



# Technical Assistance Consultant's Report

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## Regional: Advancing Inclusive and Resilient Urban Development Targeted at the Urban Poor

### Knowledge Note: Resilient Housing for Strengthening Resilience of the Urban Poor in Asia

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## Key Points

Climate change presents a major threat to the lives and livelihoods of the urban poor throughout Asia. Housing conditions play a critical role in mediating the extent to which the poor will suffer harm as a result of this.

The location of housing and the quality of housing are both important in this regard. The urban poor often reside in locations that are exposed to a range of climate hazards, largely because of the lack of appropriately located and affordable land. The quality of their homes also fails to protect them from climate shocks such as flooding, high winds, and extreme heat.

Community upgrading – both of housing and of community infrastructure – can play a key role in building the resilience of the urban poor. This will require mainstreaming ideas of climate and disaster risk in both NGO and government programming, and a better provision of data to support plans that address current and future climate-related risk.

Specific responses to build resilience for the urban poor through improved housing could engage with increasing the availability of safe and affordable land; training planners and builders to make structures more resilient; supporting the urban poor to make their own homes more resistant to the shocks and stresses of climate change; and providing them secure tenure.

## A. Introduction: The Relationship Between Housing, Risk and Resilience

1. **Climate change presents a major threat to the lives and livelihoods of low-income urban residents.** The risks that the urban poor face as a result of climate change are shaped both by their exposure to new and worsening hazards, and their vulnerability to harm as a result of these. Housing plays a critical role in mediating both hazards and vulnerability. Low quality housing is more likely to be damaged or destroyed through climate change impacts, while the housing conditions of the urban poor (both the location and the quality of housing) make this group highly susceptible to harm as a result of climate change.

2. This knowledge note explains the potential effects of climate change on the housing of the urban poor and how this will affect this large and growing group of people in Asia, with particular reference to Bangladesh, Indonesia and the Philippines. It identifies existing efforts to make low-income housing more resilient, and – by extension – to build the resilience of the urban poor. It assesses potential responses to further this goal, and identifies the conditions and enabling environments that are necessary to facilitate this.

3. **The housing of the urban poor is often of low quality, and therefore more likely to be damaged or destroyed as a result of the impacts of climate change.** Houses that are built with low-quality materials, or using low-cost measures, are less resilient in the face of climate-related threats such as high wind speed, extreme heat, and flooding. The unaffordability or inaccessibility of safe land for housing, and a consequent need to inhabit marginal areas of cities, is one of the main reasons why the urban poor are highly exposed to climate change. This is often particularly true for recent migrants who often end up living in these locations. The hazards that the urban poor face are shaped by these locational issues, and include coastal and riverine flooding, the effects of storms and cyclones, droughts, and heat waves. Many of these hazards are expected to worsen as a result of climate change.

4. **The vulnerability of the urban poor is largely shaped by the multiple deprivations of poverty.** These include the absence of access to safe housing, the inadequate provision of basic services (including risk-reducing infrastructure), the lack of financial resources to protect against shocks and stresses, poor access to public health, inadequate supply of safe drinking water, and governance and accountability failures that result in exclusion. It is frequently exacerbated by the precarious nature of the informal livelihoods (or poorly paid formal livelihoods) that the urban poor rely on. For a range of reasons, women, girls and boys, older persons, and persons with disability are particularly vulnerable. Vulnerability is also exacerbated by shocks to rural economies that can lead to an increase in the price of key commodities (such as food staples) in urban areas.

5. **This high level of risk is particularly concentrated in informal settlements or slums.** These have been built outside the ‘formal’ system of laws and regulations that are meant to ensure resilient structures, settlements and systems. They are outside the formal system of regulations for recording land acquisition, for acquiring legal land tenure and for getting permission to develop buildings. They are outside the rules and regulations on land-use, buildings and infrastructure and service provision. Most (but not all) are on land that is illegally occupied. Most do not receive the infrastructure and services that should be provided in urban contexts such as reliable, safe water piped to homes, good provision within the household for sanitation, paved roads and paths, storm and surface drains and connection to electricity grids. The quality of housing within slums can have a direct effect on the types of risk that the urban poor face – for example, higher temperatures will disproportionately affect people living in poor quality and un-insulated housing, while vector-borne diseases spread more rapidly in poor-quality living conditions.

6. **COVID-19 has highlighted the need to rethink urban poverty reduction strategies and climate change adaptation actions from a resilience lens, and has emphasized the importance of decent quality housing in building resilience of the urban poor.** The COVID-19 pandemic has required a fundamental reassessment of the nature of risk and resilience around the world, with specific implications for urban areas. The most significant outbreaks of the disease have taken place in towns and cities, and the social and economic implications of 'lockdowns' have been felt most severely in these settings. High residential densities increase the potential for inter-personal transmission, limited water infrastructure limits the ability to practice frequent handwashing, while limited space or facilities to store food (let alone constrained household finances) means that people are unable to purchase stocks of food and therefore need to go outside the home for this more frequently.

7. **The quality of housing has shaped the experiences both of illness and of associated economic hardship as a result of the pandemic.** For example, the response to COVID-19 pandemic in the Philippines immensely affected the urban poor and exposed their deprivations due to lack of adequate and safer housing. Physical distancing inside their densely packed dwellings became impractical and infeasible. Informal arrangements and undocumented housing and rental arrangements makes the urban poor more vulnerable to displacement – which can, in turn, place them in the path of climate-related hazards.

