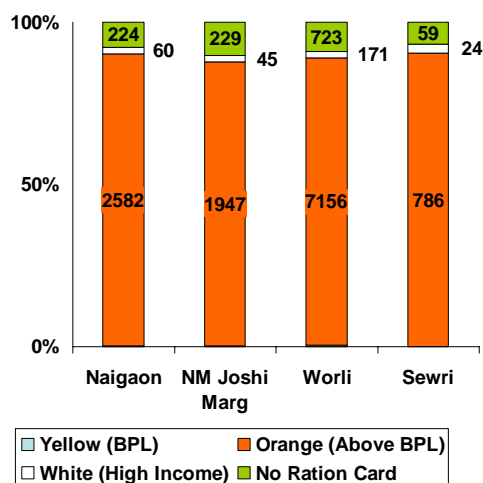
Type of ration cards and number of families holding the type of card is given in the table below.

**Table 18: Status of HH based on the Type of Ration card**

Type of cards held by HH	Worli	N.M.Joshi Marg	Naigaon	Sewri	Total
Yellow (BPL)	31	7	10	1	49
Orange (Above PL)	7,156	1,947	2,582	786	12,471
White (high income)	171	45	60	24	300
No. Ration card	723	229	224	59	1235
<b>Total</b>	<b>8,081</b>	<b>2,228</b>	<b>2,876</b>	<b>870</b>	<b>14,055</b>

The next chart shows only 49 families out of 14,055 are below poverty line. About 8.8% of households (1,235 out of 14,055) have no ration cards. While 300 households (2.1%) are registered with white ration card indicating their status as high income households. This data too contradicts the figures of income tax paying families in these chawls. A large number of families seem to have obtained orange ration cards despite being income tax payers.

**Chart 16: Type of Ration Card Held**



### iii. Rent Paid by Households

The BDD chawls belong to the government. The original rent was fixed at Rs. 13 per month at the time of allotment which was increased over the period to Rs. 17. The rent has not been revised by the PWD since 1940's after the Rent control Act was made applicable in Mumbai. Some of the occupants at present are found to pay rent higher than the original frozen rent. However, the rent deducted by the government for the rooms provided to Police personnel is a certain percentage of their salary and therefore not uniform. It could be the same with MCGM rented buildings. Information about rent paid by tenants was collected during the survey. Data about monthly rent paid by the number of Household is tabulated below.

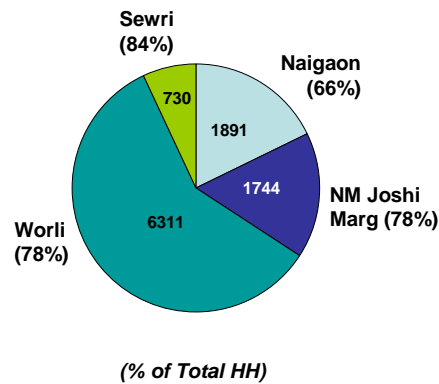
**Table 19: Monthly rent paid by the occupiers and their numbers**

Monthly rent paid by HH	Worli	N.M.Joshi Marg	Naigaon	Sewri	Total
Less than Rs. 100	6,311	1,744	1,891	730	<b>10,676</b>
Rs. 100 to 1000	189	30	101	21	<b>341</b>
Rs. 1000 to 2000	203	251	140	7	<b>601</b>
More than Rs. 3000	1,184	114	729	35	<b>2,062</b>
Not disclosed	194	81	15	76	<b>366</b>
Total no. of HH	8,081	2,228	2,876	870	<b>14,055</b>
% of people paying rent less than Rs 100	78	78	66	84	<b>76</b>

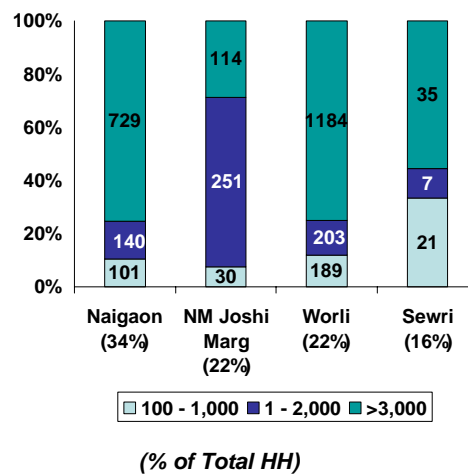
It is seen from the above table that 76% of households are paying less than Rs. 100 per month towards rent. The number of households paying more than Rs. 3,000 as rent per month (2,062 households) is quite large.

