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Advancing Inclusive and Resilient Urban Development Targeted at the Urban Poor Pro-poor Climate Change Adaptation for Urban Areas

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For Asian Development Bank

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Abbreviations

CBO	community-based organization
COC	Centre Western Zone
CODEVI	Housing and Social Development Corporation of Medellín
CODI	Community Organisation Development Institute
COR	Centre Oriental Zone
IIED	International Institute for Environment and Development
INURBE	National Institute for Social Housing and Urban Reform
IPCC	Intergovernmental Panel on Climate Change
NGO	non-governmental organizations
NOC	North Occidental Zone
PRIMED	Programa Integral de Mejoramiento de Barrios Subnormales (Comprehensive Subnormal Neighborhood Improvement Program)
TDRI	Thailand Development Research Institute
UN DESA	United Nations Department of Economic and Social Affairs
UN HABITAT	United Nations Human Settlement Programme
UNESCO	The United Nations Educational, Scientific and Cultural Organization

I. INTRODUCTION

1. Climate change is expected to increase the intensity and frequency of existing hazards. But people will not all face this challenge in the same way, as the impacts of climate change are unevenly distributed; people that are marginalized in society are especially vulnerable to climate change because of intersecting social processes that create multidimensional inequalities (IPCC, 2014). Low-income people are already affected disproportionately, many of the projected impacts of climate change will reinforce and perpetuate poverty, increasing vulnerability and exacerbating inequalities. Hallegatte and Rozenberg's (2017) recent study estimates that up to 122 million additional people could be in extreme poverty in 2030 due to climate change. Unmitigated warming could reshape the global economy by reducing average global incomes and widening global income inequality (Burke et al., 2015b). The most severe impacts are likely to occur in urban areas and some rural regions in sub-Saharan Africa and Southeast Asia (Hoegh-Guldberg et al., 2018).

2. Globally, more people live in urban areas than rural areas. 54% of the world's population lived in urban areas in 2014, by 2050 this is expected to increase to 66% (UN DESA, 2014). Most of the growth in the world's population up to 2050 will be in urban areas in what are currently low- and middle-income countries, with 90% expected in Asia and sub-Saharan Africa (Revi et al., 2014; UN DESA 2014). Much of the key and emerging global climate risks are concentrated in urban areas (Revi et al., 2014). Given the rising levels of urbanization, an increasing proportion of the world's population will be vulnerable to the impacts of climate change in urban areas (de Sherbinion et al., 2007).

3. Low-income people are most at risk to climate change because they have fewer resources, cannot afford housing in areas less vulnerable to climate risks, and there is a lack of government investment to protect at risk areas. About one in seven people in the world live in poor quality, overcrowded and insecure housing, often in low-lying areas, and mostly in informal settlements with irregular land tenure lacking adequate drainage and basic infrastructure and services (McGranahan et al., 2007; Moser and Stein, 2011; UN-Habitat, 2011). Much of the climate risk in urban areas is concentrated in these settlements (Revi et al., 2014).

4. Failure to invest in urban climate adaptation will have significant adverse impacts on the urban poor (World Bank, 2015). Therefore, through secondary research this paper examines how urban informal settlement related initiatives can best support adaptation that effectively addresses vulnerability to climate change. The paper begins by conceptualizing the correlation between adaptation and vulnerability to climate change; specifically, it presents a continuum of response strategies, and the implications this has for vulnerability at its various stages. It goes on to examine priorities and focus areas for building more integrated responses in urban areas, with a particular focus on the key guiding principles for planning and implementing pro-poor informal settlement upgrading. It concludes with a reflection on the implications of upgrading programs for climate change adaptation.

II. FRAMING THE ISSUE: ADAPTATION AND VULNERABILITY

5. Adaptation to climate change typically involves long-term changes in behavior and practices aimed at reducing vulnerability to future climate change (Pelling, 2011). It is ideally a dynamic process with multiple (overlapping) responses to a range of climate and non-climate

shocks on various temporal and spatial scales. It typically includes reactive, concurrent or anticipatory changes (Pelling, 2011; Smit et al., 2000). Coping with climate change ensures immediate, short-term survival in a crisis; it does not affect underlying vulnerability (Antwi-Agyei et al., 2018; Berman et al., 2015). Coping can actually undermine adaptation (Eriksen et al., 2005).¹ For example coping may intensify vulnerability to future climate change by prioritizing short-term resource availability (Antwi-Agyei et al., 2018; O'Brien et al., 2007; Vincent et al., 2013). The objective of adaptation is in part to reduce the need for coping (Eriksen et al., 2005). However, determining whether an action is an example of coping or adaptation is context and scale dependent (Vincent et al., 2013).

6. Coping and adaptive strategies can co-occur despite being distinct, and coping strategies may develop into adaptive strategies over time (Berkes and Jolly, 2001). The factors that shape the capacity to cope may complement the factors that influence the ability to adapt over longer timescales. Indeed, the same context, assets, and exposure to shocks shape both coping and adapting (Adger et al., 2004; Smit and Wandel, 2006). Asset portfolios of individuals, households and communities are critical for both processes (Jordan, 2012; Chambers and Conway, 1992; Moser and Satterthwaite, 2008).² Those with access to diverse assets tend to have greater choice and flexibility in the strategies they adopt to respond to climate change (Jordan, 2019). Those with eroded assets have access to weaker strategies and fewer choices as to those they employ (Jordan, 2012). Furthermore, the intensity, scale, location, timing, duration, and frequency, by which different types of climate shocks occur can erode the very assets needed for both future coping and adaptation (Rahman et al., 2018).