8. **The housing and shelter sector is crucial for adapting to climate change and building resilience for the urban poor.** Well-designed, properly-constructed and appropriately-located housing and shelter can help blunt the impact of extreme heat, reduce the direct impact of flooding and protect people from cyclones: as such, it is crucial for reducing the exposure of the urban poor. As the same time, houses with basic services and security of tenure can help reduce the vulnerability of the people who live in them, and can provide a solid basis for earning resilient livelihoods. Good quality and secure housing should therefore be a central plank of any strategy to help enhance the resilience of the urban poor.

## **B. Housing and Risk for the Urban Poor**

9. **The impact of climate change on housing is crucially important as this has a critical bearing on all aspects of risk for the urban poor.** Access to affordable, adequate, and appropriate shelter is a significant challenge for the urban poor. Expenditure on housing in urban settings (even in poor quality housing) often requires a substantial proportion of earnings, while inadequate housing exposes the urban poor to a range of climate- and disaster related shocks and stresses. Housing located on hazardous land exacerbates the degree to which the urban poor are exposed to climate-related events, while low-quality structures are unable to protect their inhabitants from these shocks and stresses. Conversely, the arrangement and development of housing can also have a bearing on hazards (for example, poorly engineered houses on unstable hill slopes may induce landslides). Housing is also highly important for livelihoods – home-based economic activities are critical for many of the urban poor, particularly women – and without secure livelihoods, the urban poor are unable to contribute significantly to their own resilience. The health of the urban poor is also shaped by the quality of their housing, including the extent to which they are and will be affected by higher temperatures and heat waves.

### **1. Deficiencies in the provision of housing for the urban poor**

10. **These problems are widespread due to the substantial shortfall in affordable housing for the urban poor.** For example, in 2014 Indonesia had an identified shortfall of 7.63

million units, with 700,000 families trying to identify affordable houses<sup>1</sup>. At the same time, a review of housing demand for the period 2016-30 by the Subdivision and Housing Developers Association of the Philippines, indicated that about 1,134,986 households would be unable to afford housing; 1,369,181 would require socialized housing, and 2,509,718 would require economic housing.<sup>2</sup> And in Bangladesh, reports suggest that a housing shortfall of 4.6 million units (for 43.43 million people) in 2010 was expected to have grown to 8.5 million units (for 60 million people) by 2021.<sup>3</sup>

**11. Insecurity of tenure means that low-income groups are unwilling to invest even limited amounts of money in improving the resilience of their homes.** A respondent in a recent study in Bangladesh explained: “we have no other alternative but to live in this vulnerable situation... we cannot afford to move to a better place, and we cannot afford to invest in the housing... even if we can invest some of our small savings, we do not want to... it is very risky as we might be evicted anytime”.<sup>4</sup> While one study identified tenure insecurity as “the biggest source of vulnerability for residents of public settlements” in Bangladesh,<sup>5</sup> other sources suggest that the fear of eviction may be greater than the reality (with only between 4.8 percent and 6.8 percent of households assessed in the baseline survey of the NUPRP having experienced eviction).<sup>6</sup>

**12. The housing shortage is exacerbated by the lack of availability of land.** In larger cities, national and local government capacity to deliver on-site or in-city housing solutions is limited by the scarcity of affordable land. For example, in Metro Manila the National Housing Authority is constrained by its need to rely on local governments to provide land that can be used for its in-city low-rise housing projects<sup>i</sup>. In the absence of this land, the available alternatives are distant off-city resettlement projects which render relocated families economically vulnerable due to the loss of livelihoods and access to needed services. In the worst cases, a lack of participation and a failure to adequately consider scientific data on risk can worsen the situation of residents who have been resettled.

**13. Existing public housing programs do not yet adequately integrate climate and disaster risk.** As new homes are built, it is vital for the government to demonstrate understanding of how climate change can impact housing and integrate necessary adaptation measures, and for housing programs to integrate or ‘mainstream’ climate risk. This is a process of mapping the climate and disaster risk of land parcels on which housing is to be developed to either find alternative sites or undertake design changes on house plans. One factor that drives this risky development is the fact that safe land is frequently more expensive and makes the development of affordable housing less viable.

## 2. Housing conditions and climate change risk

**14. A high proportion of the urban population lives in areas that are defined as slums.** The characteristics of these slums include weak housing structures, high density, land tenure

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<sup>1</sup> Global Construction Review (2019). “Indonesia hits million-home target for first time in 2018”. <http://www.globalconstructionreview.com/news/indonesia-hits-million-home-target-first-time-2018/>

<sup>2</sup> Subdivision and Housing Developers Association (2016). *Statistics for Housing Policy*. <https://psa.gov.ph/sites/default/files/6.6.3%20Statistics%20for%20Housing%20Policy%20.pdf>

<sup>3</sup> International Growth Centre (n.d.). *Research Priorities: Bangladesh*. [https://www.theigc.org/wp-content/uploads/2015/11/Research-Priorities\\_CB5\\_Bangladesh.pdf](https://www.theigc.org/wp-content/uploads/2015/11/Research-Priorities_CB5_Bangladesh.pdf)

<sup>4</sup> Haque A (2020). “A ‘Whole Systems’ View of Vulnerability to Climatic Risks: The Case of the Urban Poor in Dhaka, Bangladesh” *Progress in Development Studies* 20(2). <https://doi.org/10.1177/1464993420908094>

<sup>5</sup> Roy M, Hulme D, Jahan F (2013). “Contrasting adaptation responses by squatters and low-income tenants in Khulna, Bangladesh.” *Environment and Urbanization* 25(1): 157-176.