The charts below summarize the number of households paying rent less than Rs. 100 per month (majority of which pay Rs. 17 as fixed by the PWD) and those paying more than Rs. 100 per month. These include households that are rented out to police and MCGM.

**Chart 17: Number of Households Paying Rent < Rs. 100**



**Chart 18: Number of Households Paying Rent > Rs. 100**



It could be inferred that such households must be sub tenants of the original tenants. Some of the Gramastha Mandals may also be collecting Rs. 3,000 per month as rent from sub tenants. People paying rent between Rs. 1,000 and 2,000 seem to be employees of the MCGM and police. The rent is deducted from their salaries as a fixed percentage of basic pay. Hence it could be variable and much more than Rs. 100.

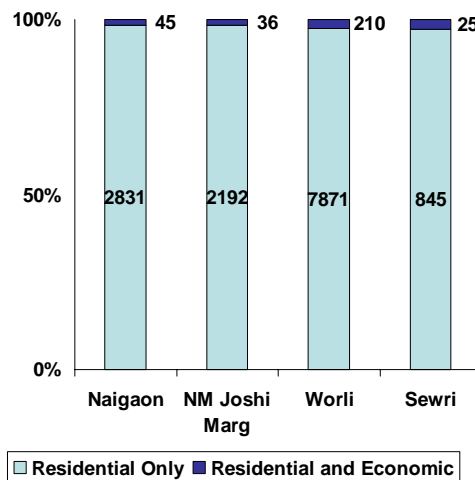
#### iv. Home-based Economic Activity

The survey collected information about use of rooms by the households and the type of use. The findings are presented below

**Table 20: No. of HH which use tenement for additional economic activity**

	Worli	N.M.Joshi Marg	Naigaon	Sewri	Total
Residential Use only	7,871	2,192	2,831	845	13,683
Residential cum commercial use	210	36	45	25	316
Total HH	8,081	2,228	2,876	870	14,055
% of HH with income activity	2.60	1.62	1.56	2.87	2.25

**Chart 19: Economic Activity in Households**



It is seen from the chart that not many rooms are used for any commercial activities by the residents. Just 2.25% or 316 rooms out of 14,055 rooms surveyed were found with some home based economic activities by the occupants. The type of work that was recorded by the respondents was:

- 1) Home based manufacturing – handicraft, stickers, tailoring, book binding
- 2) Food services, *Khanaval*, *Vada pav*
- 3) Retail trade of small goods such as vegetables, fish, flowers, eggs, milk, bangles, cloth, grocery
- 4) Education and training classes
- 5) STD, Communication booth
- 6) Domestic services, courier/ electrical / plumbing / ironing / repairing/ *Pat pedhi* / saloon
- 7) Storage godown etc.

#### **4. RECOMMENDATIONS FOR BDD CHAWLS**

All the BDD chawl structures are located in the heart of the island city of Mumbai and are almost 80 years old. These chawls have completed their life cycle. External infrastructure provided to the buildings, such as, water supply, sewage and storm water drainage has deteriorated and is in need of urgent replacement. The overall condition of BDD chawl buildings is deteriorating and they may not sustain very long under the present condition. A contributing factor is that the maintenance of the buildings is not adequate and is getting expensive with each year.

The rent charged is extremely low and PWD is unable to recover even 50% of that. Therefore major repairs through PWD could not be done. The land value of the locality has appreciated phenomenally in the last 80 years. Therefore the current use of land cannot be termed as efficient and optimum.

In the light of the above observations, redevelopment of the BDD chawls needs to be considered on priority. The findings also support the need for redevelopment expressed in the Housing Policy of the State Government. However, the strategy for the re-development needs to be carefully devised taking into consideration the history of chawls, locational advantage, development pressure, availability of urban amenities, socio-economic condition of existing tenants, very small revenue and high maintenance cost as well as serious shortage of affordable housing in the heart of the city.

