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Socio-Economic Drivers of Community Acceptance of Sustainable Social Housing: Evidence from Mumbai

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Abstract: The impact of socio-cultural outlooks on the acceptance of sustainability measures in a low-income context should be complemented by better understanding of socio-economic drivers to bridge the gaps between policy expectation and acceptance in social housing projects. The study attempts to explore the different aspects of well-being in determining the housing satisfaction of the residents of social housing under the slum rehabilitation schemes in Mumbai. Social housing offers considerably improved social and environmental sustainability components compared to slums; however, social acceptability remains low due to their location disadvantages. Using primary data collection from the sample of 298 households in Mumbai, the paper explores the varying levels of their housing satisfaction. The study found that economic opportunity is low in slum rehabilitation, mostly reflected in the job loss of the second earner, exacerbated by the change of work after shifting to social housing. Among other factors, location, accessibility of the building, household size and opportunity for social engagement play the most critical role in deciding the households' perceived housing satisfaction with social housing compared to slums.

Keywords: sustainability; social housing; community acceptance; housing affordability; housing accessibility; India

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1. Introduction

Housing is an essential aspect of sustainable development. Through its construction, design, use and demolition, housing contributes to the consumption of natural and man-made materials resources, water and energy [1]. As sustainable development is highly interlinked with the concept of quality of life, well-being and liveability [2], sustainability measures are increasingly at the forefront of housing provision efforts as housing is a significant tool to deliver both quality of life and sustainable development. The imperative of climate variability means that our housing technologies and design need to be more sustainable in reducing their contribution to greenhouse gas (GHG) emissions [3]. Sustainable housing is expected to improve energy efficiency, ensure access to safe drinking water, sanitation and hygiene, and reduce waste and water pollution. These structural and design elements of housing, alongside other housing components such as housing location, environment and expenditure burden, can, directly and indirectly, affect people's choices and chances to improve their quality of life.

In practice, sustainability is one of the neglected aspects of housing provision for the poor. The low-income housing sector has been unable to effectively adopt innovative technologies to improve housing sustainability and cost-effectiveness [4]. Moreover, despite the extensive efforts to make housing and infrastructure more sustainable, it remains to be seen to what extent sustainable housing contributes to the overall work of improving the poor's overall quality of life. The technological aspect of housing, aside from basic services (e.g., water and sanitation, waste management, heating and cooling), is yet to be part of the social-economic system of housing policies. Social housing projects are not motivated by sustainability policy but by the need to improve economic indicators in the generation of housing stocks [5]. Whenever available, a critical issue facing the introduction of technological innovation in housing is that the selection of materials and quality of assembly does not always go hand-in-hand with reducing long-term operations and maintenance costs and minimising environmental impacts.

These gaps are further exacerbated by practical issues, such as the preferences and behaviours of the public toward sustainable housing remaining vague [6]. There are also challenges associated with low acceptance of the introduction of energy technology among low-income urban dwellers [7]. Lack of available sustainable housing indicators, especially targeting the poor, and little consideration for underlying socio-cultural causes are some of the main reasons for this drawback. Some housing indicators have captured economic, social and environmental sustainability [8,9], but these are very limited when applied to developing countries. In some cases where policymakers are motivated to deliver housing that meets the energy and financial needs of the poor, the implementation is often not well-planned, resulting in agendas framed by the assumption that the poor will readily accept the new technology [7]. Governments and developers also often assume that a new technology or approach's high general popularity should be a vital precursor for the acceptance of a specific project.

As part of efforts to overcome these issues, factors influencing community acceptance are increasingly recognised as essential to understanding the apparent contradictions between support for sustainable housing and the difficult realisation of low-income housing projects [10]. The concept of collective social influence is also argued to positively affect the socio-cultural acceptance of energy technologies amongst low-income urban dwellers in developing countries [7]. The impact of socio-cultural, socio-economic and socio-technological outlooks on the acceptance of sustainability measures in a low-income context merits further research and understanding to inform the policymaking process. In this article, we argue that the gaps between policy expectation and acceptance can be bridged by better understanding of the various socio-economic and socio-technological drivers of acceptance in social housing projects, complementing the socio-cultural dimensions. We use the concept of community acceptance, which forms the social acceptance approach when combined with socio-political and market acceptance. Community acceptance is one area of social acceptance that directly focuses on the user's end. Scholars have suggested linkages between user satisfaction and technology acceptance [11]. In the green building segment, residents are concerned about building performance, including economic, ecological and social benefits; their satisfaction with building performance affects their acceptance of green buildings [6]. Residents expect that green buildings outperform conventional counterparts in areas such as indoor environment quality, energy saving, comfort and satisfaction. Residents of social housing in India exhibit a similar vision prior to relocation; rehabilitation connotes an improved quality of life and provides satisfaction [12]. Existing literature also suggests that housing quality mediates the relationship between social housing and slums concerning the quality of life [13]. Building on this, community acceptance in our study refers to residents' acceptance of social housing with sustainability features, represented by their housing satisfaction with the overall quality of life in social housing after being relocated from slums. As such, this study relates the concept of community acceptance with the concept of residential satisfaction and quality of life applied to residential quality.

This article seeks to understand the key factors relevant to the quality-of-life influencing housing satisfaction of the residents of sustainable social housing in resettlement projects. Specifically, this article investigates the implementation of social housing equipped with energy efficiency design and waste management in their properties from residents' experience. Three social housing complexes in Mumbai, India, which resettled slum dwellers, are taken as a case to study different socio-economic and socio-technical/environmental factors that can foster or hinder housing satisfaction. Mumbai, located on the western coast, is India's largest metropolitan and commercial capital. The city has experienced rapid population growth over the past 20 years attributed to migration from other regions. As a result, Mumbai has been burdened with low housing quality, pockets of slums and increasing demands for affordable housing. An estimated 9 million people live in slums, approximately 41.3 per cent of the total population of Greater Mumbai [14]. Slums have consistently proliferated despite several successive slum rehabilitation policies [15]. The slum rehabilitation process in Mumbai and its outcomes have been the centre of multiple studies, looking at various approaches; policymaking [15,16], gender and energy [17] and building performance [18], to mention a few. Several studies focusing on residential occupant behaviour and perception of technology exist in the current literature, with a particular focus on indoor air quality and thermal comfort [19–22]. While these studies agree that economic and socio-cultural context plays a pivotal role in technology acceptance, most address the acceptance of sustainable social housing in a fragmented way, either through a socio-economic or socio-technical methodology. Specific studies on overall social acceptance in the affordable housing segment remain underexplored and need concentrated attention.

This article adopts a community acceptance perspective (through residents' housing satisfaction) on economic and non-economic determinants of household practices in social housing in Mumbai. Economic and non-economic determinants were carefully selected from existing indicators relevant to sustainable housing, green building and affordable housing to represent the socio-economic and socio-technological context of sustainable social housing. The analysis result is intended as an intervention that informs evidence-based policy and academic debate on a better understanding of facilitating socio-economic factors and barriers linking sustainable housing delivery and community acceptance. By identifying the different aspects of well-being determining residents' housing satisfaction, this article makes a case for reframing discussions on community acceptance of sustainable social housing projects under the slums rehabilitation schemes in Mumbai to fill the gap of evidence on transitions to sustainable urban resettlement.