<sup>6</sup> UNDP (2020). Baseline Survey Report of National Urban Poverty Reduction Programmed (NUPRP).

issues, inadequate access to basic services, poor road facilities, and poor socioeconomic conditions. In some countries, slums are widespread or expanding rapidly – for example, 21% of Indonesia’s population is estimated to live in slums, while according to the Bangladesh Bureau of Statistics, the number of recorded slums in the country grew from 2,991 in 1997 to 13,935 in 2014.<sup>7</sup> Even when they are not living in slums, the urban poor often live in neighborhoods or housing that contribute to high levels of risk (see table). Many settlements housing the urban poor are on land that is exposed to flooding and landslides; most housing structures in these communities are poor quality and lack basic services.<sup>8</sup> For example, a recent study in East Dhaka found 90 percent of respondents living in housing that is highly vulnerable to climatic stress: with 40 percent of households in temporary structures made out of materials such as bamboo, wood, corrugated tin, straw and jute sticks; and a further 50 percent of homes having semi-permanent plinths but temporary wall and roofing material.<sup>9</sup> The result is that most low-income and informal homes and settlements concentrate high levels of risk from infectious and parasitic diseases, accidental fires, extreme weather and pollution.

### Risks Affecting Low-income Urban Housing

Type of Housing	Specific risks	Shared risks
Low-quality housing in formal settlements	Particularly severe challenges from degraded infrastructure	Damage to homes from climate-related and other disasters (due to low quality of shelter)  Risk of injury and death from poor quality housing and limited neighbourhood infrastructure  Public health risks: illness due to poor quality shelter, inadequate ventilation and sanitation
Housing in informal settlements	Particularly severe challenges from lack of infrastructure  Risks accentuated through location on marginal land (e.g., riverbanks, near coast) and poorly constructed housing.	
Resettlement sites	Disrupted support networks and livelihoods	

Source: International Institute for Environment and Development

**15. Poorly constructed homes can be badly affected by heavy rainfall and flooding.** Climate change is expected to cause increases in high intensity rainfall in many places, and when this interacts with built-up urban environments, flooding can result. Inadequate roofing can be destroyed by heavy rain, and houses with limited foundations can be destroyed by flooding. The problem can be compounded in areas with inadequate sanitation systems, as shallow septic pits can overflow, causing floodwater to be contaminated with human effluent and shallow tube wells and open wells can be polluted thereby affecting quality of potable water.

**16. Cyclonic winds and other storms have a severe impact on housing and shelter.** Uplift movement caused by strong winds can pull buildings out of the ground, similarly cyclones can cause catastrophic damage to roofs which in turn can lead to a complete collapse of the building

<sup>7</sup> Government of Bangladesh. Bangladesh Bureau of Statistics (BBS) (2016). *Household Income and Expenditure Survey*, Statistics and Informatics Division (SID), Ministry of Planning.

<sup>8</sup> Adapted from Satterthwaite D, Archer D, Colenbrander S, Dodman D, Hardoy J, Patel S (2018). ‘Responding to climate change in cities and in their informal settlements and economies’ *Paper prepared for the International Scientific Conference on Cities and Climate Change*. Edmonton, March 2018.

<sup>9</sup> Haque A (2020). “A ‘Whole Systems’ View of Vulnerability to Climatic Risks: The Case of the Urban Poor in Dhaka, Bangladesh” *Progress in Development Studies* 20(2). <https://doi.org/10.1177/1464993420908094>



structure.<sup>10</sup> Houses that are elevated from the ground have been seen to tip over and windows and doors can be completely destroyed or damaged. These impacts are mediated both by the strength of the cyclone and the quality of construction.

**17. Housing conditions play an important role in shaping the effects of heat on health for the urban poor.** Dense neighborhoods with little vegetation can cause a worsening of the urban heat island effect, a situation that is worsened inside homes with inadequate insulation or ventilation. Living in low quality housing in crowded settlements with limited open space, and engaging in physically active outdoor occupations (e.g., public transport drivers, construction workers, ambulant vendors) makes the urban poor highly susceptible to harm from extreme temperatures in already heat-stressed cities. One study of four major cities in the Philippines shows how extreme heat and heatwaves affects the risk of mortality among young and male populations,<sup>11</sup> while another study on Manila showed how sustained high temperatures elevate the risk of dying among risk populations, such as elderly persons and women.<sup>12</sup>

**18. Apart from outright destruction, natural hazards and climate change can erode the physical integrity of shelter in a number of ways.** Excess water from extreme precipitation events can lead to leaks and increased rusting of metallic components used in house construction, while saline penetration into reinforced concrete can destroy reinforcement bars and in extreme cases lead to structural collapse. Increased moisture in the air can also lead to increase in the growth of mold within buildings that, in turn could result in serious health impacts on inhabitants. Extreme rainfall can also cause land subsidence that may damage the foundation of any building. Similarly, coastal inundation where seawater impacts the built environment can reduce the strength of many building materials. For instance, salt crystals can form within timber pushing the fibers of the wood apart and eventually causing it to splinter.<sup>13</sup>

### **C. Resilient Housing for the Urban Poor**

**19. Resilient housing for the urban poor needs to take into account the multiple drivers of risk and the shelter priorities for its residents.** Of particular significance are the location of this housing (avoiding exposure to hazards such as sea-level rise, riverine flooding, and rain-induced landslides); and the ability of the structures to resist the harmful impacts of climate change (i.e. to protect residents from harm). However, unless housing is developed in ways that meet the multiple other housing needs of the poor it is not likely to be widely accessible to this group. This means it needs to be provided in locations that enable access to livelihoods and the full range of urban services, including healthcare. It also needs to be affordable, and developed in ways that are incrementally upgradable while retaining structural resilience. This section describes the potential role of household, community and government initiatives in contributing to resilient housing for the urban poor.

