

Vulnerability Assessment of Disaster Related Risks in Perumbakkam





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Disaster Related Risks:

Impacts of 2015 Floods: Discussions with the residents of Perumbakkam resettlement site reveals that the settlement is vulnerable to floods and cyclone. Narrating the 2015 flood experiences, residents pointed out that almost more than half of the ground floor (5 to 6 feet) was submerged and therefore there was no way to evacuate to another area during the floods. Those who were residing in the ground floor moved to the first floor and sought refuge from other houses.

Some of the families lost their electronic appliances because there was no time to shift their belongings. Because of the poor quality wiring in the buildings there were electricity fluctuations for days and many lost their electronic appliances also because of these fluctuations.

Many women pointed out that during rains the entire walls are damp and it is difficult to stay inside the house. The children fell sick because of these damp walls and non-availability of safe drinking water facilities. They did not have electricity and clean water facility for 3 to 4 days till the water receded. Because of the floodwater and lack of electricity the elevators were not in working conditions and hence people's mobility was restricted during the disaster. Men and women were unable to go for work for over 10 days.

"We were shifted from Tambaram the floods that took place in the month of November 2015 stating that we are being evicted to be safeguarded from floods. Only to realize that Perumbakkam was also flooded within a week after we were shifted."

Impacts of 2016 Cyclone: During Vardah Cyclone there was flooding upto 3 feet. One of the biggest issues that they faced apart from flooding was absence of electricity and water supply for over a week. Unavailability of drinking water was one of the biggest issues. Because of the floodwater and lack of electricity the elevators were not in working conditions and hence people's mobility was restricted during the disaster. Discussions reveal that water did not recede in many spots inside the settlement for over a week.

During Vardah, because of the strong winds, the open windows in many houses were blown away, some of these windows are not fixed till date. Many drainpipes were also broken because of the cyclone. As none of the widows, or grills in the buildings have sunshades the rain water seeps inside the house and there is half feet of water in the corridors in all the floors, especially when it rains heavily. The families also point out that because of the leaking pipes, the houses are damp throughout the year and the conditions are worse when it rains. "We were shifted because they wanted to restore a river, but they provided houses in another water body that is also an area of importance. To save one water body is it right to sacrifice another? We were told that is area is safe only to realise that foxes were roaming free in the settlement, hunting our cattles".

Discussions with communities also reveals that Perumbakkam was flooded because the site is surrounded by different water bodies and the area in which the site is located used to be the location were excess water from the nearby lakes drained during monsoons.



They pointed out that in the name of restoring a water body and preventing flooding and damage they were shifted to another spot that is equally ecologically sensitive.

Violation of Building Code Norms that renders the buildings unsafe during natural and human made disasters:

An affidavit submitted by Mr K. Sudhir (a practicing architect with 32 years of experience) in a public hearing on 'Impact of Flood on Chennai Slum and Pavement Dwellers'¹ reveals that there are two different types of designs of houses in Perumbakkam. The Type A design has 32 blocks, each with 24 units per floor and a total of 192 dwelling units per block, housing about 750 individuals. The Type B design covers 156 blocks, each with 12 units per floor and 96 dwelling in each block,

¹ The public hearing on 'Impact of the Flood on Chennai Slum and Pavement Dwellers' was

housing about 380 individuals. In Type A housing, each of the 32 blocks has been provided with two lifts and two stairways arranged around the lift shafts.

Discussions with the affected communities reveal that in Type A housing, there are two sets of staircases, 2.5 metres wide. The narrow staircases are inconvenient for most people to access. The staircases in this type of building cannot be used during a fire because of their position around the lift duct. There are no emergency exits in the buildings, and in case of a fire or earthquake, it would be very difficult for residents to use the narrow staircases as escape routes.

In Type B housing, each of the 156 blocks has been provided with one lift and two stairways, of which one is arranged around the lift shaft. Residents reveal that during an emergency situation, nearly 380 people would have to use these two staircases to escape. The communities point out that they were relocated under the guise of 'safety' but the houses provided to the disaster-affected persons are not disaster-resilient. The affidavit submitted by Mr. K. Sudhir also points out that, "Fire and Life Safety provisions of the National Building Code of India, 2005 prescribe the standards to ensure safe exit during a fire emergency. Type A and Type B designs fail on all counts with respect to the minimum aggregated exit width required in the ground floor (5.8 and 6 metres provided instead of 12.8 and 6.4 metres stipulated), minimum exit width for stairways given the occupancy (zero effective width of 1 metre provided instead of 1.2 metres mandated) and the maximum travel distance to an exit from the furthest point of the floor (34.3 metres and 21.5 metres provided against a maximum of 30 metres). Both Type A and B deploy staircases around lift shafts, which is forbidden by the code under Section 4.9.3. In view of this prohibition, the 32 blocks of Type A have zero-exit width availability in case of a fire in these buildings, putting in risk the lives of over 30,720 people who will eventually occupy the 6,144 tenements in them. As for the remaining 156 Type B blocks, one of the two staircases provided in each block is invalidated for the same reason and only one dog-legged eight-floor high staircase remains with an effective exit width of 83% of the minimum required, to service the emergency escape needs of over 480 people."