7. Adaptation to climate change is largely happening incrementally worldwide (see Figure 1) (Fedele et al., 2019; Lesnikowski et al., 2013; Mapfumo et al., 2017; Wise et al., 2014). Incremental adaptation are interventions that do not significantly change existing political, social or household structures and norms and is therefore often referred to as the business-as-usual approach (Eriksen et al., 2015; Kates et al., 2012; Park et al., 2012). It addresses immediate and anticipated shocks through minor and small-scale adjustments to existing practices to make them better suited to dealing with climate change (Kates et al., 2012; Fedele et al., 2019; Mustak, 2018; Park et al., 2012). Unlike coping, incremental adaptation reduces vulnerability (proximate causes) in the case of re-exposure to the same climate shock. It might involve rebuilding a house that was damaged in a flood to new specifications, which make it more resilient to flood risk, for example, raising the plinth of the homestead (Fedele et al., 2019). In contrast, a coping strategy might involve a household migrating to earn funds to rebuild their house to the same specifications (Vincent et al., 2013). This ensures their immediate survival but makes them no more resilient to a flood of similar or greater magnitude (Antwi-Agyei et al., 2018; Vincent et al., 2013).

8. While there is little agreement on what qualifies as effective adaptation in practice (Owen, 2020), it is unlikely that incremental change on its own will be enough to avoid intolerable risks and indeed it may lead to costly maladaptation; there is a need for adaptation that will address how vulnerability is produced (Eriksen et al., 2015; Fazey et al., 2018; Fedele et al., 2019; Tschakert et al., 2013; Vermeulen et al., 2018). However, sequences of incremental adjustments (if they are additive) may set in place pathways towards transformation (Jordan, 2012; Rickards

¹ Agrawal (2010) argues that when climate shocks are repeated, the distinction between coping and 'real' adaptation breaks down.

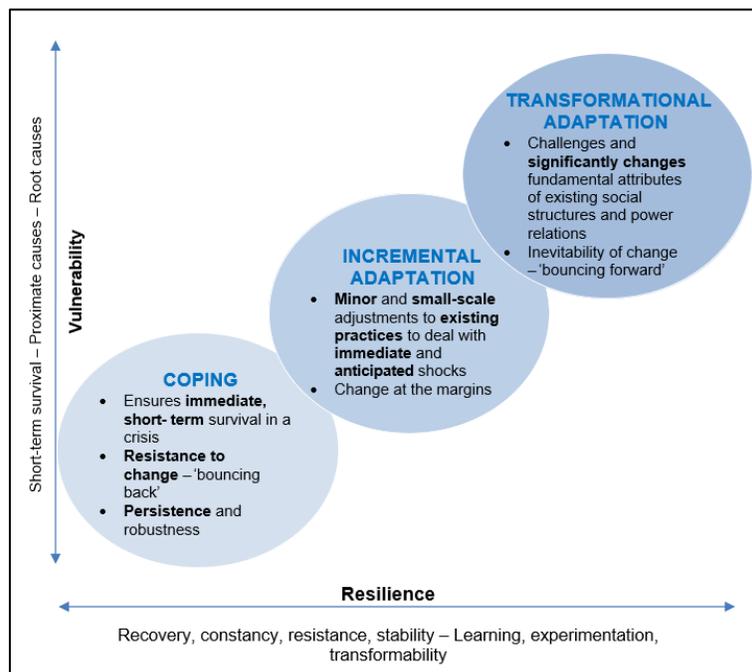
² The term asset portfolio is used to refer to the stocks of natural (land, water, trees, fish stocks), physical (equipment, infrastructure and other productive resources), economic (savings and access to credit), human (education, skills and health) and social (reciprocity, social ties between individuals and associations) resources that the poor draw on to reduce risk and to cope with, and adapt to, climate shocks (Moser and Satterthwaite, 2008; Speranza et al., 2014).

and Howden, 2012; Patterson et al., 2017; Pelling, 2011). On the other hand, additive incremental actions can lock systems into sub-optimal trajectories and delay transformation, potentially increasing risk (Matyas and Pelling, 2015; Vermeulen et al., 2018).

9.

10. Transformational adaptation is necessary to address the root causes of vulnerability to climate change (e.g., social, cultural, and economic relationships, and power hierarchies) through challenging and significantly changing the fundamental attributes of existing social structures and power relations (Blythe et al., 2018; Brown, 2016; Gillard et al., 2016; Handmer and Dovers, 2009; O'Brien et al., 2014; Pelling et al., 2015). Transformational adaptation occurs at the long-term end of the adaptation spectrum, cementing systematic and behavioral changes requires longer timeframes compared to the implementation of incremental adaptation or coping (Few et al., 2017).³ Responses to climate change that fall short of transformational change can be valuable and indeed poorly planned transformational change may maintain or reinforce vulnerability (Nalau and Handmer, 2015; O'Brien, 2012). There are many more barriers to implementing transformational adaptation than actions associated with incremental adaptation or coping (Chung Tiam Fook, 2017; Pelling, 2011). Such barriers include a lack of familiarity of what it entails, there may be limited political and social support due to high investments that may be needed, concerns about instability that may accompany significant social change, and longer timeframes required for potential benefits to be realized (Blythe et al., 2018; Fedele et al., 2019; Kuntz and Gomes, 2012).