Following this introduction, the article is organised as follows. The next section (Section 2) reviews the community acceptance of sustainable housing literature, followed by an overview of Indian sustainable and affordable housing development, slum rehabilitation and social housing policies in Mumbai. Section 3 presents the methodology and identifies the empirical strategy. Section 4 has the empirical results, while Section 5 provides discussions based on the results and descriptive data analysis. The broad conclusions and implications of the study are presented in the final section.

2. Literature Review

2.1. Community Acceptance of Sustainable Housing

Community acceptance is one of the three dimensions of social acceptance, along with socio-political and market acceptance. It refers to the specific acceptance of decisions and projects by local stakeholders, particularly residents and local authorities [23]. Community acceptance through public participation can be operationalised as procedural justice in project planning [24]. Social processes with residents' engagement and participation in the life cycle of the green building show a dynamic trend, which can improve residents' happiness and productivity [6]. In social housing projects, the degree of public involvement can be measured through residents' participation in planning, design, operation and maintenance. Such public involvement could range from one-way communication through information sharing to active involvement in decision-making. In practice, public participation in the planning and designing of social housing is highly limited. None of the slum rehabilitation schemes being implemented in Mumbai so far mentioned any kind of participation from the slum dwellers [16].

A key factor for the acceptance of sustainable housing is a consideration of economic and non-economic determinants, which include environmental effects, technology-oriented aspects and user-focused aspects [6]. The introduction of new technology in housing means users' economic viability, such as housing expenditure and household income informality, can influence residents' perception of the technology installed. Social and humanistic needs interplay with economic consideration and create a dynamic role in the life cycle of green buildings [6]. As such, social processes involving resident engagement and participation need to be considered in all stages of buildings, from the conceptual and development stages to operation and maintenance in order to prevent design failures and advance the users' quality of life [6,25]. This means when a local government or a housing project developer introduces various technologies in developing sustainable housing projects, residents' acceptance becomes relevant in implementation decisions and ideally should be included in the decision-making process.

Acknowledging the need for broader understanding of residents, social acceptance scholars have proposed examining social acceptance of different new technologies in a less exhaustive but comprehensive approach by establishing a survey organised to accurately identify the needs, wishes, preferences and expectations of the residents. For example, Yuan et al. [26] identified the role of income, age and education of residents in the level of awareness of solar energy technologies and their decision to implement them. With the introduction of vertical farming in housing, perceived benefit, risk, location, demographic characteristics, value and belief, trust, fairness and knowledge are recognised as crucial determinants influencing community acceptance [27]. These studies suggest that resident perceptions can influence the success of the technology installation project in housing projects. In turn, there is a positive effect if projects advance and they can utilise the technology well. Hence, community acceptance can become a catalyst that encourages sustainable lifestyles and, in a broader scope, steer cities toward more sustainable consumption [28].

Despite the interest in advanced studies on social acceptance in the housing sector, considerations related to community acceptance are seen as desirable but are rarely included in projects developing novel building systems [25]. Among the available studies, even less available are those looking at community acceptance of new technologies implemented in social housing [29,30]. Energy efficiency received the most interest in existing research addressing the introduction of new technology in social housing. In this setting, studies have argued that inherent barriers and success factors are embedded within the relationship between the housing provider and low-income residents during the installation of new technologies [31].

Systematic research on factors affecting community acceptance is scant, and it is challenging to recognise divergences between relevant drivers in diverse socio-cultural and political contexts [32]. As a result, community acceptance should be viewed according to specific sectors and disciplines [27]. In the housing sector, community acceptance is shaped by factors associated with the information made available to users, public involvement in the projects, residents' trust in developers during the project development, and the anticipation of projects, including risks and benefits [33]. In cases where the installation of new technologies in social housing is decided by governmental policy instead of a decision by the residents, efforts are needed to inform and involve them regarding the benefits of technologies to avoid abandonment and replacement [29]. Additionally, since introducing new technologies in housing affects many stakeholders differently depending on various contexts, greater understanding of socio-economic and socio-cultural determinants of different technologies across different localities is needed. Research suggests that introducing technology which requires extensive awareness from residents, such as solar panel installation, involves capacity building and awareness-raising for residents during the pre- and post-design stage. In introducing technology that entails alteration of building façades, such as solar PV and vertical farming, the research argued that attitudes towards the technology and its application and perception of aesthetics are also important factors affecting acceptance [25]. Developers play an important role in raising residents' awareness and ensuring necessary information is available. However, developers also often lack awareness and information on the technologies introduced in the implementation.

Aside from the information and physical features of housing and technology offered, accessibility of economic opportunities and affordability are key factors linked to the acceptance of sustainable housing. The increased focus on the sustainability of housing does not necessarily go hand-in-hand with affordability; using traditional design and construction methods has led to poor cost-effectiveness of sustainable, affordable housing [10]. Affordability, forming the basic economic unit of human settlement in the built environment, is a crucial component of housing research focusing on the poor. As socio-environmental sustainability is closely linked to economic sustainability, studies have pointed out that financial assistance often fails to help the poor meet their housing needs as the affordability of a household depends on its command of the various resources required for housing [34]. The households' actual and potential savings are the most important financial resources, and employment or income generation enables the poor to afford a dwelling and maintain it [35]. The housing sector is employment-intensive during its life cycle, construction and proper maintenance [36]. The affordability of housing, thus, should be seen beyond rent and as an integral part of economic sustainability, which strengthens the economic self-reliance of the household, especially for the poor [34].

2.2. Development of Indian Sustainable and Affordable Housing

The concept of sustainable housing that incorporates green technologies and designs is still emerging in India. In 2013 (later updated in 2016), a new Part 11 was added to the National Building Code of India to cover the parameters required to be considered for planning, design, construction, operation and maintenance of building and land development from the point of sustainability. Despite the housing sector having adopted creditworthiness for environmental protection, work on sustainable housing has been largely limited to standalone projects catering to upper-middle and high-income populations. A large section of the Indian population is unaware of green building practices [37]. Regardless, sustainable and affordable housing has gained importance in India. Indian Green Building Council (IGBC) has launched the green affordable housing rating system providing no or minimal additional cost to the developer or the residents. It is a voluntary, consensus-based and market-driven rating system by an independent third party that received incentives from several Central and State Government agencies to promote the green building movement. There is also a promising trend where developers are showing interest in investing in housing for low-income groups in cities where demand for high-income groups is in a semi-saturated state [38]. An example of a successful case is the passive solar housing using passive thermal heating in the Kargil district, which reduces the fuel consumption needed for indoor heating by up to 60 per cent [39].