**20. Even relatively low-cost modifications to building structures can greatly enhance their resilience.** For instance, locating buildings on land that is not low lying or raising houses on plinths can greatly reduce the risk of inundation by flood water. Treating and coating timber, metal and concrete can enhance their ability to withstand extreme heat as well as extreme rainfall

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<sup>10</sup> Agarwal A (2007). *Cyclone Resistant Building Architecture*. <https://nidm.gov.in/PDF/safety/flood/link2.pdf>

<sup>11</sup> Seposo X, Dang T, Honda Y (2017) "Exploring the effects of high temperature on mortality in four cities in the Philippines using various heat wave definitions in different mortality subgroups", *Global Health Action*, 10:1, DOI: 10.1080/16549716.2017.1368969..

<sup>12</sup> Seposo X, Dang T, Honda Y (2015). "Evaluating the Effects of Temperature on Mortality in Manila City (Philippines) from 2006–2010 Using a Distributed Lag Nonlinear Model," *Int. J. Environ. Res. Public Health* 12(6): 6842-6857

<sup>13</sup> Urbanline (2019). "Does Saltwater Affect Timber?" <https://www.urbanline.com.au/does-saltwater-affect-timber/>



and moisture. A whole range of measures and guidelines have been devised to increase the ability of housing to withstand cyclone risk ranging from new methods of fastening roofs to walls to ensuring that walls are able to withstand high wind speeds. Similarly, the design of houses (including internal woven mat ceilings, painting the outside of the roof white, and improving ventilation) can help keep their internal temperature low, eradicate the need for artificial cooling and reduce energy use. These measures need not be expensive, as examples from many countries indicate that small sums of money invested in technical design changes can greatly enhance the resilience building structures.<sup>14</sup>

**21. While resettlement projects often have negative side-effects (such as removing people from livelihood opportunities and social networks), there are positive examples of how these have contributed to resilience.** For example, community-led resettlement of riverbank communities in Bengawan Solo River in Indonesia can be considered as a successful example. The relocation process was undertaken as a response to the 2007 flooding that hit the city and damaged 6,368 houses. In partnership with civil society organizations, the city government of Surakarta initiated a participatory approach for resettlement. This entailed organizing the communities to be resettled, entrusting them with managing financing and collectively purchasing the land on which resettlement is to take place. This process has resulted in the relocation of 1,571 households from the Bengawan Solo Riverbank to form new communities in more than 10 locations that are less at risk of the impacts of climate change.<sup>15</sup>

#### 1. Household and community responses

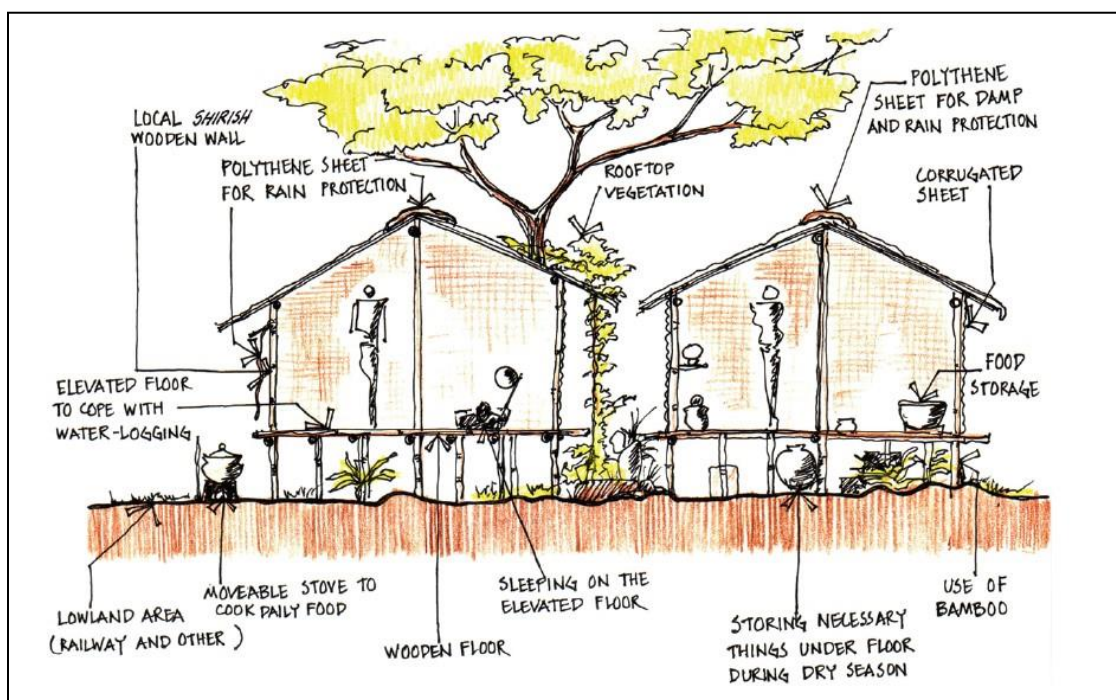
**22. Providing the urban poor with more resilient housing needs to be based on a recognition that most housing for the poor is self-built and incremental.** Security of tenure, provision of basic services, and cost are particularly significant issues in making housing suitable for the poor – and strategies to make housing more resilient need to take these issues into account. Low-income urban residents already make a range of efforts to improve their housing quality, but there are limits as to how much this can contribute to resilience. These modifications include building on stilts or elevated platforms, keeping valuables safe on elevated shelves, and allowing rooftop vegetation to grow as insulation (see figure on page 7).