## **5. STRATEGIES FOR REDEVELOPMENT OF BDD CHAWLS.**

Considering the size, locational advantages and condition of each locality, a differential policy of development for each locality at Worli, N.M.Joshi Marg, Naigaon and Sewri may be necessary. However, the approach to redevelopment as devised in the following part of the report is general. Two alternative strategies are suggested – development as per DCR 33(9) which has been recently modified to provide for cluster development, and the Dharavi Model, being used for the redevelopment of Dharavi slum area.

### **A. DCR 33(9) Model**

#### **a. Assumptions**

- All the existing tenants will be accommodated in the same locality with a new tenement free of cost on ownership basis only
- The area for the free tenement shall be 27.88 sq.m. or 300 sq. ft. (carpet) consisting of a room, kitchenette and a toilet.
- Area under DP reservations is deducted and net area is considered for built up area calculation based on 4 FSI.
- Roads / RG / PG to be developed by developer
- Existing amenities shall be treated as rehab area
- Density will be maintained at 600 residential tenements / hectare. Hence there will be no residential tenements at Naigaon for free sale.
- Allocation of built up area between MHADA and developer as well as allocation of residential and commercial area shall be as provided in DCR 33 (9).
- MHADA will construct 75% of free sale houses and the developer will construct 25% to maintain a balance between the number of houses and the average size of each house.

### b. Land and built up area

The following table provides details about land, built up area available for redevelopment in each of the BDD chawl localities.

**Table 21: Land and FSI calculations for BDD Chawls**

Location	Plot area in sq. M.	Net area less D.P reservations (sq. m.)	Available BUA with FSI of 4 on net area
Worli	239,000	233,185	932,740
Naigaon	53,900	47,430	210,672*
N.M.Joshi Marg	55,640	54,570	218,280
Sewri	22,900	22,900	91,600
<b>Total</b>	<b>371,440</b>	<b>358,085</b>	<b>1,453,292</b>

*\*FSI exceeds 4 (in this case 4.44) due to high number of existing tenements*

It is seen from the table that maximum built up area available for development of BDD chawls is approximately 14.53 lakh sq. mt. It should also be noticed that the BUA as per prevailing D.C. rules exempts the balcony, staircase and lift areas which are included in the built up area calculations. Hence the actual area of construction will be more than the construction area as calculated here (approx. 42 sq.m. per tenement).

### c. Number of tenements to be constructed

The following tables give the number and size of tenements to be constructed by MHADA and the developer.

**Table 22: Number of Tenements to be Constructed**

Location	Size of Plot	Existing Tenement Density / Ha	Total Rehab Residential Tenements Reqd	Maximum Residential Tenements possible	Additional Tenements
	Ha				
Worli	24	385	9,191	14,340	5,149
Naigaon	5	602	3,246	3,234	0
N.M.Joshi Marg	6	438	2,437	3,338	901
Sewri	2	391	895	1,374	479
<b>Additional BUA for BDD chawls redevelopment</b>	<b>37</b>	<b>425</b>	<b>15,769</b>	<b>22,286</b>	<b>6,529</b>

No additional residential tenements to be constructed in Naigaon because density already exceeds 600 / hectare.

**d. Allocation of available built up area**

**Table 23: Redevelopment under DCR 33(9)**

	Required Rehab Area sq.m. (FSI)	Incentive Area = 80% of Rehab sq.m. (FSI)	Total BUA sq.m. (FSI)	Surplus BUA out of FSI 4 sq.m. (FSI)	2/3 of Surplus to MHADA sq.m. (FSI)	1/3 of Surplus to Developer sq.m. (FSI)
Worli	338,800 (1.45)	271,040 (1.16)	609,840 (2.62)	322,900 (1.38)	215,267	107,633
Naigaon	117,040 (2.47)	93,632 (1.97)	210,672 (4.44)	0 (0)	0	0
N.M.Joshi Marg	89,600 (1.64)	71,680 (1.31)	161,280 (2.96)	57,000 (1.04)	38,000	19,000
Sewri	33,600 (1.47)	26,880 (1.17)	60,480 (2.64)	31,120 (1.36)	20,747	10,373
<b>Total</b>	<b>579,040 (1.62)</b>	<b>463,232 (1.29)</b>	<b>1,042,272 (2.91)</b>	<b>411,020 (1.09)</b>	<b>274,013</b>	<b>137,007</b>

Under this alternative, MHADA will get a constructed area of over 2.74 lakh sq. m. free of cost from the developer which can be sold as affordable houses to beneficiaries under LIG/MIG category.