The main reason behind adopting green technologies in the Indian housing sector is energy conservation, including reducing utility bills [40]. India has a lesser record in implementing prefab technology with sustainable industrial byproducts and insulation materials in its housing projects [41]. Hence, sustainable housing measures primarily focus on energy- and water-saving technologies and design, waste management and healthier spaces for residents. These measures align with the Leadership in Energy and Environmental Design (LEED) and Green Rating for Integrated Habitat Assessment (GRIHA) rating systems as well as the recent national focus on energy and resource efficiency. The latest Energy Conservation in Building Construction enacted in 2017 is also a positive step toward expanding the current energy conservation practices for the construction and operation of housing. However, more efforts are needed to link energy conservation practices with the built environment, contributing to healthy living space and overall comfort. A behavioural study in slum rehabilitation housing has revealed that slum dwellers who moved to social housing perceived that such housing suffers from lack of comfort levels and indoor air quality [13]. Lack of ventilation and fresh exchanges lead to relocated dwellers seeking more healthcare visits [42], establishing a critical link between the quality of the built environment and health outcomes in affordable housing [19].

Mitigating built-environment-related discomfort can improve energy conservation practices and the sustainability of low-income housing. The design of the low-income social housing often exaggerates residents' discomfort due to incompatible common attitudes and practices. For example, windows designed to regulate thermal comfort may not properly function as residents keep windows closed to prevent burglary, dust and insects. The previous study has pointed out that the lack of basic literacy, education and levels of empowerment of the community affected residents' capability and mentality to maintain and operate the building in Indian affordable housing as the designers would have expected [43]. Households' adaptive actions such as window opening, energy knowledge related to electricity-related expenditure, and energy habits in operating household devices are observed as important variables influencing actions within low-income social housing in Mumbai [18]. Energy and water access and housing design also affect women's practices indoors (e.g., cleaning, cooking and childrearing), creating undesirable impacts such as higher energy intensity, reduced social interaction and loss of women's social capital [17]. Understanding the local socio-cultural contexts, which influence household practices, attitudes and emotions, becomes critical for the success of sustainable and affordable housing projects [19]. Developing low-income housing aimed at comprehensively and concurrently achieving a higher quality of life and well-being with the introduction of new building technology and designs needs to facilitate adaptive actions based on socio-cultural characteristics.

The urban housing shortage is estimated to be around 18.78 million in 2012, with 96 per cent of it skewed towards the poor [44]. Transition to sustainable housing thus is greatly needed for the housing sector to contribute significantly to the GHG reduction. However, research pointed out that housing and resource-efficiency objectives are not being pursued concurrently. The broad themes or rationales of India's main policy instrument on housing and the urban sector focus extensively on affordability and quantity rather than sustainable social housing [39]. Despite the inherent connection between housing and well-being, slum rehabilitation and low-income housing guidelines are missing sustainability elements such as energy conservation and sustainable healthy community in housing and built-environment plans. Housing units under the slum rehabilitation policy in Mumbai, for instance, are restricted to an area of 25 square meters (approximately 269 square feet) with no basic guidelines for energy efficiency or building design [42]. Housing policies such as Rajiv Awas Yojana or Pradhan Mantri Awas Yojana also have not made sufficient linkages with the environmental policies and commitment at the national level. As observed in Mumbai, this lack of sustainability guidelines in affordable housing is aggravated by insufficient planning tools and methodologies available to the city planning departments [45]. Recent government-led climate change adaptation and mitigation missions could offer synergies with the housing sector. For example, the National Mission on Sustainable Habitat (NMSH) 2010 covers climate change adaptation through the betterment of housing and infrastructure related to water, sanitation and energy, among many. Since there is no information on the level to which NMSH is resourced, it remains unclear how this mission could lead to better implementation of sustainable housing in India and those for the poor in particular.

Existing climate change adaptation actions in Indian cities focus greatly on building local capacity and are primarily project-based and reactive with limited consideration of long-term climate risks [46]. Actions such as solar-powered buildings and cool-roofs (e.g., Ahmedabad, Hyderabad) are small interventions as part of smart city projects. With the challenges associated with affordable housing and slum rehabilitation, climate change adaptation policies for the housing sector remain a blind spot in the current housing policies. Addressing the affordable housing challenges and specific socio-cultural characteristics of the low-income population would require a deeper involvement of socio-architectural elements in the design process [45]. The ultimate goal of sustainable and affordable housing should go beyond conserving resources by introducing technology to improve the quality of life. Hence, climate change adaptation in the housing sector, including through the introduction of new technology, needs to take into account factors affecting the quality of life of the residents and the economic burden of health and adaptation costs at the household level.

2.3. Slum Rehabilitation and Social Housing Policies in Mumbai

In the Indian context, the term affordable housing is more common and is used interchangeably with social housing [39]. While in other countries, social housing covers all housing that receives some form of government support or assistance, in India, it refers to affordable housing regardless of the providers. Social housing in India, thus, includes affordable housing provided by the private sector, cooperatives, community groups, non-profit private firms and political organisations. The government, however, remains the main provider of low-income social housing, i.e., housing for the Economically Weaker Section (EWS) and Low-Income Group (LIG). The government also defines affordability as a ratio of housing expenditure to annual household income.

Given the challenges in providing housing, a number of policies have been enacted at the national level. Aiming to make India slum-free, the pilot phase of Rajiv Awas Yojana was launched in 2011. The scheme has a progressive architecture that includes in situ rehabilitation of slums and legislation to provide property rights to slum dwellers. The twelfth FYP said that urbanisation should be guided towards inclusive, equitable and sustainable growth of towns and cities with proper civic amenities. Good urbanisation would ensure that towns and cities are free from slums and provide adequate employment opportunities and a decent quality of life to all their inhabitants, including the poor. The plan recognised that the private sector's supply of decent, affordable housing has remained woefully inadequate. A multi-pronged strategy is required to meet the need for housing for the urban poor.

The most recent initiative by the central government is the Housing for All 2022 or Pradhan Mantri Awas Yojana (Urban) (PMAY (U)) scheme. Under this scheme, around 20 million urban houses have to be constructed in India by 2022. In March 2022, the scheme recorded 5.635 million houses completed, 11.544 million houses sanctioned and 9.518 million houses grounded [47]. A key aspect to the success of this programme is slum rehabilitation, a long-standing government strategy to provide housing for the poor. The current scheme can be traced back to the beginning of the 1990s when the state government formulated a new Slum Rehabilitation Scheme (SRS), preceded by a succession of programmes and policies beginning in 1956. It is worth noting that the year 1991 marked the start of the privatisation of slum rehabilitation in India. Under this SRS, slums can be redeveloped, and as an incentive to those conducting the redevelopment, permission could be granted for extra building space. By providing the developer with extra building space that can be sold on the open market, accommodation for slum dwellers would be cross-subsidised. For the state government, this arrangement is aimed at fulfilling its obligation to the "Housing for All 2022" scheme [16]. The private housing and construction industry was expected to contribute significantly to this programme. Guidelines spelt out the profit limit (25 per cent) and the extent of the incentive (based on the Floor Space Index (FSI)). A group headed by the municipal commissioner had to approve each proposal, but the programme did not take off in any significant way. Critics pointed out that the scheme needed better regulatory guidance [48] and that it was driven by the private developers' interest instead of serving the interest of the slum population [16].