Figure 1. A continuum of response strategies to climate change



³ See Feola (2015) and Patterson et al. (2017) for in-depth reviews on the distinction between transformational adaptation, incremental adaptation and coping.

11. While the outward objective of adaptation is to reduce vulnerability, the assumption that attempts to do so are always successful ignores the complexity of the relationship between different types of adaptation—incremental and transformational—and their diverse effects on addressing proximate and roots causes of vulnerability. Vulnerability is a differentiating process (Hilhorst and Bankoff, 2014), its uneven distribution arises from non-climatic factors and from intersecting socio-political processes that create multidimensional inequalities (IPCC, 2014). Multiple forces and processes cause vulnerability itself (Kelman et al., 2015; Bankoff, 2003; Wisner et al. 2004), these are often structural. Their underlying causes are largely shaped by economic, demographic, political, social and gendered processes (Thompson-Hall et al., 2016; Marino and Ribot, 2012; Wisner et al., 2004). Indeed, adaptation may not effectively reduce vulnerability if it only deals with proximate causes of vulnerability, without also addressing the fundamental root causes as to why people are vulnerable in the first place (Jordan, 2019; Bankoff, 2018; Rühlemann and Jordan, 2019).

12. Measures intended to adapt to climate change are not always successful (Juhola et al., 2016; Mikulewicz, 2020; Neset et al., 2019). Past research shows that due to multiple drivers and the spatial and temporal complexity of climate change problems and responses, people in different places and at different times may have differing perspectives on the success of a particular adaptation measure (Atteridge and Remling, 2017; Barnett and O’Neill, 2010; Magnan et al., 2016). Adaptation measures may simply fail to reduce vulnerability to climate change impacts without doing actual damage; they can also become maladaptation, ‘increasing vulnerability for the targeted and/or external actor(s), and/or eroding preconditions for sustainable development by indirectly increasing society’s vulnerability’ (Juhola et al., 2016, 139). Juhola et al. (2016) distinguishes between three types of maladaptive outcomes: those that increase current or future climate change vulnerability of target beneficiaries or implementing actors (rebounding vulnerability), those that transfer negative effects to someone not considered by the intervention (shifting vulnerability), or that lead to negative feedbacks on a global scale (eroding sustainable development) (see Antwi-Agyei et al., 2018; Rahman and Hickey, 2019).

III. BUILDING URBAN CLIMATE ADAPTATION – LESSONS FROM INFORMAL SETTLEMENT UPGRADING

13. Adaptation will require responses by individuals, households and communities, all levels of government, multilateral development banks, the private sector, and civil society. Satterthwaite et al. (2020) argues that the most effective and cheapest way to enhance the urban poor’s resilience to climate change is often to support them and their community organizations to work with local governments to implement upgrading programs. This section draws on in-depth case studies to suggest a range of priority areas on which such interventions could focus on to better support effective climate action in urban areas. These priority areas for action should not be interpreted as being mutually exclusive. Rather, the proposed intervention areas represent a progressive circuit (i.e., virtuous circuit), whereby each component reinforces each other to create more integrated strategies of urban adaptation and ultimately enables individuals, households and communities to move along the continuum (i.e. set in place pathways to developing transformation). Furthermore, this should not be interpreted as a one size fits-all approach to enhance adaptation, as effective responses to climate change are variable and linked to local contexts and places.

14. While informal settlement upgrading was not formed with the specific objective of providing strategies to respond to climate change, most of what upgrading provides also reduces climate related risks (Satterthwaite et al., 2020). This paper reviews the evidence of three slum-upgrading programs: Thailand's Baan Mankong program, a relocation initiative in Solo city in Indonesia and Medellín's Programa Integral de Mejoramiento de Barrios Subnormales (Integrated Program for Improvement of Slum Settlements) in Columbia. These programs were selected as they are regarded in the literature as examples of good practice in informal settlement upgrading and they cover different types of upgrading at different spatial scales and levels of outreach. Understanding how the upgrading programs were planned and implemented can provide insights on the different facets and approaches necessary to ensure that upgrading is successful (Taylor, 2015).

A. Baan Mankong nationwide slum upgrading program in Thailand: secure land options

15. Many federations work in partnership with government in upgrading throughout the world (e.g., Lines and Makau, 2017; Patel, 2013). The Community Organizations Development Institute (CODI), under the Ministry of Social Development and Human Security, introduced a secure tenure program in 2003, which has reached over 100,000 households in Thailand (about 15% of informal dwellers), through approximately 930 projects that have been implemented in 320 cities across 72 provinces with a budget of \$191 million (see Table 1) (Boonyabancha and Kerr, 2018; CODI, 2014). The program is a result of significant political support and a long history of community-driven mobilization. It began with the development of community savings activities throughout the country, then the establishment and bolstering of large-scale networks of low-income communities, the provision of housing loans to low-income communities in urban areas and using people's managerial skills to address housing problems at a city-wide scale (Boonyabancha, 2009). Informal communities and their community networks play a critical role in the programme, they are active participants in improving their own circumstances, through developing long-term, comprehensive solutions to problems of land, housing, living environment and basic services in line with the priorities they set, using budgets they manage and technical assistance they choose (see Box 1) (Boonyabancha, 2009).