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<sup>14</sup> Tran P, Tran T, Tran A (2014). "Sheltering From a Gathering Storm: Typhoon Resilience in Vietnam" [https://cdkn.org/wp-content/uploads/2014/07/ISET2014\\_Sheltering\\_VN-Case-Study\\_140429.pdf](https://cdkn.org/wp-content/uploads/2014/07/ISET2014_Sheltering_VN-Case-Study_140429.pdf)

<sup>15</sup> Taylor J (2013). "When non-climate urban policies contribute to building urban resilience to climate change: lessons learned from Indonesian cities" IIED Working Paper: <https://pubs.iied.org/10630IIED>

## Housing adaptation by informal residents in Khulna, Bangladesh



Source: Haque A, Dodman D, Hossain M (2014). "Individual, communal and institutional responses to climate change by low-income households in Khulna, Bangladesh." *Environment and Urbanization* 26.1 (2014): 112-129.

23. **Security of tenure can incentivize the urban poor to invest in resilience.** Structure-owners are more likely to invest in adaptations to their home than tenants who rent rooms or buildings and therefore lack permanency.<sup>ii</sup> Landlords may mediate their tenants' access to external institutions, which can hamper the tenants' ability to strengthen their adaptive capacity; while landlords may not be inclined to undertake the necessary investments to adapt structures and communities to climate change impacts. Therefore, institutions working with residents of informal settlements need to recognize and plan for the variety of tenure situations over land and housing and frame responses accordingly – which means that there will be no blanket solution even within individual settlements, and landlords within informal settlements also need to be engaged with.

24. **NGO-led programs have contributed to more resilient housing for the urban poor but are unlikely to reach the scale of meeting the extensive needs in cities.** For example, in Bangladesh, BRAC Urban Development Programme (UDP) is carrying out small scale affordable housing projects amongst the urban poor, with a high level of community participation in every aspect of implementation and monitoring. As there are a good number of construction workers from each community, BRAC UDP involves them in the construction process along with the house owners. To ensure the standard of construction, UDP organizes mason training – an essential element of ensuring that the houses are properly built and more resilient to climate and disaster risk. In the Philippines, various CSOs are active in assisting informal settler families to developing alternative housing solutions such as on-site or in-city housing instead of distant resettlement through people's planning and/or savings and community-managed funds for improved and secure housing. Moreover, networks of non-government organizations and people's organizations have integrated community-based disaster risk reduction and management including response and relief mechanisms in their capacity building programs in low-income urban

communities. Throughout the region, microfinance institutions (MFIs) offer housing loans to ISFs for house construction and improvement and for small businesses.

## 2. Government initiatives to improve housing for the urban poor

25. **Governments have implemented a wide range of policies and provisions to improve housing conditions for the urban poor.** At the broadest level, policies are divided between those that aim to upgrade slum settlements, provide new housing units for the poor, and resettle communities in hazard prone areas.

26. **Indonesia has a rich history of policies and programs focused on the provision of public housing.** The Kampung Improvement Program (KIP) ran for close to 25 years starting in 1969 and improved the lives of over 15 million residents in urban areas across the country through the provision of improved community infrastructure and basic services which, in turn, stimulated significant improvements in housing. The *Program Penanggulangan Kemiskinan di Perkotaan* (P2KP) ran from 1996 to 2006 and developed community-based institutions at the neighborhood level as a path to sustainable poverty reduction. This transitioned into *Program Nasional Pemberdayaan Masyarakat (PNPM) Mandiri – Perkotaan* (2007-2014) that carried the emphasis on poverty alleviation forward but also focused on slum upgrading. Currently, the KOTAKU program aims to meet the housing needs of the urban poor. Run by the Ministry of Public Works and Human Settlements, this initiative that started in 2016 aims to deliver 100% access to drinking water and sanitation and work towards slum free cities. Between 2015 and 2018, the program successfully improved 23,407 hectares of slums across the country. Even though climate risk was not explicitly considered within this program, improved drainage, access to drinking water and improved structural resilience of housing units delivered by this program help the urban poor deal with a variety of climate induced shocks and stresses.

27. **In Bangladesh, the Government’s National Housing Policy outlines several key principles towards housing the urban poor:** (i) prioritize the urban poor to receive the advantages of housing programs where different prices will be offered at the level of their affordability; (ii) develop suitable financial institutions and associated legal frameworks to mobilize funds for housing through personal savings and other financial inputs; and (iii) develop new strategies, and revisions to existing housing policies, over time to cope with the emerging housing needs in the country – although this is still a policy, rather than an implementable program of work. The National Housing Authority (NHA) under Ministry of Housing and Public Works is the highest Government body to undertake housing projects for both low-income and middle-income communities across the urban canterers of Bangladesh. The NHA has incorporated climate change considerations into housing design through developing a modified “code of practice” in this regard. However, specific government projects to provide housing for the urban slum dwellers are limited in number and extent.