The security of tenure is indispensable when addressing slum rehabilitation and delivering successful social housing measures. However, the security of tenure was not considered to be an important parameter when declaring any area as a slum by the Slum Act, Census or National Sample Survey Organisation (NSSO). Across the states in India, including in Mumbai, the concept, perception and definition are different, depending on the socio-economic conditions. This leads to discrepancies between the parameters adopted by State Governments, the Registrar General of India (RGI) and NSSO. In Mumbai, according to the Maharashtra Slum Areas (Improvement, Clearance & Redevelopment) Act, 1971, any area can be declared as a slum area by the district collector if the area is or can be a source of danger to the health, safety or convenience of the public of that area or its neighbourhood. Having inadequate or no basic amenities or being unsanitary, squalid, overcrowded or otherwise is considered detrimental to the public's health, safety or convenience in that area. An area can also be declared a slum if the buildings used or intended to be used for human habitation are unfit for human habitation due to various reasons such as dilapidation, overcrowding, faulty arrangement and design of such buildings, narrowness or faulty arrangement of streets, lack of ventilation, light or sanitation facilities or any combination of these factors. The following conditions should be fulfilled to decide whether the buildings are unfit: (a) repairs; (b) stability; (c) freedom from damp; (d) natural light and air; (e) provision for water supply; (f) provision for drainage and sanitary conveniences; (g) facilities for the disposal of wastewater.

3. Data and Research Methodology

3.1. Description of the Study Area

This study was conducted in Mumbai, India and targeted social housing accommodating relocation from slums and squatter settlements. Social housing locations were selected based on their sustainability features, building age, distance from the previous living area for most of its residents, and proximity to the city centre, commercial districts, industrial sites and basic urban services such as schools, hospitals, markets and parks. The three social housing complexes selected are located in Shivneri, Santacruz and Bhoiwada. As in other more recent housing projects, eco-housing criteria were applied during the project's implementation. This includes the biodiversity conservation method for eco-housing during the site planning process, environmental architecture through adopting climate-responsive design practices to achieve thermal comfort and cross-ventilation and reduce glare, energy conservation and management with the use of fluorescent lamps, efficient building materials for finishing materials, water conservation and waste segregation facilities.

3.2. Study Design

This paper focuses on the third component of social acceptance, i.e., community acceptance. Here in this paper, it is measured as household-level acceptance of sustainable housing through residential satisfaction—Quality of Life (QoL). Residential satisfaction and the willingness to pay are common determinants in studies related to public acceptance of new technology instalments in the housing sector [6,49]. Within psycho-social study, the term quality of life is frequently used interchangeably with subjective well-being, satisfaction or happiness, depending on the specific field in question [50]. Subjective well-being, in particular, concerns how people evaluate their lives, including in the form of conscious evaluative judgements about specific aspects [51]. Moreover, quality of life is a multidimensional phenomenon linked to economic, socio-cultural, psychological and environmental studies. One of the important issues to consider is that quality of life measures relate to the interaction between people and their environment [52].

Perceived benefit perception affects the level of acceptance, along with perceived risks, values and beliefs, location, public awareness, demographic characteristics, perceived trust and fairness [27]. Different studies used different factors to measure acceptance depending on specific socio-cultural and political contexts. Our variables to measure acceptance of sustainable housing were developed from sustainable housing indicators [34,53], a model of housing quality determinants for affordable housing [54,55] and green building assessment tools (BREEAM, IISBE, USGBC). In identifying the distribution of economic and social gains, this research included the attributes of well-being, employment, affordability and accessibility. The study expects variations across all three variables (i.e., economic efficiency, social opportunity, environmental protection) affecting the acceptance of sustainable housing. The questionnaire was designed with closed-ended questions of 5 pointers Likert scale for the perception-based questions to reduce doubt, increase consistency and understand the outlook of a parameter across the respondents. The direct entry option was used for questions where amounts are used (e.g., frequency, income, hours, etc.) to alleviate the specificity and ordinality problem. In order to maintain the cross-validation of subjective responses, the questionnaire was supplemented with open-ended questions that two authors independently analysed to come to a joint conclusion about the perceived improved quality of life (residential satisfaction). Figure 1 illustrates the community acceptance model.

1. Environmental protection/Resource efficiency: Resource efficiency (energy use) in terms of electricity required for lighting and cooling is an essential determinant of residential satisfaction.
2. Economic efficiency: Time taken (distance) in commuting for work does not affect residential satisfaction; housing design and location of the housing complex (to the commercial district) are essential factors influencing residential satisfaction; sustainable social housing can benefit local populations through employment and job creation, given that inhabitants are relocated in situ.
3. Social satisfaction: Involvement in decision-making does not necessarily translate to satisfaction over the process (participation can be made compulsory, peer pressure); the positive attitude towards community participation (self-initiative and level of satisfaction over the process) affects acceptance towards resource efficiency measures implemented through community-based planning.

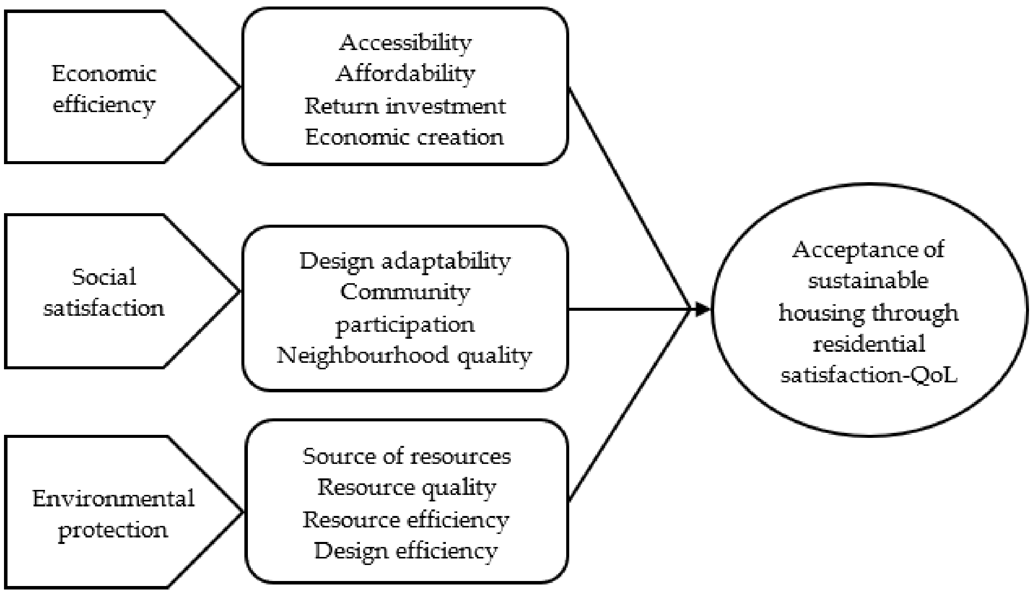

Figure 1. Community acceptance model of sustainable housing at the household level.

