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Aspirations and Lived Experience in Contemporary Housing: Environmental Comfort and Sustainability in Delhi NCR

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Abstract

Sustainability has become one of the most pressing concerns of the twenty-first century as rapid urbanisation and increasing consumption continue to place immense pressure on natural resources. In a country like India, where cities are expanding at an unprecedented pace, creating environmentally responsible urban communities has become essential. This concern is reflected in Sustainable Development Goal 11, which emphasises the need to build sustainable cities and communities. In the context of Delhi NCR, where high-rise residential developments are often marketed as modern and sustainable, it becomes important to understand whether these claims align with the everyday experiences and practices of residents. While existing studies largely focus on architectural design and large-scale policy initiatives, less attention has been given to the role of individual households and community-level participation in achieving sustainability. This study aims to examine how residents of Ireo Victory Valley, a high-rise residential complex in Delhi NCR, perceive and practise sustainability in their daily lives. A mixed-method approach was adopted for the study. Primary data were collected through a structured survey conducted among 40 residents of Ireo Victory Valley, while secondary sources provided broader contextual understanding of sustainable housing practices. The findings reveal three key themes. First, residents rely heavily on technology such as air conditioners and air purifiers to maintain comfort, indicating that everyday well-being often depends more on technological fixes than passive design. Second, there exists a noticeable gap between the sustainable features promised by housing developments and the lived experiences of residents, who continue to desire improvements such as rooftop solar systems, rainwater harvesting, and better ventilation. Finally, although residents demonstrate awareness of sustainability issues and express a willingness to support environmentally friendly initiatives, their participation is influenced by practical considerations such as affordability and visible benefits. The study highlights that sustainability in urban housing is not determined by infrastructure alone but by the interaction between design, governance, and resident practices. Strengthening community initiatives, improving maintenance and implementation of sustainable measures, and encouraging greater resident participation can help bridge the gap between sustainable intentions and everyday realities.

Keywords: *Urban Housing; Sustainability; Infrastructure; Delhi NCR; Collective Efforts*

Introduction

Delhi NCR, a growing urban area, has changed a great deal over the past few years. The housing in this region is usually never built with a focus on environmental comfort and sustainability. Due to scarcity of land, buildings have been built close to each other and are enclosed on most sides by walls, which blocks sunlight, since there are not many windows, and restricts airflow as well. Because of this, residents rely on air conditioning and lighting, which impacts environmental comfort. Most homes struggle with similar problems relating to ventilation, natural light, thermal comfort, and noise. These issues have become very common, due to the more frequent heat waves in Delhi NCR in recent years. Such issues were also recognised by other researchers in previous studies. Singh and Chani (2018) conducted a study in which they observed that the thermal comfort of people living in naturally ventilated multi-storey apartments in the composite climate of India depends on floor level, season, and building type. These observations show that the design of apartments is one of the key factors determining the comfort of the indoor environment. Nevertheless, this study was mainly concerned with thermal comfort, while the present study looks at environmental comfort as a wider concept. The gap between what is expected of housing designs and what residents actually experience is what this research seeks to examine.

This research is based in Delhi NCR, specifically in an apartment complex in Gurgaon, Ireo Victory Valley. The research focuses on the living experience of people on different floors, in order to understand the impact of the design of

high-rise apartments in Gurgaon. The closely arranged vertical structures, as well as the limited number of windows in these high-rise apartments, have raised concerns regarding the lack of sunlight and ventilation. Similarly, Manu et al. (2016) revealed that indoor environmental factors such as ventilation and building design have significant impacts on the thermal comfort of occupants across different climates of India, and that climate-based building design is important. This increases temperature and dampness during monsoons in the apartments, which may lead to mould or damage to furniture, and allergies within the apartment. The World Health Organization (2018) also shows that the presence of dampness and poor ventilation indoors is linked to respiratory ailments, allergic reactions, and overall poor health status. This is an important sociological problem, since the living experience in flats is related to the health and lifestyle of people living in such apartments. The lack of environmental comfort in these apartments, despite attempts to incorporate sustainability, is a cause for concern, which makes this issue important.