16. Key to the Baan Mankong program is its focus on building strong alliances and partnerships between low-income communities and urban development partners to foster learning and mutual support. Low-income communities work closely with a diverse range of actors, including local government, non-governmental organizations (NGOs), academics and professionals, to survey all the informal settlements in their cities and then plan upgrading activities (Lucci et al., 2015).⁴ Once these plans are finalized and the upgrading activities are

⁴ Types of upgrading, include:

- On-site upgrading: a community's physical environment and basic services is upgraded, without changing the existing housing layout.
- On-site reblocking: a community's physical environment and infrastructure is improved, with some adjustments to the layout of some houses and paths, for example re-aligning lanes to allow installation of sewage pipes.
- On-site reconstruction: existing housing is demolished and the community is rebuilt, allowing low-lying areas to be in-filled before reconstruction. Reconstruction is also used following fire or other disasters.
- Land sharing: where a landowner needs to use the land, the community negotiates to lease or buy a portion of the land, while the landowner uses the other section of the plot.

approved by committees at the regional and national level, the CODI, channels flexible finance through infrastructure subsidies, housing and land loans direct to the communities to manage the budget themselves (Boonyabanacha, 2009).

Box 1. A community-driven and demand-driven approach towards land for housing the poor

First, how to get land. The strategy adopted in the program turns over the task of identifying and acquiring land for housing to communities and their city-wide networks. The accessible and flexible finance that the program offers enables poor people in communities around the country to search for, negotiate for and acquire public or private land under a variety of purchase and leasehold arrangements, often in collaboration with their local authorities. Because communities themselves are exploring different kinds of land options in their cities – in their own ways and according to their own requirements and conditions – the upgrading program is yielding a variety of unconventional secure land options for the poor.

Second, how to keep the land. In many slum regularization schemes, public housing projects and even in past people's housing projects, as soon as land has been secured and the housing project is finished, poor people start selling up and moving out. Communities end up fragmenting because land prices in the project increase tremendously and poor communities – even newly secured ones – are selling and accepting offers from market buyers. In the Baan Mankong program, the strategy of collective land tenure (land must remain collective during the 15-year period when communities are repaying the land and/or housing loans) has been adopted to ensure that poor people keep the land, secure their housing and sustain themselves as a community. Collective land tenure helps protect people during the vulnerable transition period from being informal dwellers to being formal land and housing owners.

Third, how to build a new strong community and social support system on that land. The poor do not stop being poor the instant they get secure land and housing. The Baan Mankong program is also searching for ways whereby the relationships that land creates and the conditions through which land is found and held build new social systems in poor communities, to link people together and to spark off a variety of collective development activities (individual community level to the level of the district-wide network of communities) for addressing other needs and aspects of their lives in a more integrated way. The implication of continued collective action is that community members are satisfied with the product of the participatory process, and are willing to take it further for the benefit of their communities. So the housing project is not an end in itself but, rather, the beginning of more community development, in which a group of poor people can live together and can continue to address the real issues of their poverty as a matter of course.

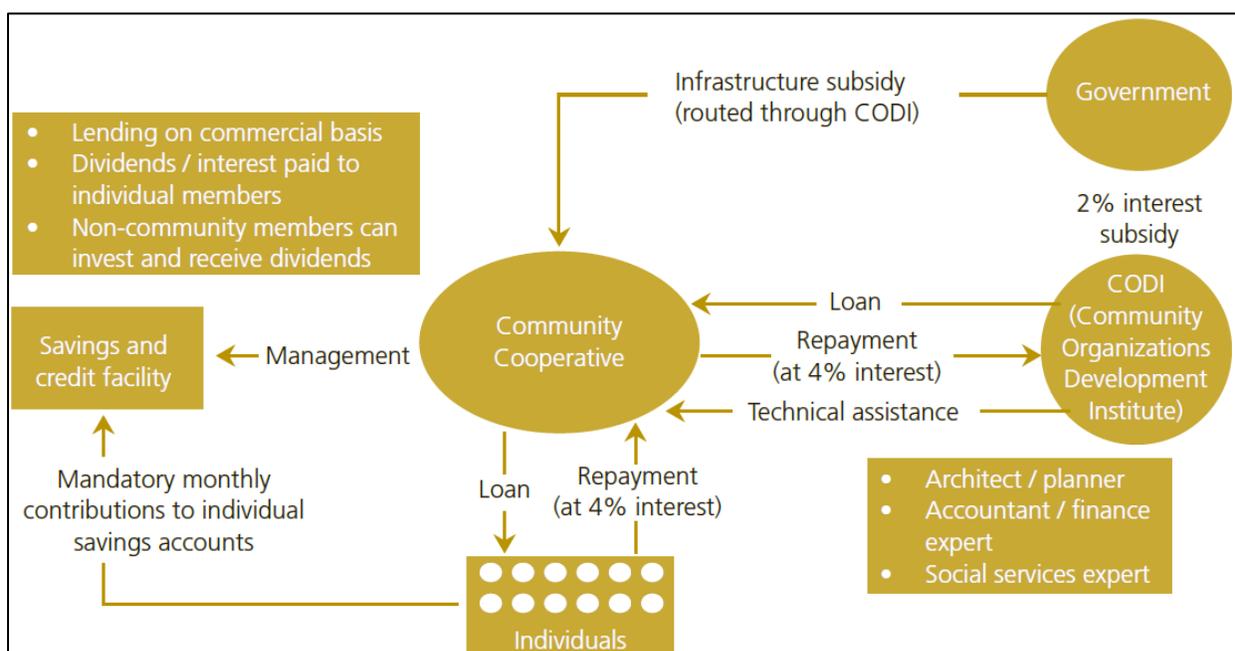
Source: Archer (2012: 183); Boonyabanacha (2009: 310-311; 322; 323)