The violation of National Building Code (NBC) norms has been one of the issues raised by civil society organizations and also by the office of the Comptroller and Auditor General of India (CAG) in its audit report (General and Social Sector) for the year ended 31 March 2014.²

In reference to the Perumbakkam housing scheme, the CAG report states that, "The extent of land allotted to TNSCB for Perumbakkam project was 81.20 hectares. Maximum dwelling units permissible in the project area as per the National Building

² Report of the Comptroller and Auditor General of India, General and Social Sector for the year ended March 2014, Government of Tamil Nadu, Report Number 3 of 2015. Available at: https://www.cag.org.in/sites/default/files/database/CAG%20Report_TNSCB_0.pdf

Code of India (NBC) norms were 12,180 hectares only. However, construction of 23,864 dwelling units was proposed with a density of 294 dwelling units per hectare thereby causing congestion at the site, which resulted in public criticism and prompted GoTN to change location for 3,488 units. Even considering construction of 20,376 tenements in the site, the density would be 251 units per hectare, which exceed the norms of the NBC."

TNSCB has, thus, violated standards of the National Building Code of India and has constructed tenements that would lead to congestion, thereby threatening safety of residents.

Buildings are unsafe: Communities pointed out that the houses constructed are of poor quality and that these houses are not safe during disasters. The vulnerability assessment undertaken as part of this initiative also reveals that 82 per cent of the surveyed house has one or more infrastructure related issues.

Types of Issues	C Block	D Block	E Block	Total
Cracks	0	2	10	12
Cracks, Poor quality flooring	1	1	0	2
Crumbling plasters	1	0	0	1
Crumbling plasters, Electrical wiring issues, Cracks	0	0	1	1
Damp walls	7	12	25	44
Damp walls, Cracks	4	8	10	22
Damp Walls, Poor Quality Flooring	6	0	0	6
Damp walls, Cracks, Poor Quality Flooring	1	0	0	1
Electrical wiring issues	0	1	0	1
Damp walls, Electrical wiring issues	0	1	2	3
Damp walls, Electrical wiring issues, Cracks	0	0	4	4
Damp walls, Electrical wiring issues, Poor quality flooring	0	0	1	1
Poor Quality Flooring	5	0	0	5
Electrical wiring issues, Cracks	0	0	2	2
Electrical wiring issues, Cracks, Poor quality flooring	1	0	0	1
Water leakage	0	2	2	4
Water Leakage, Cracks	5	2	0	7
Water leakage, Damp walls	16	43	22	81
Water leakage, Damp walls, Cracks	8	53	28	89
Water leakage, Damp walls, Poor quality flooring	14	0	0	14
Water leakage, Damp walls, Cracks, Poor quality flooring	16	3	2	21
Water leakage, Damp walls, Electrical wiring issues	2	1	1	4
Water leakage, Damp walls, Electrical wiring issues, Cracks	4	6	5	15
Water leakage, Crumbling plasters, Damp walls, Electrical Wiring Issues	14	1	0	15

Types of Infrastructure Issues (Housing)

Water leakage, Damp walls, Electrical wiring				
issues, cracks, Poor quality flooring	1	0	1	2
Doors not fixed properly, Damp walls, Poor quality				
flooring	1	0	0	1
	107	136	116	359

Demands from Communities:

- Government to take up action to ensure prevention of flooding in the site
- Effective storm water drain to ensure that the water does not stagnate in the site
- Some designing to ensure that during rains the water does not stagnate in the corridors in all floors

Recommendations from Researchers:

- Link "water as leverage programme" in Perumbakkam for effective water management planning and implementation
- Technical audits to assess the stability of housing
- Technical designs to ensure that the houses are disaster resilient and can be implemented to reduce the risks in these site
- Emergency exits are required for evacuation during earthquakes or fire accidents.



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