This research paper examines how residents of these high-end housing complexes experience environmental comfort in their day-to-day lives, taking into account ventilation, natural light, thermal comfort, noise, and pollution control. Along with that, the paper explores how the incorporation of sustainability into these housing designs collides with residents' needs, experiences, and aspirations. By interacting with architects, builders, and RWA members, the concepts of sustainability and comfort, and how applicable these designs are within current modular housing designs, are examined. This helps identify the gaps between what architects intend with their sustainable designs and the actual use, maintenance, and experience of housing spaces.

Literature Review

The topic of sustainable housing has become increasingly important in recent years, especially as urbanisation continues to be a major issue around the globe. Various nations have implemented different policies concerning sustainable housing in line with their climatic, cultural, and economic backgrounds. A good example of such research is Glicksman and Lin's (2007) study, “Sustainable Urban Housing in China: Principles and Case Studies for Low-Energy Design”, which explores the design of energy-efficient buildings in growing Chinese metropolises including Beijing, Shanghai, and Shenzhen. This study shows that sustainable housing depends on more than just advanced technology; it also involves design elements such as natural ventilation, daylighting, and optimal building orientation. Furthermore, the authors stress the importance of incorporating traditional Chinese architectural elements into current urban housing solutions to enhance air circulation. It is evident from their conclusions that sustainability is most successful when environmental factors are incorporated at the design stage. Chavan and Chandar (2022) show how traditional Indian houses already use sustainable design elements that have developed over time based on regional environmental factors. Through simulation and field research, the researchers found that the use of courtyards, verandas, thick walls, shading elements, and double roofs helps maintain thermal comfort while still allowing for adequate ventilation and lighting. The houses and residential areas referred to in this research managed to maintain thermal comfort throughout the summer months without relying heavily on artificial cooling systems.

However, given the current ecological scenario, the need for sustainable housing in India has become extremely urgent because of the fast pace of urbanisation, growing population, changing climate, and ecological damage. According to Pasupuleti (2024), sustainable housing should incorporate climate-responsive design alongside green infrastructure and effective management systems. The study outlines features such as green roofs, wetlands, and permeable surfaces that contribute to cooling, stormwater management, and air purification, suggesting that sustainable housing depends on the interaction of building components, infrastructure, and governance systems. Likewise, Roy and Sarif (2023) demonstrate that low-income households tend to reside in less resilient homes with inadequate provision of amenities such as clean water, sanitation, and electricity, and highlight that even within large cities, housing standards can differ greatly depending on location.

While greater awareness is being given to sustainability, its implementation in housing continues to be affected by numerous social, infrastructural, and economic challenges. One major concern is the perception of affordability and sustainability as competing objectives. Banerjee and Mandal (2025) identify multiple impediments to success, including the high cost of construction, the absence of proper policy support, a lack of cooperation among stakeholders, and poor maintenance after completion. They also note that project failures are often caused by the delay in introducing sustainability considerations at an early stage of development, rather than incorporating them from the outset. A related

concern is the wider systemic dependence of sustainable housing on other infrastructures. Silva (2024) emphasises that sustainable housing relies heavily on the availability of transport, energy, water, and waste-disposal infrastructure. In many rapidly urbanising contexts, such as India and China, these infrastructural systems remain underdeveloped, producing notable social disparities in access to comfortable living space and amenities. Economically, while advances in green technology and material availability continue, affordability remains a persistent barrier.

There have not been many studies specifically devoted to sustainable housing in the Delhi NCR region. Existing studies, while focusing on the environmental dimensions of sustainability, tend to lack a holistic sociocultural perspective on living within sustainable housing. This study therefore also intends to advance the discussion on individual and community action in creating more sustainable residential areas.

Methodology

The study employs a mixed-method approach that emphasises qualitative methods based on a phenomenological framework. Phenomenology is concerned with how experience is structured and how consciousness is directed towards a subject in the real world (Stanford Encyclopedia of Philosophy, 2003), and it is used here to reveal the social significance of comfort and sustainability within high-rise housing infrastructure. The study was conducted in Delhi NCR, specifically in a prominent high-rise apartment complex, with a focus on selected high-end gated and contemporary modular apartment complexes, since these portray a combination of climatic and pollution pressures alongside rapid growth in the modern and green housing markets. The study involved approximately 20–30 adults living in Ireo Victory Valley, aged 25–65 years, of both genders, comprising owner-occupiers and long-term tenants. The sample was drawn primarily from upper-middle and upper socio-economic groups, given the nature of the housing segment. Participants were selected from among the residents of Ireo Victory Valley using a purposive sampling technique with maximum variation wherever possible (for example, across floor levels, orientation, dependency on air conditioning or air purifiers, and length of residency). Purposive sampling involves choosing participants intentionally on the basis of relevant traits or experience (SAGO, n.d.).