17. To be eligible to join the upgrading program, communities are required to form savings and credit groups and register themselves as cooperatives, in order to establish a collective legal entity that can take housing loans, receive other development subsidies and buy or lease land collectively (Boonyabanacha, 2009). CODI has extended housing loans that have amounted to \$191 million over an 11-year period for housing improvements (CODI, 2014). The program

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- Relocation: if tenure cannot be secured on the existing site, a community can find a relocation site with secure tenure. Nearby relocation is within 5 kilometres of the original site (Archer, 2009).

subsidizes the interest rates of these loans, they are extended to community cooperatives at 2% annual interest rate (non-subsidized CODI housing loan rate is 4% annual interest rate) and allocates a grant to each community of around \$610 per family (see Figure 2) (Boonyabancha, 2009; Lucci et al., 2015). Cooperatives then lend on to members, usually adding a 2-3% margin on the interest to create a fund to cover arrears and default and to fund other community activities, expenses and some welfare program (Boonyabancha, 2009). CODI's finance provides a guarantee for landowners who may be cautious about renting land to slum dwellers on a long-term basis. Access to utilities and basic infrastructure (e.g. water sewers, drains, paved roads) is provided by the municipality or utility company through agreement on particular community developments. In addition, Baan Mankong provides subsidies for some infrastructure (e.g. for onsite upgrading) (Lucci et al., 2015).

Figure 2. The Baan Mankong financing model for informal settlement upgrading



Source: UN-HABITAT (2009: 18)

18. CODI's flexibility has helped enable the implementation of the program. It can apply directly to the government budget and channel money quickly and directly to community networks, instead of it trickling through ministries (Bhatkal and Lucci, 2015). CODI has flexibility in its operations and a decentralized system of regional offices that have considerable autonomy. Importantly, this has enabled the program to address the needs of specific communities through flexible tailored solutions (Bhatkal and Lucci, 2015).

Table 1. Summary of progress made

Tenure security	<ul style="list-style-type: none"> • Tenure security provided to over 96,000 households between 2004 and 2014. • Fear of eviction dropped as a concern for slum dwellers from second to fifth place from 1990 to 2006.
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	<ul style="list-style-type: none"> • Slum communities are now recognized as legitimate citizens.
Housing and living conditions	<ul style="list-style-type: none"> • 84% of the urban population lived in dwellings made of cement, brick or a combination of wood, cement and brick in 2010 compared to 66% in 2000. • Distributed materials and also makes money available for improvements such as levelling floors to prevent flooding, replacing rusted corrugated iron roofing sheets, and reconstructing houses. • Identifies vulnerable groups (e.g., the disabled) and builds rooms or community homes for them (known as Baan Klang or central houses) • Often have rooms that can be rented, allowing those who cannot upgrade to remain in the community. • Leverages resources to construct community spaces (e.g., community libraries and nurseries).
Water, sanitation and electricity	<ul style="list-style-type: none"> • Constructed drainage systems, communal septic tanks for sanitation, household connections for water supply and electricity, and grey-water treatment units. • Greater legal access to water, sanitation and electricity and reduction in cost. 16 communities reported a 10% reduction in monthly expenditure on water and a 5% reduction on electricity.
Education, employment and access to credit	<ul style="list-style-type: none"> • Tenure security has helped some gain formal employment as many employers require a formal address. • Greater access to credit and increased investment in and income from businesses • Children in households participating in the programme were found to spend an average of about 3.6 hours per week more on studying and doing homework than those that did not participate. • Education expenditure per child increased by 40% with resources available through community funds.