The following logit regression model (Equation (1)) is applied to analyse the determinant of community acceptance of social housing measured as improvement in a perceived improvement in quality of life (QoL). The explanatory variables used in the model are building location, i.e., proximity to the city centre, demographic, i.e., gender of the household head, household size, and socio-economic characteristics of the household, i.e., income class. Community acceptance plays a role in accepting or rejecting innovations, and location (geographical location, place attachment) can specifically facilitate or impede acceptance in low-income communities [56,57]. Demographic characteristics have been demonstrated to affect people's perception as they relate to socio-economic features, living circumstances, and personal knowledge, experience and worldviews [49]. The extant literature findings suggest that occupant behaviour of slum rehabilitation housing in Mumbai is influenced by socio-demographic characteristics, behavioural adaptation and lifestyle practices (energy habits, appliance usage, clothing adaptation) [58]. Socio-economic characteristics of the households are considered a determiner of our perceptions and behaviour toward environmental attitudes [59]. A behavioural study of residents from slum rehabilitation housing provides valuable insights into the occupant behaviour diversity in energy use and perceived comfort within a similar socio-economic structure [18].

The model also includes subjective residential satisfaction in terms of cost of living, perceived social satisfaction in regard to social engagements, and income opportunities in the present house compared to the previous house of the household. These three independent variables cover the perceived benefit perception of socio-economic (economic efficiency and social engagement) and socio-technological (environmental protection) determinants of community acceptance (Figure 1). The general expectation is that people expect socio-economic benefits to be significantly positive for societies in the context of new technology installations in developing countries [32].

$$\begin{aligned}\Pr(\text{community acceptance} = 1) \\ &= \beta 0 + \beta 1 \text{ Housing location} + \beta 2\text{j Demographic Characteristics} \\ &+ \beta 3\text{k Socioeconomic Characteristics} + \beta 4 \text{ Living expenses} \\ &+ \beta 5 \text{ Economic opportunity } + \beta 6 \text{ Social engagements } + \varepsilon\end{aligned} \quad (1)$$

In the model, community acceptance takes the value "1" if there is an improvement reported in QoL compared to its previous house. This construct corresponds to our view of residential satisfaction—QoL as the response of housing location, demographic characteristics (age and gender of household head), socio-economic characteristics (household size), living expenses, economic opportunity (accessibility of the building) and social engagements as predictors. Except for the household size, all other variables are categorical in nature. The community acceptance takes the value "0" otherwise. The number of samples collected is 298 respondents. The summary statistics and ANOVA of the variables used in the regression analysis are reported in Tables A1 and A2, respectively.

4. Results

4.1. Empirical Result: Perceived Residential Satisfaction

Table 1 presents the results of the factors influencing the perceived quality of life and thus the community acceptance of the houses in the sample housing complexes. Starting with household characteristics, we find that gender has no significant impact on the community acceptance of the social housing in our sample. This insignificant outcome of gender could likely be because of the small sample. Larger households tend to have more acceptance of social housing. However, the interaction of household size with building location has lower housing acceptance (Shivneri and Santacruz). The larger households in Shivneri and Santacruz locations have lower residential satisfaction than the residents of Bhoiwada. This might be because of the small floor area of the houses. Before 2019, SRA had only 25 square meters of houses to offer as slum rehabilitation housing. In 2019, they marginally increased their floor area to 30 square meters (approximately 322 square feet). The average household size is around 4.5 members in our sample; 25 square meters is slightly too tight for a family of 5. Higher-income classes tend to have higher acceptance of the public houses in our sample. This may be because they have enough resources to modify the layout of the flats according to their requirements and can afford better amenities to derive maximum comfort from the houses.

Households' living expenses, which are used as a proxy for resource efficiency and cost of living because they majorly comprise consumption expenditures (food, water, electricity etc.) compared to their earlier residence, are surprisingly negative and insignificant. Improvement in the accessibility of the building, which is a proxy for economic opportunity, tends to be reflected in higher acceptance of social housing. The other important variable affecting the likelihood of higher social acceptance is the opportunities for higher social engagements. The households who reported a decrease in social engagements in the current residence compared to their earlier residence are less likely to report higher residential satisfaction. Location is a crucial determinant of residential satisfaction. Households living in dwellings closer to the city centre reported higher acceptance of social housing.

Table 1. Logit estimates of factors determining residential satisfaction in Mumbai.

Independent Variables	Coefficient
Economic opportunity/accessibility of the building (deterioration as the base)	
Same as before	0.0486
	(0.335)
Improvement	0.619 ***
	(0.121)
Living expenses (decreased expenses as the base)	
Same as before	0.131
	(0.664)
Increased	−0.0849
	(0.220)
Social engagements (increased as the base)	
Same as before	−0.0364
	(0.669)
Reduced	−1.297 ***
	(0.468)
Housing location (Shivneri as the base)	
Santacruz	−0.959 ***
	(0.286)
Bhoiwada	−1.343 ***
	(0.109)
Age of the household head	−0.00452
	(0.00377)
Household Head Male	0.0397
	(0.493)
Household Size	0.134 ***
	(0.0205)
Frequency of Garbage Collection	−0.0727
	(0.109)
Interaction [household Size and Shivneri]	−0.0882 ***
	(0.00158)
Interaction [household Size and Santacruz]	−0.0987 ***
	(0.0296)
Constant	2.257 ***
	(0.580)
Observations	298
Robust standard errors in parentheses	
Dependent variable: Community acceptance	

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

4.2. Hosmer and Lemeshow's Test, Goodness-of-Fit

We use Hosmer and Lemeshow's test to test the goodness-of-fit of our model. In Hosmer and Lemeshow's goodness-of-fit test, the predicted frequency and observed frequency should match closely, and the more closely they match, the better the fit. The Hosmer–Lemeshow goodness-of-fit statistic is computed as the Pearson chi-square from the contingency table of observed and expected frequencies (Table 2). A good fit, as measured by Hosmer and Lemeshow's test, will yield a large p-value. With a p-value of 0.61, we can say that Hosmer and Lemeshow's goodness-of-fit test indicates that our model fits the data well. For sample sizes (n) up to 1000, the currently used standard with the number of groups (g) is 10. Ideally, $g > P + 1$, where P is the number of covariates (7 in our model). With the choice of $g = 10$, the power of Hosmer and Lemeshow's test is reasonably small (30–40 per cent), whereas higher power exhibits a moderate lack of fit [60].

Table 2. Hosmer and Lemeshow's test, goodness-of-fit.

Group	Prob	Obs_1	Exp_1	Obs_0	Exp_0	Total
1	0.7199	17	18.8	13	11.2	30
2	0.7471	22	22.1	8	7.9	30
3	0.7686	27	22.8	3	7.2	30
4	0.7902	22	23.3	8	6.7	30
5	0.8260	23	23.5	6	5.5	29
6	0.8485	27	25.2	3	4.8	30
7	0.8732	24	25.9	6	4.1	30
8	0.8929	27	26.5	3	3.5	30
9	0.9099	26	27.0	4	3.0	30
10	0.9504	27	26.9	2	2.1	29

Number of observations (n) = 298
Number of groups (g) = 10
Hosmer–Lemeshow chi2(8) = 6.37
Prob > chi2 = 0.6054

Note: Table collapsed on quantiles of estimated probabilities.