28. **In the Philippines, the Department of Human Settlements and Urban Development (DHSUD) is the primary national government agency charged with managing housing, human settlements and urban development.** Established in February 2019, the DHSUD has a significant role in building resilience for the urban poor. DHSUD has the mandate to formulate policies, undertake programs and projects anchored on the thrusts of Philippines’ New Urban Agenda and National Urban Development and Housing Framework.<sup>16</sup> It aims to contribute to building resilience for the urban poor through integrating disaster risk reduction and climate change in land and urban planning, urban environment and infrastructure improvements serve as

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<sup>16</sup> Government of the Philippines. Republic Act No. 11201. Implementing Rules and Regulations. Section 7.

its major strategies.<sup>17</sup> Existing government housing programs in the Philippines are significantly targeted at informal settlers: for example, the Philippine Development Plan 2017-2022 emphasizes the need to address the needs of families identified for resettlement, including those who live in precarious areas (e.g. along waterways, rail tracks, garbage dumps). The programs and projects covered in this sector by the Philippine Development Plan also explicitly address issues such as settlement upgrading, resiliency and vulnerability reduction, vertical housing development and community-driven shelter programs – many of which are relevant to building resilience of the urban poor through improving the quality of their housing. These efforts are supported by a range of donor-funded and NGO implemented housing programs for the urban poor, such as community-driven housing supported by the Community-led Infrastructure Finance Facility (CLIFF).<sup>18</sup>

#### **D. Strategies for Making Low-income Housing More Resilient**

**29. Despite the efforts above, a large number of the urban poor continue to live in housing that is vulnerable to the effects of climate change, and that contributes to the vulnerability of the people who live in it. This is a multidimensional challenge, which will require multidimensional and integrated solutions.** International examples provide some insights on how resilient housing can be developed for the urban poor. City governments have improved access to better and more resilient housing by increasing the supply and reducing the cost of the key components, including land and permits, building, materials, connection to infrastructure (water, sanitation, drainage, and electricity), and services. National governments have developed policies or programs to reduce the cost of land with legal tenure, provide subsidized housing finance, encourage firms to build cheaper “formal” housing, and encourage banks to develop affordable loan programs. This section identifies several specific approaches that can be pursued to ensure that the housing of the urban poor is more resilient.

**30. For most informal settlements, the cheapest and most effective way to build resilience to climate change impacts is to support residents and their community organizations to work with local governments to implement upgrading programs.** This has become commonplace in some regions (in much of Latin America, upgrading is regarded as a conventional part of local government policy).<sup>19</sup> Comprehensive community-led upgrading, such as that led by organizations including CODI (in Thailand) and networks of slum-dwellers (in a range of countries) can form a strong basis for assessing current risks and anticipating future risks.<sup>20</sup> Upgrading while retaining high levels of density is also significant in ensuring residents are able to access livelihoods and social networks. Examples of plans that do this can be seen in Karachi, Pakistan, which ensure that street-level activities and local amenities are supported as well as multi-storey housing.<sup>21</sup> Low-cost housing can also be designed in ways that specifically takes local climate hazards into account. For example, projects in Vietnam have designed and

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<sup>17</sup> Habitat III. The Philippine National Report. September 2016. New Urban Agenda 2 and 3. [http://habitat3.org/wp-content/uploads/National-Report\\_Philippines.pdf](http://habitat3.org/wp-content/uploads/National-Report_Philippines.pdf)

<sup>18</sup> Community Led Infrastructure Finance Facility (CLIFF): <https://www.gov.uk/guidance/community-led-infrastructure-finance-facility-cliff#:~:text=Print%20this%20page-,>

<sup>19</sup> Rojas E (2018), “ ‘No time to waste’ in applying the lessons from Latin America’s 50 years of housing policies”, *Environment and Urbanization* Vol 31, No 1, pages 177–192.

<sup>20</sup> Satterthwaite D, Archer D, Colenbrander S, Dodman D, Hardoy J, Mittin D, Patel S. (2020). “Building resilience to climate change in informal settlements”. *One Earth*, 2(2), 143-156.

<sup>21</sup> See [www.urbandensity.org](http://www.urbandensity.org)

built houses that are more resilient to storms; projects in Pakistan have adapted structures to manage high levels of heat; and houses in India have been made more flood-resilient.<sup>22</sup>

**31. Responding to climate change will require alternative models for delivering upgrading and resettlement.** Current approaches for resettlement and upgrading suffer from an uneven amount of public participation and this in turn, contributes to a number of challenges. A more concerted effort is needed to ensure that the views and priorities of the urban poor are taken on board within all such programs to a greater degree through iterative, multi stakeholder dialogues that attempt to include the views of the full spectrum of the urban poor (with a particular focus on gender dimensions)<sup>23</sup> through the institution of robust community organizations. New models and approaches such as community led resettlement and land purchase initiatives and in-situ participatory redevelopment of resilient housing should also be actively considered. A good example of an approach that can be scaled up comes from the *Baan Mankong* Collective Housing Program that was started in Thailand in 2003.<sup>24</sup> The program channels government funds, in the form of infrastructure subsidies and soft housing and land loans, directly to poor communities. The communities then plan and carry out improvements to their housing, environment, basic services and tenure security while managing the budget themselves. The process entails close collaboration between poor communities, local governments, professionals and NGOs to ensure that the housing needs of poor communities are considered in broader urban development processes.

**32. Guidance needs to be provided to support more resilient construction practices in housing for the urban poor.** Informal builders play a major role in constructing houses and upgrading slums, and could be trained in climate resilient building practices. There are numerous examples of this from around the world, including from the seismically active region of Gujarat, India where the government undertook the large-scale training of informal builders and masons in earthquake resistant building techniques.<sup>25</sup> Moreover, the institution of regional regulations and their enforcement at the city level for ensuring that building designs take climate risk into account could provide strong incentives for mainstreaming climate risk in housing development.