**e. Allocation of balance Built Up Area for free sale**

Keeping the density of tenements in view (600 residential tenements per hectare), the following table shows the allocation of tenements to MHADA and the developer. However, in the case of Naigaon, additional residential area will not be provided and all the extra area will be allocated for other than residential use to remain within the existing density limit of 602 residential tenements per hectare.

The corresponding size of tenements will be as follows:

**Table 24: Distribution of Tenements between MHADA and Developer**

Location	Agency	Residential Area Available [100% for MHADA, 70% for Developer as per 33(9)]	# of Tenements	Avg Size of Tenement (m <sup>2</sup> )
<b>Worli</b>	MHADA	2,15,267	3,862	56
	Developer	2,65,071	1,287	206
	<b>Total</b>	<b>4,80,338</b>	<b>5,149</b>	
<b>N.M.Joshi Marg</b>	MHADA	38,000	676	56
	Developer	63,476	225	<b>282*</b>
	<b>Total</b>	<b>1,01,476</b>	<b>901</b>	
<b>Sewri</b>	MHADA	20,747	359	58
	Developer	26,077	120	218
	<b>Total</b>	<b>46,824</b>	<b>479</b>	
<b>Total</b>	<b>MHADA</b>	<b>2,86,529</b>	<b>4,897</b>	<b>56 - 58</b>
	<b>Developer</b>	<b>3,53,164</b>	<b>1,632</b>	<b>206 - 282*</b>

*\*282m<sup>2</sup> seems too high. If the ratio of residential and commercial is changed from 70:30 as permissible under DCR 33(9) to 50:50 at Naigaon, the average size will come down to 201 m<sup>2</sup>.*

It is seen from the above tables that approximately 6,529 additional tenements could be added through the redevelopment of the BDD chawls except at Naigaon.

The average tenement area of these additional houses is different for different locations. For MHADA tenements, it would be 56 sq. m. at Worli, 56sq. m. at N.M. Joshi Marg and 58 at Sewri. For tenements built by the developer, it varies from 206 sq.m. to 282 sq.m. per tenement.

It may also be noted that many other alternative scenarios for redistribution of additional areas are possible and that flexibility could be exploited by the potential developer creatively.

**f. Outcome of redevelopment under DCR 33(9)**

- i. Free houses to around 16,000 existing tenants
- ii. Creation of additional stock of 6,529 houses
- iii. MHADA entitled to 2,86,529 sq. m. BUA (approximately 4,897 houses of 56-58 sq.m. BUA) free of cost (valued at Rs. 2,219 crore at the current ready reckoner rate)
- iv. Developer entitled to incentive area of 6,00,239 sq.m. BUA (approximately 1,632 houses of 206-282 sq.m. and commercial area of around 180,072 sq.m<sup>2</sup>) that can be sold in market
- v. Planned development of 37 hectares of area in the heart of the city.

**g. Estimated Notional Revenue Returns under DCR 33(9)**

Under the 33(9) model, the benefit to the government / MHADA will be 4,900 free tenements with a gross BUA of 2.74 lakh sq.m. The approximate value of this BUA at the ready reckoner rate is Rs. 2,219 crore. (The market rate is 2-3 times higher).

**B. DHARAVI MODEL**

**a. Assumptions**

- All the existing tenants will be accommodated in the same locality

- Each existing tenant will be provided with a new tenement free of cost on ownership basis only
- The area for the free tenement shall be 27.88 sq.m. or 300 sq. ft. (carpet) consisting of a room, kitchenette and a toilet.
- Area under DP reservations deducted from available 4 FSI
- Roads / RG / PG to be developed by developer
- Existing amenities shall be treated as rehab area
- Density will be maintained at 600 residential tenements / hectare. Hence there will be no residential tenements at Naigaon for free sale.
- Free sale area to be used 50:50 for residential and commercial
- Ready Reckoner rates used to estimate revenues
- Cost of development is taken as Rs. 28,800 per sq.m.