Source: Bhatkal and Lucci (2015); CODI (2014); National Housing Authority (1992); National Statistical Office (1990; 2000; 2006; 2010); TDRI (2014); UN Habitat (2006)

19. While Bang Mankong's core focus is not on climate change adaptation, there is evidence that Bang Mankong can facilitate incremental adaptation, the most evident example is through making improvements to existing dwellings (e.g. levelling floors to prevent flooding) or building houses to new specifications (e.g. using more durable building materials) (see Table 1), making them more resilient to a flood of similar (and possibly greater) magnitude. Archer (2012) argues in her study of four Bangkok communities that had recently completed the upgrading process, that residents no longer fear flooding during the rainy season. UN-HABITAT (2014) found that Wat Kao and six surrounding communities had the necessary assets to prepare for, withstand, and recover from major flooding in 2011. Over the years, they had accumulated collective savings for an unforeseen situation such as this, and also had close links with the local government, and support from CODI and its network of informal dwellers. Relief teams were organized, sandbags were on standby, a community disaster center with a kitchen had been established, boat patrols

to check on houses and people were organized, and communication systems with the local government and hospital were in place. After the floods, the community cleaned up or constructed new housing (with support from Baan Mankong program) on stilts in line with the new bylaw requiring electricity plugs and water connections to be above the flood line. Not only did the community ensure fair distribution of supplies and compensation, but it also supported the rebuilding of livelihoods for those whose earnings had been disrupted by the floods.

20. However, Archer (2012) found in her study of four communities that recently completed the upgrading process, that the housing loan (limited to US\$5000-\$6666) was only enough for a basic structure of walls and a roof. Therefore, households that did not have access to other sources of finance had to live in an incomplete house (Archer, 2012). Yap and Wandeler (2010) raise questions on the sustainability of Baan Mankong's financing model for upgrading given that the loan capital remains tied up in real estate for the 15 years of the housing loan repayment, which may lead to cash flow problems for CODI. Furthermore, while making improvements to existing dwellings or building houses to new specifications increases resilience to climate change, it is unclear whether they are located in hazardous areas. Were climate change projections utilized to help identify and select the land that the houses were built on? To the best of my knowledge, there is no literature that indicates whether communities relocated or rebuilt in areas that are vulnerable to current and/or future climate change. Utilizing projections as part of assessments of community vulnerabilities and risks is clearly a key entry point for better integrating climate change into Bang Mankong, as well as the relocation initiative in Solo city and PRIMED. Climate change projections can help improve the design tolerance of systems and structures, for example, a municipality may, based on projected changes in the intensity of future rainfall events, change the design criteria for the diameter of storm-water pipes to accommodate greater flows.

21. While Baan Mankong provides shelters for the homeless, disabled and the most vulnerable and often has rooms that can be rented to those who were not eligible for a full housing right (see Table 1), it likely excludes those with lower repayment capacity and fund management skills as setting up a community saving group (through which members should save a 10% deposit of the total government loan to be taken out) is a precondition to join the program. This highlights the need to tailor housing solutions for different groups of poor people, particularly taking into consideration the needs of the most vulnerable (Bhatkal and Lucci, 2015). Furthermore, there is potential to strengthen livelihoods by taking advantage of social capital build up within the communities to set up various skills groups. For example, Bang Bua had a group making a liquid solution of micro-organisms that is poured down drains, improving canal water quality (Archer, 2009). As the upgrading process has increased the debt burden of beneficiaries, the outcome is that they have less interest in groups, unless they provide skills and jobs that ensure an additional source of income for residents (Archer, 2009). Though, occupational skills contribute to improved standards of living, thereby enabling people to better respond to climate change, it is critical that this involves diversifying into economic activities that are less sensitive to climate change.

B. Relocation of riverbank communities through a participatory process: financial support to find and build houses in safer locations in Solo city, Indonesia

22. Solo (formally known as Surakarta) is a secondary city with a population of around 600,000 inhabitants in Central Java Province in Indonesia. The southern part of the city floods regularly due to its location on the banks of the Bengawan River. The riverbank area is classified as a

disaster-prone area, with seasonal rains threatening residents who have little means to build their homes with robust materials and who have occupied this public land because their resources are too limited to buy land on higher ground (Taylor, 2013). In 2007, 6,368 households were affected by large-scale flooding, 1,571 lived along riverbanks and, of these, 1,012 did not have land title (Government of Surakarta, 2012, cited in Taylor, 2013). Given the high cost of providing emergency services and the more than US\$100,000 in damages caused by the flooding, Solo's mayor, Joko Widodo, decided to relocate residents living in areas of high risk (Taylor, 2013).

23. The relocation of flood-prone riverbank communities between 2008 and 2012 has largely been considered a success with 70% of the families considered at greatest risk having moved to safer locations and those that have moved generally feel satisfied with their new locations and living circumstances (Obermayr and Sandholz, 2017; Taylor, 2015). Without local decision power and participation of community members, resettlement can lead to landlessness, homelessness, unemployment, social marginalization, food insecurity, and reduced access to common-property resources (Barnett and O'Neill, 2012). Relocation was a complicated program for Mayor Joko and the Solo government to implement because residents were reluctant to move away from often strategic locations to areas located further away from their jobs, particularly if they had titles to the land (Taylor, 2015). The Indonesian government initially agreed to provide a limited amount to support the resettlement program, but it was inadequate. It was challenging for the Mayor to convince the Solo government to provide the required funds to relocate riverbank dwellers that were migrants from outside Solo city (Taylor, 2015). A comprehensive policy was developed to provide informal riverbank dwellers and migrants, into the city's social welfare programs (e.g., education, healthcare for the poorest, and trainings for small-scale entrepreneurs), and to extend these city services to them by expediting the process for them to become officially recognized (see Box 2) (Taylor, 2015).

