

# MaS-SHIP

Mainstreaming Sustainable  
Social Housing in India Project

## Resident perceptions of living conditions in a social housing development located in the temperate climate of Bangalore

October 2018

### Summary

The construction of 12 million social housing units under the Government of India's *Housing for All* by 2022 scheme, presents an opportunity to inform the design, performance and specification of these units, from the experiences of residents inhabiting such developments. As part of the MaS-SHIP project, field study was conducted in five social housing developments across three climatic zones of India. The purpose of the questionnaire-based survey study was to gather subjective feedback from residents about their perception of the overall living conditions related to indoor environmental conditions in their homes, familiarity with the building materials, maintenance, upkeep and access to day-to-day amenities around the development. This document describes the learnings from one of the field surveys of 155 households in a social housing development (Laggere colony), located in the temperate climate of Bangalore (Karnataka).

## Key findings

### 1. External weather is mild, but indoor environment was perceived to be just bearable.

Despite the moderate weather conditions throughout the year (*Temperature- avg. max = 32°C; avg. min = 17°C, Avg. RH= 77%*), majority of the surveyed residents perceived indoor temperature and air quality to be (just) *bearable* during summer and winter. There was only marginal increase in the number of households satisfied with indoor temperatures in the winter as compared to the summer. Interestingly during winter the number of households perceiving indoor air quality as 'fresh' was found to be lesser as compared to summer. Due to the marginal difference in the external temperatures between the two seasons (summer and winter) the householders' overall perception of the indoor environment largely remains similar (Figure 1). The findings imply the inability of the building envelope to provide comfortable indoor environment throughout the year despite external weather being mild.

Figure 1: Perceived indoor temperature

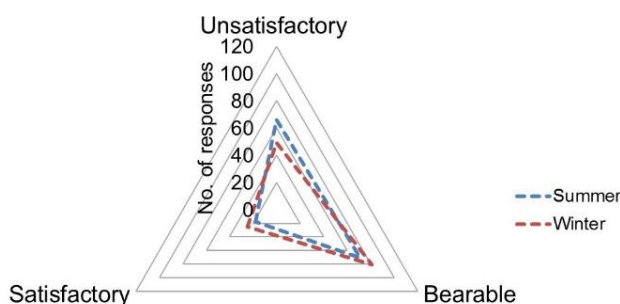
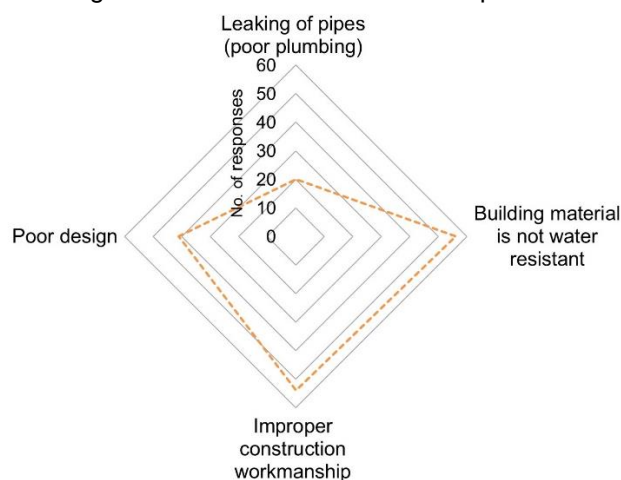


Figure 2: Perceived causes of dampness



Though each space(room) in a dwelling had been provided with window/s, these were located only on one external façade of the building, thereby restricting cross ventilation. Despite this the residents

perceived indoor air to be well-ventilated during summer and winter. Natural ventilation using openable windows along with ceiling fans formed the suite of adaptive measures adopted by the residents for achieving indoor comfort. The use of air-conditioning was not found to be prevalent, due to the high energy costs associated with its use. Indoor air movement was found to be a key factor in influencing the residents' overall experience of the indoor environment, indicating the need to incorporate strategies for cross ventilation and passive cooling in social housing design, so that comfortable indoor environment is maintained at no or low cost.

## 2. Quality of construction was found to be poor

The materials and construction techniques used may be cost effective but were found to be unsuitable for the climatic conditions. Bangalore experiences heavy rainfall during the monsoon season (May to Oct). Householders living on the upper floors complained of dampness due to rain water seepage from the roof and external walls and attributed it to *improper workmanship* and *building materials not being water resistant* (Figure 2). Although Building Byelaws require a minimum quality of construction, appropriate site checks need to be put in place by developers and urban local bodies to ensure that construction quality is not compromised. Well-constructed dwellings will tend to be more durable and have lower maintenance costs that are vital for social housing developments, inhabited by Economically Weaker Sections (EWS) or Lower Income Groups (LIG) groups. Good quality of construction and workmanship would also enhance residents' health and safety (in case of natural disasters) and liveability of these developments.