**33. The expansion of resilient housing for the urban poor should be supported through the crafting of national resilient housing frameworks.** Aside from setting standards for resilient and affordable housing, these frameworks could support policies towards the harmonization of procedures and requirements of existing resettlement and social housing programs. A participatory planning process allows for a more holistic approach for building the resilience of urban poor families who are subjected to eviction/resettlement due to climate risks or infrastructure projects by addressing livelihood, health, gender and climate issues in an integrated fashion. However, existing housing programs and policies often do not accommodate the community organizing process involved in the participatory approaches due to time and cost

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<sup>22</sup> Moench M, Khan F, MacClune K, Amman C, Tran P, Hawley K, & Sheltering from a Gathering Storm Research Team. (2017). "Transforming vulnerability: shelter, adaptation, and climate thresholds". *Climate and Development*, 9(1), 22-35.

<sup>23</sup> Differences in household composition can affect the vulnerability of the urban poor. Female-headed households are often more vulnerable, as are widows and divorced women who are usually marginalized or stigmatized. Urban women, especially the poor, are typically more affected by a range of inequalities such as access to decent work, asset ownership, mobility, personal safety, and representation in formal structures of urban governance which can increase their vulnerability. (ADB. 2022. *Regional: Advancing Inclusive and Resilient Urban Development Targeted at the Urban Poor, Building Resilience of the Urban Poor: Incorporating Climate and Disaster Risk Information into Pro-Poor Housing Investments*. Consultant's report. Manila (Project Number 51325-001).

<sup>24</sup> Boonyabancha S (2009). "Land for housing the poor—by the poor: experiences from the Baan Mankong nationwide slum upgrading programme in Thailand". *Environment and Urbanization*, 21(2), pp.309-329.

<sup>25</sup> Shaw R, Izumi T (2014). *Civil society organization and disaster risk reduction*. Japan: Springer



reasons. Climate information, hazard and vulnerability assessments are also not always integrated into the people's plans. There is thus an opportunity for technical assistance and capacity building to be provided to housing agencies as well as NGOs and community organizations in harmonizing people's planning processes with the procedures and policies of housing programs directed at the urban poor and integrating climate information and vulnerability assessments into these.

**34. Climate and disaster risk need to be mainstreamed across upgrading and housing programs.** The provision of improved housing, either through new housing development or slum upgrading programs must take climate and disaster risk into account. This means that government agencies leading these programs need to institute processes to map the risks that affect target communities using scientific (e.g. satellite remote sensing) and participatory (e.g. community surveys) approaches (ensuring that communities are equal partners in the process, and not merely collectors of data). These programs must be organized to bring about reductions in exposure (e.g. through ensuring that dwelling units are based on plinths to reduce risk from floods), vulnerability (e.g. through the provision of improved water and sanitation) and hazards (e.g. by ensuring that new construction does not contribute to destabilizing slopes and increasing landslide risk). This in turn would result in the development of 'adaptive housing' where units are built to withstand climate impacts through structural adaptations that can include the use of new building materials (e.g. to withstand the impact of heat or moisture), elevated storage spaces (e.g. to ensure that important assets and documents are not impacted by flood events), passive cooling systems (e.g. to ameliorate the risk of extreme heat) and rain water harvesting systems (e.g. to reduce the risk of water scarcity). Some of this is already being done – the *Perda Rumah Panggung* program has mandated the use of stilts for houses built for riverbank communities in Banjarmasin, Indonesia.

**35. Many of the urban poor are ineligible for public housing because they lack proper documentation or otherwise fail to meet eligibility criteria – hence pushing them into poor quality housing.** Changes in the rules and protocols to expand the eligibility criteria, the options for documents that need to be furnished and reduce the minimum required amount of time for families to be considered as residents of the area, would help include a larger number of at risk populations within these vital schemes and programs. Similarly, information about beneficiaries of social protection schemes can be used to help target housing provision more effectively at those who are most at need and most exposed to hazards.

## **E. Enabling Environment for More Resilient Housing**

**36.** Resilient housing for the urban poor cannot be developed in a vacuum, but requires a supportive enabling environment. Critical elements of this are governance, data, and finance. At the same time, housing projects and programs need to integrate gender and participatory principles at all stages to ensure that they respond to the needs of the full range of intended beneficiaries.

### **1. Governance**

**37. Governance is arguably the single most important enabler for enhancing the resilience of the urban poor.** Governance that supports more resilient housing for the urban poor needs to demonstrate the following features:

- **Includes a wide range of stakeholders.** The priorities for allocating resources – including resources that create more resilient housing – need to be decided on through a multi-

stakeholder process that involves all groups as equal partners. This is particularly important in terms of allocating land for housing for the urban poor, in order to ensure that this meets the needs of the intended beneficiaries both for cost and for location in relation to social networks and economic opportunities.

- **Supports cross-boundary and cross-sectoral cooperation.** While many aspects of governance are defined by territorial allocation, housing needs often cross administrative boundaries. Similarly, resilient housing is not solely a function of the physical construction of buildings, but is shaped by the location of settlements and the quality of basic services and infrastructure. These elements are often managed by different ministries and/or departments – hence cross-sectoral cooperation is critical.
- **Strengthens local governments.** Even if they are not directly involved in providing housing, the actions of local governments are often significant in the allocation of land and the provision of basic services for low-income housing. The capacity and mandates of local governments varies greatly between countries, but strengthening their ability to coordinate overlapping institutional mandates, manage inter-jurisdictional issues, and work effectively with communities are of particular importance in building resilience for the urban poor.
- **Involves CSO and grassroots organisations.** As seen above, civil society groups can play a significant role in planning and providing basic services for low-income neighborhoods, and supporting the urban poor in constructing houses. Their involvement in partnership with government agencies can extend the reach, affordability, and effectiveness of resilient housing programs and help institutionalize or mainstream participatory processes in the implementation of government housing programs.