5. Discussion

5.1. Housing Characteristics and Economic Opportunities

All the slums in Mumbai do not consist only of residential areas; they also include commercial uses such as shops and small-scale industries [61]. With most slum inhabitants working and earning their income close to their accommodation, any housing-led urban regeneration through slum rehabilitation should consider location as one of the main factors that could create a trade-off for social housing affordability. Table 3 shows that relocation affects changes in the primary source of income in all three examples of social housing observed. More than 50 per cent of households report changes in work, including changes in the type of work or location of work. Further observation is required to understand whether these changes in the households' primary source of income caused by resettlement positively or negatively affect the overall economic structure of the households, including an increase in work opportunities and monthly income. Housing-led urban rehabilitation will not be sustainable in the long term if people living in the slums, whether they are long-term residents or newcomers, are relocated far away from their source of income and employment opportunities.

Table 3. Percentage of households reporting changes in work (the primary source of income) after shifting to their current location.

	No Change	Change in Type of Work	Change in Location of Work
Shivneri	45.45	48.48	6.06
Santacruz	54.46	41.58	3.96
Bhoiwada	47.96	30.61	21.43

5.2. Housing Quality and Facilities

Literature pointed out that, in general, housing quality in the social housing and resettlement area is significantly increased when compared to the slums [61]. Improvements are observed in the amount of daylight, ventilation and privacy received; there is also a considerable increase in the available number of basic amenities such as toilets, parking and open space. In general, social housing built for resettlement has better access to basic municipal services than slums, such as water, sanitation, waste collection, storm drainage, street lighting and emergency access. Table 4 shows households' satisfaction regarding housing quality and well-being, comparing their experience living in the slums and after relocating to social housing.

Table 4. Percentage of households reporting housing quality and facilities compared to previous residences.

	Waste Management	Cleanliness	Safety	Lift	Passage	Terrace
No change	23.67	17.67	12.67	N/A	N/A	N/A
Improved	74.00	82.00	86.67	89.33	64.33	29.00
Worsened	2.33	0.33	0.67	10.67	35.67	71.00

Note: Not available (N/A).

When we studied waste management, the following interesting facts came into the picture. Across the observed social housing, 64 per cent mentioned that shared outdoor passageways have improved, while the rest considered them to be worse than what they used to have in the slums. This means resettlement and rehabilitation do not always respond to the socio-cultural aspects to a great extent. Social housing constructed under the housing-led urban regeneration scheme is functional and practical. Still, providing public spaces such as passages, while well-built, is not conducive to active social life. In slums, the passage in front of the houses functions as a space of interaction due to the proximity and the multi-functionality of the space. In social housing, such interaction is less generated because of the single-functionality and design of the passage. Dwellers can be further isolated from their surroundings and have less attachment to outside space.

6. Conclusions

The study attempts to explore the different aspects of well-being in determining the housing satisfaction of the residents of social housing under the slum rehabilitation schemes in Mumbai. The findings show that an array of attributes attached to social and environmental factors, income generation and infrastructure influences the household's overall housing satisfaction. The study found that economic opportunity is low in the slum rehabilitation, mostly reflected in the job loss of the second earner, exacerbated by the change of work after shifting to social housing. In our case study, location plays the most critical role in deciding the households' satisfaction regarding the affordability of social housing compared to slums. Therefore, to achieve considerable economic sustainability in the slum rehabilitation project, in situ development of slums should be promoted.

The implications of our findings are that sustainable social housing under the slum rehabilitation scheme needs to address the issues relevant to the built environment and housing amenities. Social housing offers considerably improved social and environmental sustainability components compared to slums. Households' perception of their overall well-being by living in social housing is high in terms of the built environment and housing amenities. The analysis shows that physical features greatly affect dwellers' satisfaction with social housing. In this study, we argue that while the built environment and housing amenities have greatly improved, they are still lacking in accommodating the socio-cultural aspects and higher economic opportunities of all the household members. Leverage effects of socio-cultural aspects on community acceptance vis-a-vis housing satisfaction should be more effectively harnessed with supporting measures, especially with regard to social satisfaction. This includes improving design adaptability that accommodates social interaction such as shared spaces, i.e., passages and quasi-open spaces (terraces). Future studies need to include essential housing characteristics, such as the residents' specific preferences for visualisation aspects and the broader context they live in, i.e., characteristics of quality neighbourhoods. The determinants from our community acceptance model can be expanded and contextualised to social housing projects, especially in cities in developing countries.

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Data Availability Statement: The data presented in this article are available on request from the corresponding author. The data are not publicly available due to the sensitivity of the data.

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Appendix A

Table A1. Summary statistics.

Variable	Mean	Std. Dev.	Min	Max
Community acceptance	0.813	-	0	1
Accessibility of the building				
Deteriorated	0.407	-	0	1
Remain same	0.357	-	0	1
Improved	0.237	-	0	1
Living expenses				
Reduced	0.253	-	0	1
Same	0.320	-	0	1
Increased	0.007	-	0	1
Community engagement				
Improved	0.343	-	0	1
Same	0.610	-	0	1
Reduced	0.047	-	0	1
Location				
Shivneri	0.330	-	0	1
Santacruz	0.333	-	0	1
Bhoiwada	0.333	-	0	1
Age	48.237	11.632	24	80
Household Head Male	0.843	-	0	1
Household Size	5.527	2.410	1	18
Frequency of Garbage Collection in a week	2.743	1.570	1	6

Table A2. Analysis of variance (ANOVA).

Source	Partial SS	df	MS	F	Prob > F
Model	3.018791	17	0.177576	1.18	0.2821
Accessibility of the building	0.381415	2	0.190707	1.26	0.284
Living expenses	0.098057	3	0.032686	0.22	0.8848
Community engagement	0.681001	2	0.3405	2.26	0.1065
Age	0.039067	1	0.039067	0.26	0.6112
Location	1.303549	2	0.651774	4.32	0.0142
Household Head Male	2.58×10^{-5}	1	2.58×10^{-5}	0	0.9896
HH size	0.167432	1	0.167432	1.11	0.2929
Garbage collection (frequency)	0.565037	5	0.113007	0.75	0.5872
Residual	42.52788	282	0.150808		
Total	45.54667	299	0.15233		
Number of observations = 300					
Adjusted R-square = 0.0100					