Surveys were used to gather data, administered through a Google Forms questionnaire. The survey received 40 responses, all from residents of Ireo Victory Valley, and data collection took place over a period of two to three weeks. Thematic analysis, a technique used to analyse qualitative data by identifying, analysing, and interpreting patterns within a data set (Ahmed, 2025), was used to analyse the data (for example, comfort and discomfort, trust in green claims, aspiration, and everyday adaptation). Survey results are presented using Microsoft Excel, and data cleaning and analysis were carried out manually.

No vulnerable or endangered group was included among the study participants. The research took place within a private residential setting and adhered to the principles of informed consent, voluntary participation, minimal invasion, and appropriate gatekeeping. Confidentiality was maintained through the anonymisation of names and the removal of personal identifiers (such as complex names, flat numbers, and roles), the use of pseudonyms, the secure storage of recordings and transcripts, and the reporting of findings in aggregated form. Participants also had the option to withdraw from the study at any time.

Discussion and Analysis

Environmental Comfort and Everyday Dependence on Technology

This theme analyses how residents experience sunlight, ventilation, heat, pollution, and indoor air quality in high-rise housing. Survey data on floor level, hours of natural light, and air conditioner and air purifier usage indicate whether residents' comfort depends more on building design or on technological fixes. Where many respondents report low natural light alongside long hours of AC or purifier use, this suggests that the housing structure may be marketed as modern or sustainable, yet everyday comfort continues to rely heavily on energy-consuming appliances.

Based on the survey dataset of 40 residents, the findings indicate that environmental comfort in the residential complex is only partially supported by passive design features and remains strongly dependent on technological interventions. Although a majority of respondents reported receiving some natural daylight, only 20% receive 7–9 hours of sunlight daily, while 80% receive 6 hours or less. In particular, 37.5% of residents receive only 1–3 hours of natural light per day, suggesting limitations in daylight penetration and building orientation.

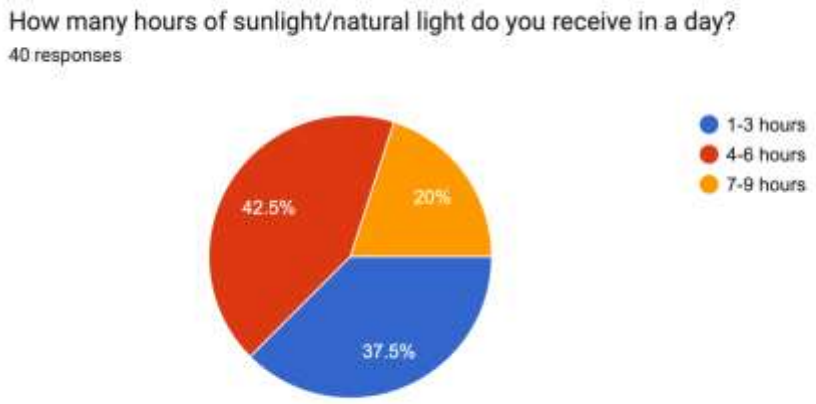

Figure 1. Hours of natural light received per day (n = 40).

This reduced reliance on natural environmental conditions is further reflected in appliance usage patterns. Air-conditioning use is particularly high, with 67.5% of respondents operating their AC for more than 7 hours daily during the summer months, including 20% who use it for over 10 hours per day. Similarly, air purifiers are widely used, with 37.5% of residents running them for 7 hours or more per day, and 22.5% using them for over 10 hours daily during the pollution season.