## 2. Data

38. **Appropriate and reliable data on disaster risk, climate change and the multiple dimensions of urban poverty is an essential enabling factor for building resilient housing for the urban poor – particularly to ensure that households, communities and local governments are aware of the impacts of climate change on housing and are prepared to act accordingly.** Particularly important for housing is an analysis of the present and future distribution of vulnerabilities, hazards and exposure, across a range of scales (from households, communities, and settlements to cities and urban regions).<sup>26</sup> Both technology and community-generated information have a significant role to play – with analysis that brings these together being particularly important. Data that supports resilient housing for the urban poor needs to have the following characteristics:

- **Co-produced with urban poor communities.** Residents of low-income neighbourhoods have a rich store of information about their needs and available resources, and wide experience of hazards and strategies to respond to them. They are often involved in constructing houses, and have the greatest knowledge about their housing needs.

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<sup>26</sup> An example is analysis of disaster and climate risk information that can be used in designing housing investments for a country like the Philippines, see ADB. 2022. *Regional: Advancing Inclusive and Resilient Urban Development Targeted at the Urban Poor, Building Resilience of the Urban Poor: Incorporating Climate and Disaster Risk Information into Pro-Poor Housing Investments*. Consultant's report. Manila (Project Number 51325-001).



- **Combines different sources.** Locally generated evidence needs to be combined with scientific data to assess not only present, but also future, climate impacts. This will ensure that housing programs are fit for purpose in coming decades, as well as at the present time.
- **Accessible and clearly communicated.** For it to be useable for planning purposes – including planning housing and settlements – data needs to be georeferenced, available at the correct scale, and to the right actors.

### 3. Finance

39. **More resilient housing for the urban poor requires the commitment of resources that contribute to this goal.** Housing finance needs to be made available in ways that support more resilient housing for the urban poor; climate finance also needs to be leveraged to this end. Effectively supporting the housing and resilience needs of the urban poor will require financing from a range of sources, delivered by a range of institutions, using a range of instruments and complimentary approaches, based on good evidence, and monitored and delivered at appropriate volume and appropriate subsidiarity and scale. Financing for urban resilience needs to be identified, stimulated, secured and sustained for impact, both in individual interventions and also across an ecosystem of urban resilience financing. The private sector may have a role in developing and managing these instruments.

40. **Microfinance for building resilience may offer opportunities in this space.** Housing microfinance has grown steadily across Asia, with NGOs often serving as the leading microfinance institutions. Access to this type of financing can better help the poor in strengthening their housing and can also help government prevent the seemingly vicious cycle of relief assistance for damaged houses after every disaster. However, it will be important to undertake detailed analysis to identify whether housing microfinance institutions, both banks and nonbanks, are able to cater to the particular needs of the urban poor and the particular requirements of making housing disaster and climate resilient. However, while microfinance may be effective for short term loans to improve structures and make them more resilient, it will not meet the longer-term requirements of borrowing to support the acquisition of land and housing.

## F. Priority Investments

41. The analysis presented points to several possible priority investments that can both ensure that the houses of the urban poor are more resilient to climate change, and – by extension – can build the resilience of the urban poor themselves. These fall into three broad categories: safe land for housing; the capacity to construct; and the quality of buildings.

### 1. Safe land for housing

42. **Resilient housing for the urban poor requires access to safe land: either for construction of housing projects, or to enable the urban poor to construct their own homes.** This land will need to meet key criteria around safety (i.e., not being exposed to current or future climate-related hazards), accessibility (i.e., enabling the poor to gain access to urban services and livelihoods), and affordability. Investment in land is therefore critical for this. This might involve the purchase of land and its re-sale at affordable costs to the urban poor, potentially mediated through collective titles which can make this more affordable. It could also include land leasing and usufruct which are often more politically acceptable and reduce the risk of the land subsequently being sold for profit.

43. **Resilient housing also requires appropriate provision of basic services.** For new developments, this provision can be put in place before housing construction begins; for existing developments it may require retrofitting. Ensuring resilience to climate change requires additional investment in this infrastructure. First, the infrastructure needs to be designed to reduce risk in the context of climate change (e.g., through taking into account rising sea-levels or changing rainfall patterns). Second, the infrastructure itself needs to be resilient to climate change if these investments are not to be wasted. The urban poor can play a central role in designing and constructing community-level infrastructure that contributes to resilience, although this needs to be supported by city-scale infrastructure.

## 2. The capacity to deliver housing

44. **A range of actors participate in delivering housing, and the capacity of these different groups can be strengthened to enable them to do this in more resilient ways.** Professional capacities of planners and local governments are important in this area, to ensure that urban plans, development orders, and building regulations are appropriate for current and future climate shocks and stresses. Community architects have often played a significant role in designing affordable housing for the urban poor, and need to be better informed as to how these structures can be made more resilient while remaining low-cost. Finally, given that many of the houses of the urban poor are self-built or constructed by artisanal builders, these groups also need to be better informed about the implications of climate change for design and construction. Programs could be developed to strengthen the capacity of all these groups in the delivery of resilient housing for the urban poor.

## 3. The quality of buildings

45. **Where low-income groups have secure tenure, they can be supported to incrementally improve the quality of their dwellings to make these more resilient to climate change, and to better protect themselves from climate shocks and stresses.** This might include the provision of funds that can be drawn on by the poor for incremental construction, delivered through mechanisms that ensure that this is done in ways that strengthen resilience. These could either be grants or subsidised loans. It might also include the provision of subsidies and incentives to encourage the use of more resilient building methods and materials.