Box 2. Relocation through a participatory process centered on local needs and priorities

Mayor Joko and other officials engaged in a process of extensive outreach to build social trust and listen to the concerns of riverbank residents. They met in neighborhood community centers over the course of 24 separate meetings. Through such extensive outreach the mayor listened to locals and also set up a multi-tiered community engagement approach (at the city, neighborhood and sub-neighborhood levels), forming working groups. These working groups consisted of community representatives who collected and disseminated information, verified community data, looked for alternative lots of land and presented their opinions to government. This effort strengthened local institutional networks.

The government's strategy was to convince households that it was worth trading their riverbank locations for legal land tenure, extension of city services (where needed expediting the process of obtaining official identity cards to access basic services), the chance to live in safety, and a new 'urban forest' providing a public green space amenity to citizens. Critically, the new urban forest reduced vulnerability to flooding for those families that decided to continue living on the exposed riverbanks (Taylor, 2013). Eventually, a standardized compensation measure was agreed upon through which households that owned houses in the riverbank areas would be given cash grants to buy new land of at least 50 square meters (equivalent to US\$1,200), build new houses (US\$800) and contribute to building public infrastructure (US\$150) (Government of Surakarta, 2012). In total, 1,571 homeowners were offered the compensation, 993 of whom did not have legal land tenure. Only approximately 40% of the cost was covered by national government transfer to assist the communities affected by flooding. The mayor had to convince local parliament of the importance of releasing the remainder from the city's funds.

The compensation scheme encouraged riverbank community members to take the cash grant and use it to find their own plots of land and negotiate the cost. They were encouraged to create their own working groups of neighbors and to strategize for the move together, which would allow them to maintain a sense of continuity and social stability by preserving their networks. Perhaps the most significant offer made by the city government was the guarantee to expedite land tenure for these new plots. Usually a lengthy and costly process, undertaken through the National Land Agency, the local government ensured that it would cover the costs involved and prioritize their claims. But buying land and moving to sites within Solo was not the only option available to the riverbank residents. The cash grant offer also meant they could move outside of Solo to other municipalities, or even to public housing available in the city.

The Solo government followed up the relocation with complementary investments to ensure the relocation site was integrated into the city. Most of the people who moved found lots of land within the city boundaries in the northern area of Mojosongo. At this time, Mojosongo was sparsely populated with few roads or services, which helped to lower the costs of land. The city government agreed to continue to support the resettled population by extending electricity, water supply, sewer pipes and roads at no additional cost to ensure that their new residence would be a part of the city. It was the working groups that had to be proactive about connecting with government and ensuring that these further services were extended.

Source: Bunnell et al. (2013: 865); Taylor (2015: 627-629; 2013: 5)

24. Many relocation initiatives fail due to limited (or no) local decision power on the migration process and the destination (Barnett and O'Neill, 2012), as well as insufficient benefits (Arnall, 2014), which may be likely to disrupt local relationships and structures (Binder and Baker, 2017). However, the government, in this case, was able to successfully negotiate with riverbank dwellers by recognizing and addressing their priorities. Such complementary interventions outlined in Box 2 demonstrate that the process of reducing vulnerability cannot consist only of upgrading, but that people are motivated by and respond positively to having their basic needs met (Taylor, 2015). The case study finds evidence that the relocation initiative supports incremental adaptation, the most evident example of which is the resettlement of the majority of families considered at greatest risk to safer locations. They now have adequate and more durable houses than their previous dwellings constructed along the riverbank area in the disaster zone (Bunnell et al., 2013; Obermayr and Sandholz, 2017). Critically, resettlers now have access to free education, occupational skills training (e.g. training for small-scale entrepreneurs) and healthcare, thus standards of living have improved, enabling them to better respond to climate change. Moreover, people in good health will be less vulnerable to the immediate and secondary impacts of extreme events. Obermayr and Sandholz (2017) argue that social ties were not only maintained, but largely improved due to the relocation program, this is a key entry point for intervention as these networks can be a valuable resource in building and maintaining resilience, through mechanisms, such as risk sharing, mutual assistance and collective action.

25. Though, the relocation program has been considered a success, as nearly 1,000 houses have been relocated and families that have moved generally feel satisfied with their new locations and living situation (Obermayr and Sandholz, 2017; Taylor, 2015), it is significant that 578 households with legal tenure of their riverbank plots did not move as they felt that the compensation being offered was inadequate. Many of these 578 legal dwellers are still located in the same riverbank areas to this day (Taylor, 2015). Similarly, riverbank dwellers that did not own their houses, but instead rented them, received disaster aid, but were ineligible for compensation

(Taylor, 2015). With no compensation, such households have little option but to remain in situ. Nevertheless, there are numerous examples of strategies that facilitate incremental adaptation for those that remained behind. The new urban forest along the banks of Bengawan River (see Box 2) reduced vulnerability to flooding for those families that decided to continue living on the exposed riverbanks (Taylor, 2013). The construction work in the area included the fortification and heightening of the dam, the implementation of an early warning system, and the establishment of a water-pumping system increasing the drainage capabilities of the surrounding districts (Obermayr and Sandholz, 2017). Accompanied by disaster mitigation training programmes, the vulnerability of the community against flood events has reduced (Obermayr and Sandholz, 2017). Another positive outcome is an increased quality of public services (e.g. quality of freshwater provision, sewage and waste disposal) (Obermayr and Sandholz, 2017). However, these improvements cannot be directly linked to the relocation initiative, and the effects of other governmental program must be considered. Though, indirect effects can be derived and explained by the fact that a lower population density in the area means fewer loads for public service systems, resulting in better quality of services and in turn potentially better health conditions (Obermayr and Sandholz, 2017).