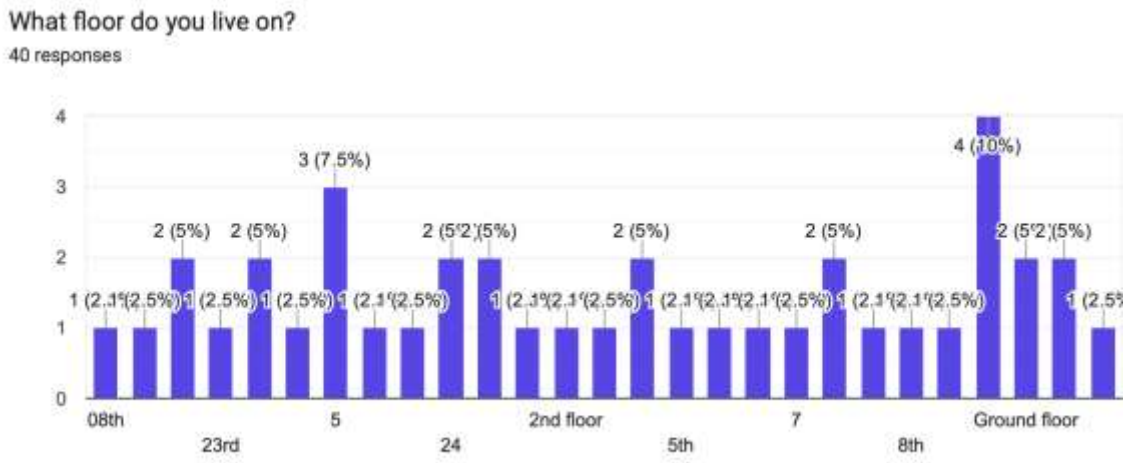

Figure 2. Distribution of respondents by floor of residence (n = 40).

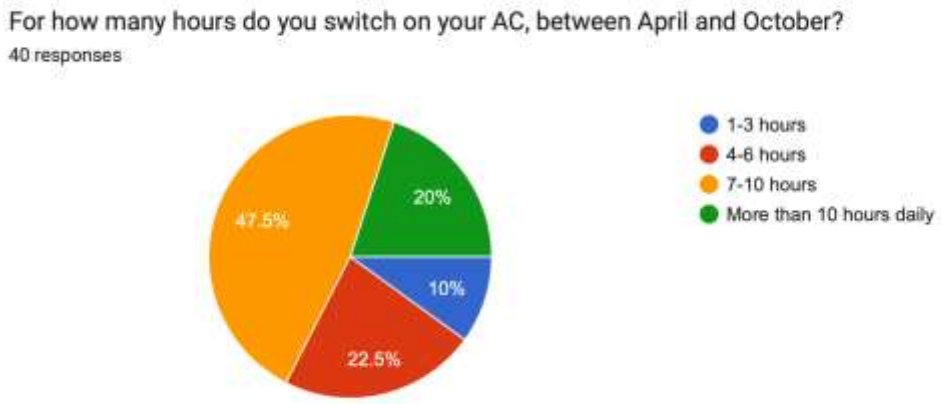

Figure 3. Hours of air-conditioner use, April to October (n = 40).

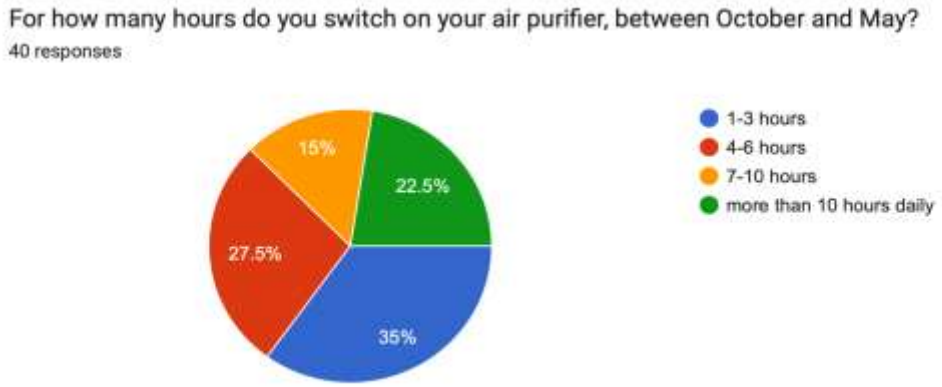

Figure 4. Hours of air-purifier use, October to May (n = 40).

Figure 5. Presence of indoor or outdoor plants in the flat (n = 40).