#### b. Land and built up area

The following table provides details about land, built up area available for redevelopment in each of the BDD chawl localities.

**Table 25: Land and FSI calculations for BDD Chawls**

Location	Plot area in sq. M.	Net area less D.P reservations (sq. m.)	Available BUA with FSI of 4 on net area
Worli	239,000	233,185	932,740
Naigaon	53,900	47,430	210,672*
N.M.Joshi Marg	55,640	54,570	218,280
Sewri	22,900	22,900	91,600
<b>Total</b>	<b>371,440</b>	<b>358,085</b>	<b>1,453,292</b>

*\*FSI exceeds 4 (in this case 4.44) due to high number of existing tenements*

It is seen from the table that maximum built up area available for development of BDD chawls is approximately 14.53 lakh sq. mt. It should also be noticed that the BUA as per prevailing D.C. rules exempts the balcony, staircase and lift areas

which are included in the built up area calculations. Hence the actual area of construction will be more than the construction area as calculated here (approx. 42 sq.m. per tenement).

**c. Number of tenements to be constructed**

The following tables give the number and size of tenements to be constructed by MHADA and the developer.

**Table 26: Number of Tenements to be Constructed**

Location	Size of Plot	Existing Tenement Density / Ha	Total Rehab Residential Tenements Reqd	Maximum Residential Tenements possible	Additional Tenements
	Ha				
<b>Worli</b>	24	385	9,191	14,340	5,149
<b>Naigaon</b>	5	<b>602</b>	3,246	3,234	0
<b>N.M.Joshi Marg</b>	6	438	2,437	3,338	901
<b>Sewri</b>	2	391	895	1,374	479
<b>Additional BUA for BDD chawls redevelopment</b>	<b>37</b>	<b>425</b>	<b>15,769</b>	<b>22,286</b>	<b>6,529</b>

No additional residential tenements to be constructed in Naigaon because density already exceeds 600 / hectare.

### Distribution of Built Up Area

**Table 27: Dharavi Model - Distribution of Area**

Location	Total BUA	Rehab BUA	Free Sale for Developer	Residential 50%	Commercial 50%
	sq.m.	sq.m.	sq.m	sq.m	sq.m.
Worli	932,740	338,800	593,940	296,970	296,970
Naigaon	206,073	117,040	93,632	0	93,632
N.M.Joshi Marg	218,280	89,600	128,680	64,340	64,340
Sewri	91,600	33,600	58,000	29,000	29,000
<b>Total</b>	<b>1,448,693</b>	<b>579,040</b>	<b>874,252</b>	<b>390,310</b>	<b>483,942</b>

#### d. Number and Size of Tenements

**Table 28: Dharavi Model - Number and Size of Tenements**

Location	# of Tenements	Residential Area (50% of free sale)	Average Tenement Size (m <sup>2</sup> )	Remarks
Worli	5,149	2,96,970	58	The developer will have the option of increasing the size of tenements and decreasing their corresponding number
N.M. Joshi Marg	901	64,340	71	
Naigaon	0	0		
Sewri	479	29,000	61	
<b>Total</b>	<b>6,529</b>	<b>3,90,310</b>	<b>58 - 71</b>	

#### e. Cost for Redevelopment

Cost of the off site infrastructure development includes water supply, sanitation, construction of roads, play grounds, amenity open space, electricity, rainwater drainage etc. and is considered at Rs. 3,750/ sq.m. of land area. Cost of construction is taken as Rs. 28,800 / sq.m.

**Table 29: Cost of redevelopment**

Location of BDD chawls	Cost of off site infrastructure devpt	Cost of construction	Total cost of re-devpt	Cost of Temp. Relocation	Overheads / Admin / Contingencies 20 %	Total estimated develop. cost
	Rs. crore	Rs. crore	Rs. crore	Rs. crore	Rs. crore	Rs. crore
<b>Worli</b>	87	2,108	2,195	48	439	2,682
<b>Naigaon</b>	18	476	494	17	99	609
<b>N.M. Joshi Marg</b>	20	493	514	13	103	629
<b>Sewri</b>	9	207	216	5	43	263
<b>Total</b>	<b>134</b>	<b>3,284</b>	<b>3,418</b>	<b>83</b>	<b>684</b>	<b>4,184</b>

As seen in the above table, the total cost of construction is Rs.4,184 crore for a total built up area of 1,453,292 sq.m. Thus the average cost of construction comes to Rs. 28,800 / sq.m.