References

1. Huby, M.; Huby, D. *Social Policy and the Environment*; Open University Press: Maidenhead, UK, 1998.
2. Scott, M. *Renewing Urban Communities: Environment, Citizenship and Sustainability in Ireland*; Taylor & Francis: London, UK, 2017.
3. Lucon, O.; Ürge-Vorsatz, D.; Ahmed, A.Z.; Akbari, H.; Bertoldi, P.; Cabeza, L.F.; Eyre, N.; Gadgil, A.; Harvey, L.D.; Jiang, Y. Chapter 9—Buildings. In *Climate Change 2014: Mitigation of Climate Change. IPCC Working Group III Contribution to AR5*; Cambridge University Press: Cambridge, UK, 2014.
4. Bennett, A.; Cuff, D.; Wendel, G. Backyard Housing Boom: New Markets for Affordable Housing and the Role of Digital Technology. *Technol. Des.* **2019**, *3*, 76–88. [CrossRef]
5. Gordillo, F.; Hernández, N. Sustainable Urban Housing. Strategies for Implementation in Bogotá. Poster Presented at the Fourth World Sustainable Building. 2014; pp. 28–30. Available online: http://wsb14barcelona.org/programme/pdf_poster/P-087.pdf (accessed on 30 March 2022).
6. Zhao, D.-X.; He, B.-J.; Johnson, C.; Mou, B. Social Problems of Green Buildings: From the Humanistic Needs to Social Acceptance. *Renew. Sustain. Energy Rev.* **2015**, *51*, 1594–1609. [CrossRef]
7. Haque, A.N.; Lemanski, C.; De Groot, J. Why Do Low-Income Urban Dwellers Reject Energy Technologies? Exploring the Socio-Cultural Acceptance of Solar Adoption in Mumbai and Cape Town. *Energy Res. Soc. Sci.* **2021**, *74*, 101954. [CrossRef]
8. United Nations Commission on Sustainable Development. *Indicators of Sustainable Development: Framework and Methodologies*; United Nations: New York, NY, USA, 1996.
9. Commission of the European Communities. *Sustainable Development Indicators to Monitor the Implementation of the EU Sustainable Development Strategy*; Communication from Commissioner Almunia to Members of the European Commission; Commission of the European Communities: Brussels, Belgium, 2005.
10. Saidu, A.I.; Yeom, C. Success Criteria Evaluation for a Sustainable and Affordable Housing Model: A Case for Improving Household Welfare in Nigeria Cities. *Sustainability* **2020**, *12*, 656. [CrossRef]
11. Wixom, B.H.; Todd, P.A. A Theoretical Integration of User Satisfaction and Technology Acceptance. *Inf. Syst. Res.* **2005**, *16*, 85–102. [CrossRef]
12. Kshetrimayum, B.; Bardhan, R.; Kubota, T. Factors Affecting Residential Satisfaction in Slum Rehabilitation Housing in Mumbai. *Sustainability* **2020**, *12*, 2344. [CrossRef]
13. Vaid, U.; Evans, G.W. Housing Quality and Health: An Evaluation of Slum Rehabilitation in India. *Environ. Behav.* **2016**, *49*, 771–790. [CrossRef]
14. World's Population Review. Mumbai Population. 2022. Available online: https://worldpopulationreview.com/world-cities/mumbai-population (accessed on 12 June 2022).
15. Nijman, J. Against the Odds: Slum Rehabilitation in Neoliberal Mumbai. *Cities* **2008**, *25*, 73–85. [CrossRef]
16. Bardhan, R.; Sarkar, S.; Jana, A.; Velaga, N.R. Mumbai Slums since Independence: Evaluating the Policy Outcomes. *Habitat Int.* **2015**, *50*, 1–11. [CrossRef]
17. Sunikka-Blank, M.; Bardhan, R.; Haque, A.N. Gender, Domestic Energy and Design of Inclusive Low-Income Habitats: A Case of Slum Rehabilitation Housing in Mumbai, India. *Energy Res. Soc. Sci.* **2019**, *49*, 53–67. [CrossRef]
18. Malik, J.; Bardhan, R.; Hong, T.; Piette, M.A. Developing Occupant Archetypes within Urban Low-Income Housing: A Case Study in Mumbai, India. *Build. Simul.* **2022**, *15*, 1661–1683. [CrossRef]

19. Debnath, R.; Bardhan, R.; Sunikka-Blank, M. Discomfort and Distress in Slum Rehabilitation: Investigating a Rebound Phenomenon Using a Backcasting Approach. *Habitat Int.* **2019**, *87*, 75–90. [CrossRef] [PubMed]
20. Malik, J.; Bardhan, R. Energy Target Pinch Analysis for Optimising Thermal Comfort in Low-Income Dwellings. *J. Build. Eng.* **2020**, *28*, 101045. [CrossRef]
21. Malik, J.; Bardhan, R. Thermal Comfort Perception in Naturally Ventilated Affordable Housing of India. *Adv. Build. Energy Res.* **2022**, *16*, 385–413. [CrossRef]
22. Lueker, J.; Bardhan, R.; Sarkar, A.; Norford, L. Indoor Air Quality among Mumbai's Resettled Populations: Comparing Dharavi Slum to Nearby Rehabilitation Sites. *Build. Environ.* **2020**, *167*, 106419. [CrossRef]
23. Wüstenhagen, R.; Wolsink, M.; Bürer, M.J. Social Acceptance of Renewable Energy Innovation: An Introduction to the Concept. *Energy Policy* **2007**, *35*, 2683–2691. [CrossRef]
24. Tabi, A.; Wüstenhagen, R. Keep It Local and Fish-Friendly: Social Acceptance of Hydropower Projects in Switzerland. *Renew. Sustain. Energy Rev.* **2017**, *68*, 763–773. [CrossRef]
25. Kosorić, V.; Huang, H.; Tablada, A.; Lau, S.-K.; Tan, H.T.W. Survey on the Social Acceptance of the Productive Façade Concept Integrating Photovoltaic and Farming Systems in High-Rise Public Housing Blocks in Singapore. *Renew. Sustain. Energy Rev.* **2019**, *111*, 197–214. [CrossRef]
26. Yuan, X.; Zuo, J.; Ma, C. Social Acceptance of Solar Energy Technologies in China—End Users' Perspective. *Energy Policy* **2011**, *39*, 1031–1036. [CrossRef]
27. Kalantari, F.; Akhyani, N. Community Acceptance Studies in the Field of Vertical Farming—A Critical and Systematic Analysis to Advance the Conceptualisation of Community Acceptance in Kuala Lumpur. *Int. J. Urban Sustain. Dev.* **2021**, *13*, 569–584. [CrossRef]
28. Kalantari, F.; Tahir, O.M.; Joni, R.A.; Fatemi, E. Opportunities and Challenges in Sustainability of Vertical Farming: A Review. *J. Landsc. Ecol.* **2018**, *11*, 35–60. [CrossRef]
29. Hernandez-Roman, F.; Sheinbaum-Pardo, C.; Calderon-Irazoque, A. "Socially Neglected Effect" in the Implementation of Energy Technologies to Mitigate Climate Change: Sustainable Building Program in Social Housing. *Energy Sustain. Dev.* **2017**, *41*, 149–156. [CrossRef]
30. McCabe, A.; Pojani, D.; Van Groenou, A.B. The Application of Renewable Energy to Social Housing: A Systematic Review. *Energy Policy* **2018**, *114*, 549–557. [CrossRef]
31. Moore, N.; Haines, V.; Lilley, D. Improving the Installation of Renewable Heating Technology in UK Social Housing Properties through User Centred Design. *Indoor Built Environ.* **2015**, *24*, 970–985. [CrossRef] [PubMed]
32. Hanger, S.; Komendantova, N.; Schinke, B.; Zejli, D.; Ihlal, A.; Patt, A. Community Acceptance of Large-Scale Solar Energy Installations in Developing Countries: Evidence from Morocco. *Energy Res. Soc. Sci.* **2016**, *14*, 80–89. [CrossRef]
33. Tsoka, S.; Tsikaloudaki, K.; Theodosiou, T.; Dugue, A. Rethinking User Based Innovation: Assessing Public and Professional Perceptions of Energy Efficient Building Facades in Greece, Italy and Spain. *Energy Res. Soc. Sci.* **2018**, *38*, 165–177. [CrossRef]
34. Nair, D.G.; Enserink, B.; Gopikuttan, G.; Vergragt, P.; Fraaij, A.; Dalmeijer, R. A Conceptual Framework for Sustainable–Affordable Housing for the Rural Poor in Less Developed Economies. In Proceedings of the 2005 World Sustainable Building Conference, Tokyo, Japan, 27–29 September 2005. (SB05Tokyo).
35. Bhattacharya, K.P. Affordable Housing, Infrastructure and Urban Development: Seventh International Congress on Human Settlements in Developing Countries, Calcutta, India, 4–6 November, 1993. *Habitat Int.* **1994**, *18*, 99–101. [CrossRef]
36. Tiwari, P.; Hasegawa, H. Demand for Housing in Tokyo: A Discrete Choice Analysis. *Reg. Stud.* **2004**, *38*, 27–42. [CrossRef]
37. Manna, D.; Banerjee, S. A Review on Green Building Movement in India. *Int. J. Sci. Technol. Res.* **2019**, *8*, 1980–1986.
38. Roy, A.U.K.; Roy, M.; Saha, S. Energy Optimization through Open-Industrialised Building System in Mass Housing Projects. In *Indian Buildings Congress*; 2009; pp. 1–8. Available online: https://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.494.5914 (accessed on 30 March 2022).
39. Herda, G.; Rani, S.; Caleb, P.R.; Gupta, R.; Behal, M.; Gregg, M.; Hazra, S. Sustainable Social Housing in India. 2017. Available online: https://unhabitat.org/sites/default/files/documents/2019-05/sustainable_social_housing_in_india.pdf (accessed on 30 March 2022).
40. Niroumand, H.; Zain, M.F.M.; Jamil, M. A Guideline for Assessing of Critical Parameters on Earth Architecture and Earth Buildings as a Sustainable Architecture in Various Countries. *Renew. Sustain. Energy Rev.* **2013**, *28*, 130–165. [CrossRef]
41. Chippagiri, R.; Gavali, H.R.; Ralegaonkar, R.V.; Riley, M.; Shaw, A.; Bras, A. Application of Sustainable Prefabricated Wall Technology for Energy Efficient Social Housing. *Sustainability* **2021**, *13*, 1195. [CrossRef]
42. Bardhan, R.; Debnath, R.; Jana, A.; Norford, L.K. Investigating the Association of Healthcare-Seeking Behavior with the Freshness of Indoor Spaces in Low-Income Tenement Housing in Mumbai. *Habitat Int.* **2018**, *71*, 156–168. [CrossRef]
43. Cronin, V. A Sustainability Evaluation of Slum Rehabilitation Authority Housing Development at Nanapeth, Pune, India. *Environ. Urban. ASIA* **2013**, *4*, 121–134. [CrossRef]
44. Ministry of Housing and Urban Poverty Alleviation. *Annual Report 2011-12*; Ministry of Housing & Urban Poverty Alleviation, Government of India: New Delhi, India, 2012.
45. Bardhan, R.; Debnath, R.; Malik, J.; Sarkar, A. Low-Income Housing Layouts under Socio-Architectural Complexities: A Parametric Study for Sustainable Slum Rehabilitation. *Sustain. Cities Soc.* **2018**, *41*, 126–138. [CrossRef]