The results suggest that despite residing in a modern high-rise environment, residents frequently depend on energy-intensive technologies to maintain acceptable indoor comfort and air quality. This raises questions about the effectiveness of the built form in providing adequate natural ventilation, thermal comfort, and protection from outdoor pollution. While

the development may embody contemporary housing ideals, residents' everyday experiences indicate that comfort is often achieved through mechanical systems rather than passive environmental design strategies.

Gap Between Sustainable Housing Design and Lived Experience

This theme examines the difference between what sustainable housing promises and what residents actually experience. Survey questions on solar panels, natural light, ventilation, and desired features such as rainwater harvesting, wastewater reuse, rooftop solar, green shade, and low-VOC paints help identify what residents feel is missing. This directly supports the paper's argument that sustainability cannot be judged only by architectural intention or marketing, but must be studied through everyday use, maintenance, and resident satisfaction.

A central argument of this research is that there may be a gap between the sustainability goals of residential developments and the actual experiences of residents.

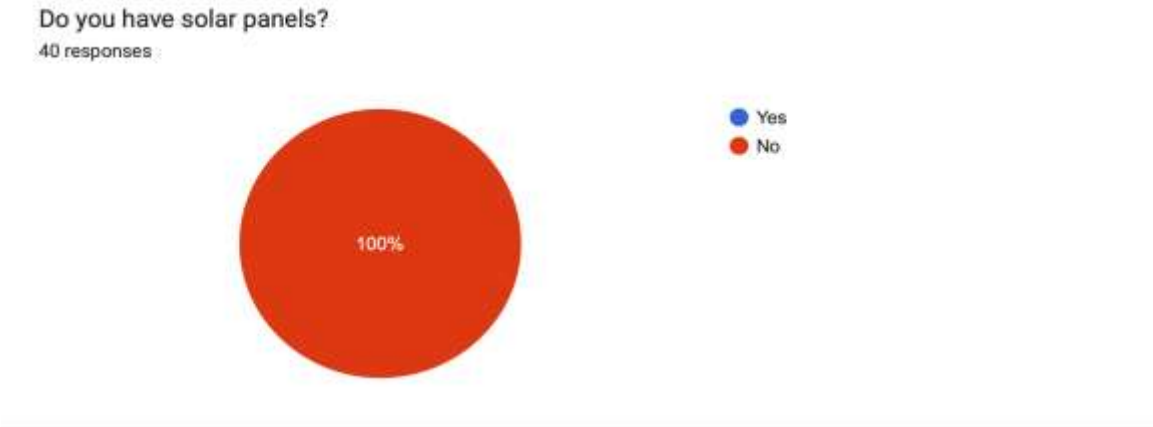

Figure 6. Presence of solar panels in the residential building (n = 40).

This gap becomes evident when examining the availability of sustainable infrastructure. Notably, none of the respondents reported having solar panels in their residential buildings. This is significant because rooftop solar energy is widely recognised as one of the most effective renewable energy solutions for urban housing. The complete absence of solar panel adoption indicates that sustainable technologies are either unavailable, inaccessible, or not prioritised within these housing complexes.

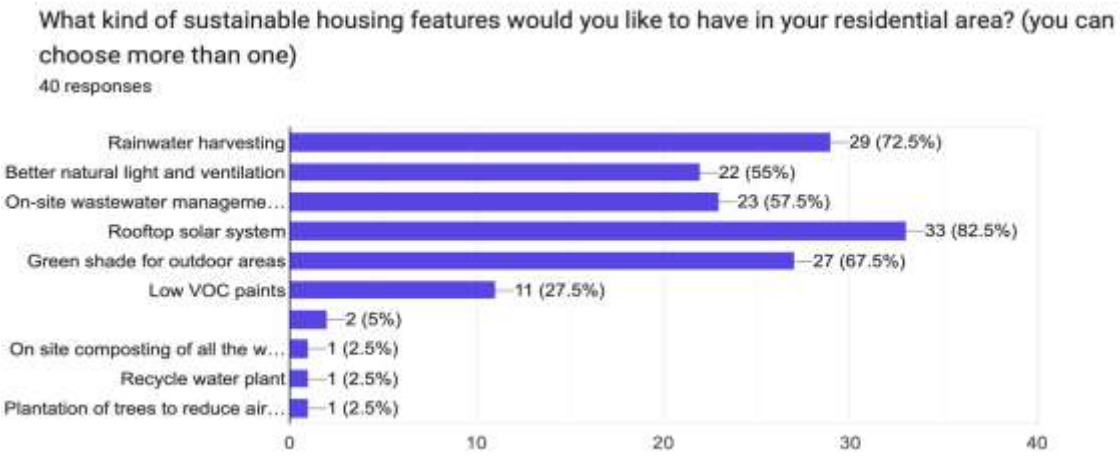

Figure 7. Sustainable housing features residents would like to have (n = 40; multiple responses permitted).