#### **f. Estimated Revenue Returns**

Under this model, the entire surplus area shall be sold in the open market by the developer. As followed in Dharavi, 50% of this area shall be commercial and 50% residential. The figures of total cost of construction, total revenue generated through sale of surplus area and net returns to the developers are given in the table below:

**Table 30: Estimated Revenue Returns from Dharavi Model**

Location of BDD chawls	Purpose	Area (sqm)	RR Rate Rs./ sq.m.	Expected revenue (Rs. Crore)	Cost of developpt (Rs. Crore)	Net returns (Rs. Crore)
Worli	Commercial	296,970	83,400	2,477		
	Residential	296,970	79,000	2,346		
	<b>Total</b>			<b>4,823</b>	<b>2,683</b>	<b>2,140</b>
N.M.Joshi Marg	Commercial	64,340	131,200	844		
	Residential	64,340	105,000	676		
	<b>Total</b>			<b>1,520</b>	<b>630</b>	<b>890</b>
Naigaon	Commercial	93,632	97,000	908		
	Residential	0	70,100	0		
	<b>Total</b>			<b>908</b>	<b>609</b>	<b>299</b>
Sewri	Commercial	29,000	57,800	168		
	Residential	29,000	57,600	167		
	<b>Total</b>			<b>335</b>	<b>263</b>	<b>72</b>
<b>Total</b>				<b>7,585</b>	<b>4,185</b>	<b>3,400</b>

As seen in the table above, the developer can generate a net revenue of Rs.3,400 crore from the said project at the current ready reckoner rates. The market rates appear to be 2 to 3 times higher than that which means that the actual returns could be in the range of Rs.7,000 crore to Rs.10,000 crore. Even at the ready reckoner rates, the premium expected to be received by the state government can be around Rs.1,700 crore (assuming that 50% of the returns shall be passed on by the developer).

## 6. COMPARISON OF ALTERNATIVES

The outcome of both the alternatives discussed above, from the government's point of view, is summarized below:

	<b>DCR 33 (9) Model</b>	<b>Dharavi Model</b>
1	Return to government shall be <b>in kind</b> – <b>4,900 houses</b> (Value <b>Rs. 2,219 crore</b> )	Return to government shall be in cash – around Rs. 1,700 crore
2	Return may vary, depending on the market rate and <b>sale price</b> fixed by MHADA. (MHADA normally sells at rates much lower than the market rates)	Return will be quoted in the bid itself and therefore be a <b>fixed amount</b>
3	Return will come <b>after sale</b> of tenements by MHADA	Return will come <b>upfront</b> from developer while construction goes on.
4	<b>6,529 additional tenements</b> shall be constructed	Number of tenements could be <b>much less</b> as the developer will prefer to construct larger houses for sale
5	Around <b>4,900 LIG / MIG</b> tenements will become available to MHADA	Developer <b>unlikely</b> to construct LIG / MIG tenements
6	<b>Less transparency</b> in selection as developer shall be selected on the basis of 70% consent of the tenants	<b>Fully transparent</b> selection through open bids.

## **7. CONCLUSION**

The redevelopment of BDD chawls is a large and complex task involving the rehabilitation of more than 16,000 tenements. The task may face opposition from many stake holders, especially current occupants, social and political activists, different public organizations and utility providers. In addition, financial and environmental considerations have to be managed in the design of the project. The size of the project and need for efficient design and completion of the project poses significant challenge for the agency handling the task. This further underlines the need for careful planning and speedy execution capable of handling unexpected road blocks. Transparency at all phases of the project will ensure the success and could provide model for future cluster development projects in Mumbai and other cities.

Both the models of redevelopment discussed above have their pros and cons. The final decision needs to be taken carefully after taking the stakeholders into confidence so that none of them becomes a hurdle at the time of implementation of the project.

# **A N N E X U R E**

## **D R A W I N G S**