46. Singh, C.; Madhavan, M.; Arvind, J.; Bazaz, A. Climate Change Adaptation in Indian Cities: A Review of Existing Actions and Spaces for Triple Wins. *Urban Clim.* **2021**, *36*, 100783. [CrossRef]
47. Ministry of Housing and Urban Affairs. Pradhan Mantri Awas Yojana-Urban. Available online: https://pmaymis.gov.in/ (accessed on 31 March 2022).
48. Mukhija, V. *Squatters as Developers? Slum Redevelopment in Mumbai*, 1st ed.; Routledge: London, UK, 2003. [CrossRef]
49. Liu, W.; Wang, C.; Mol, A.P.J. Rural Public Acceptance of Renewable Energy Deployment: The Case of Shandong in China. *Appl. Energy* **2013**, *102*, 1187–1196. [CrossRef]
50. Aragonés, J.I.; Amérigo, M.; Pérez-López, R. *Residential Satisfaction and Quality of Life BT—Handbook of Environmental Psychology and Quality of Life Research*; Fleury-Bahi, G., Pol, E., Navarro, O., Eds.; Springer International Publishing: Cham, Switzerland, 2017; pp. 311–328. [CrossRef]
51. Diener, E.; Suh, E.; Oishi, S. Recent Findings on Subjective Well-Being. *Indian J. Clin. Psychol.* **1997**, *24*, 25–41.
52. Hassine, K.; Marcouyeux, A.; Annabi-Attia, T.; Fleury-Bahi, G. Measuring Quality of Life in the Neighborhood: The Cases of Air-Polluted Cities in Tunisia. *Soc. Indic. Res.* **2014**, *119*, 1603–1612. [CrossRef]
53. Habitat for Humanity. Global Housing Indicators: Evidence for Action. 2012. Available online: https://www.globalurban.org/Global_Housing_Indicators_report.pdf (accessed on 30 March 2022).
54. Chohan, A.H.; Che-Ani, A.I.; Shar, B.K.; Awad, J.; Jawaid, A.; Tawil, N.M. A Model of Housing Quality Determinants (HQD) for Affordable Housing. *J. Constr. Dev. Ctries* **2015**, *20*, 117.
55. Wallbaum, H.; Ostermeyer, Y.; Salzer, C.; Zea Escamilla, E. Indicator Based Sustainability Assessment Tool for Affordable Housing Construction Technologies. *Ecol. Indic.* **2012**, *18*, 353–364. [CrossRef]
56. Yuan, X.; Zuo, J.; Huisingh, D. Social Acceptance of Wind Power: A Case Study of Shandong Province, China. *J. Clean. Prod.* **2015**, *92*, 168–178. [CrossRef]
57. Rezaee, E.D.; Kalantari, F. Proposal of an Operational Model to Measure Feelings and Emotions in Urban Space. *J. Landsc. Ecol.* **2019**, *12*, 34–52. [CrossRef]
58. Malik, J.; Bardhan, R.; Hong, T.; Piette, M.A. Contextualising Adaptive Comfort Behaviour within Low-Income Housing of Mumbai, India. *Build. Environ.* **2020**, *177*, 106877. [CrossRef]
59. Hemström, K.; Mahapatra, K.; Gustavsson, L. Public Perceptions and Acceptance of Intensive Forestry in Sweden. *Ambio* **2014**, *43*, 196–206. [CrossRef] [PubMed]
60. Paul, P.; Pennell, M.L.; Lemeshow, S. Standardizing the Power of the Hosmer–Lemeshow Goodness of Fit Test in Large Data Sets. *Stat. Med.* **2013**, *32*, 67–80. [CrossRef] [PubMed]
61. Sheth, A.Z.; Velaga, N.R.; Price, A.D.F. Slum Rehabilitation in the Context of Urban Sustainability: A Case Study of Mumbai, India. In Proceedings of the SUE-MoT: 2nd International Conference on Whole Life Urban Sustainability and Its Assessment, Loughborough, UK, 22–24 April 2009; Loughborough University: Loughborough, UK, 2009.