The survey also explored which sustainable features residents would like to see in their communities. The most desired feature was rooftop solar systems, selected by 82.5% of respondents. Other highly preferred features included rainwater harvesting (72.5%), green shaded outdoor areas (67.5%), on-site wastewater management and reuse (57.5%), and better

natural light and ventilation (55%). These preferences reveal that residents perceive several important sustainability measures to be currently lacking in their living environments.

The desire for improved natural light and ventilation is particularly important because it directly relates to the high levels of air conditioner and air purifier usage observed in the survey. Residents appear to recognise that better building design could reduce their dependence on technological solutions and improve environmental comfort more naturally.

The findings therefore suggest that sustainability cannot be measured only by planned architectural features or marketing claims. Instead, it must be assessed through residents' daily experiences, their level of comfort, and the practical functioning of environmental systems within the housing complex. A building may be designed with sustainable intentions, but if residents still rely heavily on energy-consuming appliances and continue to desire basic environmental improvements, its sustainability goals remain only partially achieved.

This gap is made more visible when the development's own stated sustainability commitments are examined. According to the NMP Design landscape report and the Victory Valley residents' association website, Ireo Victory Valley was designed with a range of passive and active sustainability features: landscaped areas are graded slightly lower than adjacent walkways so that rainwater percolates naturally into the ground; sensor-based, time-and-need sprinklers and native drought-tolerant species are used to minimise irrigation; recycled water is channelled for landscape irrigation; rainwater harvesting systems are in place; and solar energy supplements power for common areas and street lighting, alongside LED fixtures throughout. These commitments position the development as an environmentally responsible project. However, when placed alongside the survey findings, in which no resident reported access to solar panels, 82.5% expressed a desire for rooftop solar, and 72.5% called for rainwater harvesting, it becomes clear that either these systems are not functioning as intended, are limited to backend infrastructure invisible to residents, or are not communicated in a way that residents recognise as meaningful. The gap, therefore, lies not only between design intention and lived experience, but also between what the development has publicly committed to and what residents actually perceive to be present in their daily environment.

Resident Awareness, Aspiration, and Willingness to Participate in Sustainability

This theme focuses on how much residents understand, value, and are willing to invest in sustainable housing practices. The question of how much extra residents would pay per month reveals the gap between environmental awareness and financial commitment, while the multiple-choice question on preferred sustainable features shows what residents prioritise, such as better ventilation, green shade, solar systems, or water management. This theme helps to discuss whether sustainability is seen as a shared community responsibility, a lifestyle aspiration, or an additional cost that residents may or may not accept.

The survey findings also provide insight into how residents perceive sustainability and the extent to which they are willing to support it financially.

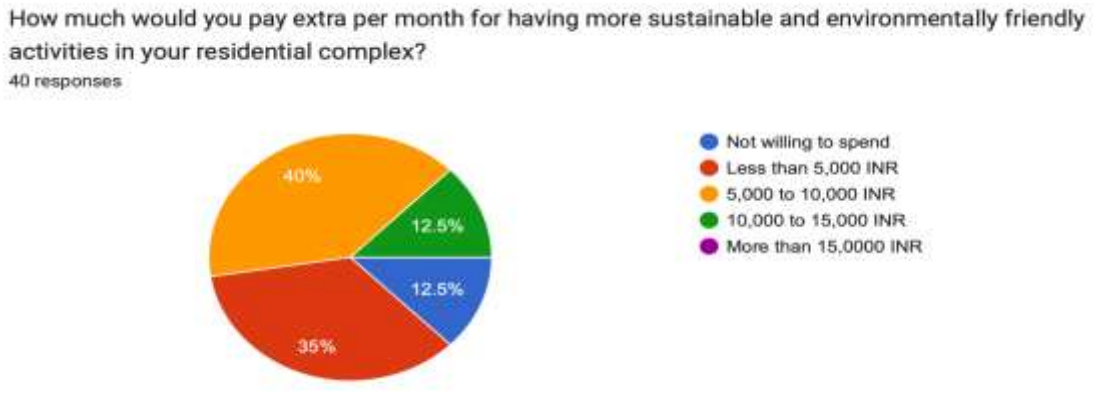

Figure 8. Willingness to pay extra per month for sustainable and environmentally friendly initiatives (n = 40).