## 3. Residents were satisfied with the building materials overall but dissatisfied with the lack of nail-ability of the walls

Despite the poor quality of construction, majority of residents were satisfied with the building materials (RCC frame structure & Solid concrete block walls) overall. Nevertheless, about 60% of the households expressed dissatisfaction with the lack of 'nail-ability' of the walls and the difficulty in adding or changing electrical points (Figure 3). This reveals the significance of designing social housing units that can be adaptable by offering residents the ability to make changes in their own housing units.

Figure 3: Householders experience with the building materials used

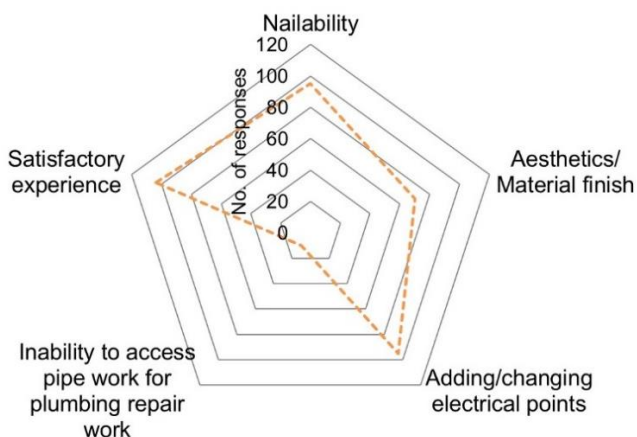


Figure 4: View of a street in Laggere colony



## 4. Incomplete road works and poor drainage system not only posed health risks but also affected daylighting inside

Open drains and absence of a cleanliness regime led to water-logging and garbage littered along the streets of the development. The incomplete road works added to the problem of water logging during monsoon season, providing active breeding ground for mosquitoes posing hygiene and health issues for the residents (Figure 4). This also affected the daylighting in the homes, since the residents were forced to keep their windows closed to avoid mosquitoes from entering their homes.

Cleanliness and upkeep of the development and its surroundings is not only important for the health and well-being of the residents, but also for the appropriate use of passive design strategies, such as opening of windows and ventilators. While establishing an active institutional system, will help in maintaining a clean and healthy environment; design for maintenance must be incorporated at the planning stage of a social housing project. Provisions of appropriate infrastructural and institutional arrangements, to ensure timely and sustainable disposal of different forms of waste that are generated in the development should be provided.

### **5. Access to basic amenities was good but safety seemed to be a concern**

The Laggere housing colony is located approximately 13 km away from the city centre. The residents of the development have good access to their places of work, as well as to amenities such as schools, hospitals and market places. Access to public transport was found to be good. Some residents expressed concern regarding the safety especially at night.

### **6. Electricity meters should be installed in every household**

All the surveyed households used electricity, but only 41% of them paid for their use. The remaining 59% of the surveyed households did not have electricity meter installed in their homes and hence did not pay any electricity bills. Measuring electricity used by each household is the first step for households to manage their energy use.

### **7. Conclusion**

This study has revealed for the first time, resident perception and experiences of inhabiting a sustainable social housing development. The findings reveal that the quality of indoor environment, quality of the interiors, ability to make changes and the maintenance and up-keep of the surroundings are important factors in determining the level of 'satisfaction' of the residents. These factors must be taken into consideration in the planning, design, specification and performance of social housing developments, so that they are truly sustainable and liveable for the residents.

 <p><b>MaS-SHIP</b></p> <p>Mainstreaming Sustainable Social Housing Project in India (MaS-SHIP) is a two-year research developed to promote sustainability in terms of environment performance, affordability and social inclusion as an integral part of social housing. Funded by United Nations Environment Programme (UNEP) 10 Year Framework of Programme on Sustainable Consumption and Production (10YFP).</p>	<p><b>Contacts</b></p> <div style="display: flex; justify-content: space-around;"> <div data-bbox="829 1612 1037 1702">  <p>Prof. Rajat Gupta (Project lead) <a href="mailto:rgupta@brookes.ac.uk">rgupta@brookes.ac.uk</a></p> </div> <div data-bbox="1181 1612 1340 1702">  <p>Sanjay Seth <a href="mailto:sanjay.seth@teri.res.in">sanjay.seth@teri.res.in</a></p> </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div data-bbox="790 1825 1061 1915">  <p>Zeenat Niazi <a href="mailto:zniazi@devalt.org">zniazi@devalt.org</a></p> </div> <div data-bbox="1133 1848 1412 1915">  <p>Jesus Salcedo <a href="mailto:jesus.salcedo@un.org">jesus.salcedo@un.org</a></p> </div> </div>
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