The results demonstrate a generally positive attitude towards sustainable living. Only 12.5% of respondents stated that they were unwilling to spend additional money on environmentally friendly initiatives within their residential complex,

while 87.5% expressed a willingness to contribute financially. The largest group (40%) indicated that they would be willing to pay between ₹5,000 and ₹10,000 per month, while a further 12.5% were willing to pay between ₹10,000 and ₹15,000 per month.

These findings suggest that environmental awareness among residents is relatively high. Sustainability is not viewed merely as an abstract environmental concept, but as something that can improve quality of life. Residents appear willing to invest in measures that provide long-term benefits, such as reduced energy consumption, improved environmental quality, and better resource management.

The preferences expressed for future sustainable features further support this conclusion. The strong demand for rooftop solar systems, rainwater harvesting, wastewater reuse, and improved ventilation indicates that residents prioritise practical and visible sustainability measures. Interestingly, features related to everyday comfort, such as better ventilation and green shaded spaces, received support comparable to resource-management systems, suggesting that residents often connect sustainability with enhanced living conditions rather than viewing it solely as an environmental responsibility.

At the same time, the variation in willingness to pay highlights the existence of a financial threshold. Although most residents support sustainable initiatives in principle, the level of financial commitment differs among households, suggesting that the successful implementation of sustainable housing practices may require a combination of resident participation, institutional support, and cost-effective technologies.

Overall, the results indicate that sustainability is increasingly viewed as a shared responsibility. Residents demonstrate awareness of environmental issues and a willingness to support sustainable improvements, provided these measures offer tangible benefits and remain financially accessible.

Overall Interpretation

Taken together, the findings indicate that residents value sustainability and are willing to support it financially, yet their everyday experiences reveal significant dependence on technological systems for comfort. The absence of widely desired sustainable features, combined with heavy AC and air-purifier use, highlights a disconnect between sustainable housing ideals and actual residential performance. This suggests that future housing developments should focus not only on sustainability as a design concept, but also on delivering measurable improvements in environmental comfort, resource efficiency, and resident well-being.

Conclusion

This study set out to understand whether sustainability in high-rise housing extends beyond architectural claims and is reflected in the everyday experiences and practices of residents. Through the use of both primary and secondary data, the research examined the relationship between sustainable housing design, environmental comfort, and resident participation in the context of Ireo Victory Valley, Delhi NCR. The primary survey data revealed that while residents value sustainability and are aware of its importance, their daily comfort often depends on technological interventions such as air conditioners and air purifiers. The findings also highlighted a gap between the sustainable features residents expect and what is currently available within their housing complex. At the same time, residents expressed a willingness to support environmentally responsible initiatives when these are practical, beneficial, and financially feasible. Secondary sources helped situate these findings within broader discussions of Sustainable Development Goal 11 and sustainable urban development, reinforcing the idea that sustainability is shaped not only by infrastructure and design, but also by community practices, governance, and individual behaviour.

However, this research has certain limitations. The study was conducted within a limited time frame and focused on a single residential society with a sample size of 40 respondents, resulting in a compact dataset that may not fully represent the diversity of experiences across Delhi NCR or other urban regions. Survey participation was also influenced by residents' varying levels of awareness and understanding of sustainability-related issues, which may have affected some responses. Future research can build upon this study by expanding its scope to include multiple residential societies across different Indian cities, such as Gurgaon, Hyderabad, and Bengaluru, allowing for meaningful comparisons in sustainable housing practices. It could also be extended into a global comparative study exploring how different countries address sustainable living within residential communities, providing deeper insight into the ways cultural contexts, governance systems, and community participation influence the transition towards truly sustainable urban housing.

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