26. It is important to consider that the relocation initiative might have been possible in Solo city due its smaller size, the availability of undeveloped land, decentralized governance providing city governments with more flexibility to develop policies that respond to local concerns, and strong local political leadership (Bunnell et al., 2013; Taylor, 2013; 2015). Clearly, Mayor Joko's political leadership was an important factor in Solo's success, however, the belief that it was his unique leadership that is responsible for driving urban renewal can be disempowering in that progress may be viewed as dependent on a local champion emerging (Bunnell et al., 2013; Taylor, 2013). Bunnell et al. (2013, 871) argues that it is important to situate Mayor Joko's personal influence in the context of *'wider historical dynamics of social and governmental transformation in [the] city'*, indeed Solo had already taken important steps towards a participatory planning approach before the Mayor was elected (Widianingsih, 2005). Nevertheless, Taylor (2013) warns that we do not know if Mayor Joko's approach to local government leadership has been institutionalized, and whether there is a systematic legacy in Solo.

C. Medellín's Programa Integral de Mejoramiento de Barrios Subnormales (PRIMED): integrated slum upgrading programme in Columbia

27. Urbanization was not effectively managed and many migrants looking for job opportunities ended up living in informal settlements. From the 1980s, Medellín's population expanded due to displacement from rural areas caused by armed conflict. The situation was compounded with the growth of the Medellín drug cartel and an increase in paramilitary and guerrilla activity. This, together with declining industry and high unemployment contributed to safety concerns in the city, particularly in informal settlements (Betancur, 2007). In 1993, PRIMED was set up to respond to the challenges posed by the expansion of informal settlements in Medellín, 80% of new settlements over the previous 20 years had been informal (Imparato and Ruster, 2003; Lucci et al., 2015). At the time the total population of Medellín's informal settlements was 250,000, approximately 14% of the city's population (Imparato and Ruster, 2003; Betancur, 2007). Many of these settlements were high density, built on unregulated, most notably the steep slopes of the Aburrá Valley which is prone to mud slides, lacking proper street systems, public spaces and facilities (Betancur, 2007; Lucci et al., 2015).

28. PRIMED was part and parcel of the general effort to confront these urban realities at a cost of approximately US \$2,940 per household ((Betancur, 2007). It was a pilot program of cooperation between the city of Medellín and the governments of Colombia and Germany. The program centered on community building and participation and inter-institutional cooperation, including a coordinating committee with a number of relevant agencies. While PRIMED was administered under the Housing and Social Development Corporation of Medellín and was accountable to the Mayor, it operated through an independent structure (Betancur, 2007). As such, it maintained a reputation free of clientelism and 'attract[ed] an array of social forces (e.g. the Catholic Church, philanthropic entities, institutes and universities) that had been traditionally alienated by the politically charged and self-interested parties commonly involved in this type of work' (Betancur, 2007, 4-5). There was a clear division of activities, with PRIMED responsible for planning, coordination and administration, while government bodies, NGOs and subcontractors were in charge of the implementation of projects. (Lucci, et al., 2015).

29. The program was split into two phases:

- Phase 1: sought to move a set of informal settlements with some previous but limited public assistance (categorized as 'Level 2 according to the municipality') to settlements with a sustained level of government intervention that have come close to meeting basic standards (categorized as 'Level 1').
- Phase 2: was intended to target the most marginalized settlements, those with no previous government intervention (categorized as 'Level 3') and sought to bring them up to 'Level 2'.

30. Its main objectives were to: improve the built environment – adapting houses, infrastructure (e.g., access to water and sanitation and improvements in storm drainage), roads and public buildings (e.g. schools, health centers and leisure areas), and consolidation of slopes and earthworks; provide secure land tenure for informal settlements – individual land titling; strengthen planning, management and inter-institutional collaboration; promote civic participation and community development; and mitigate geological risks on the mountainsides – removal and resettlement of families (Betancur, 2007; Imparato and Ruster, 2003; Lucci, et al., 2015; Restrepo, 1996). PRIMED staff estimated that the program has benefited 51,000 people, 20% of the population in informal settlements in Medellín (see Table 2)⁵ (Betancur, 2007).

⁵ Table 2 is based mostly on the results of random survey of 300 households (two-thirds of respondents had received home improvements by PRIMED) carried out by PRIMED.

Table 2. Evidence of impact

<p>Establish mechanisms of administration, planning and implementation</p>	<p>PRIMED was able to establish a structure with the characteristics described under administrative structure and inter-agency cooperation.</p>
<p>Promote citizen participation</p>	<p>PRIMED's self-evaluation of the program found that it encouraged community participation: 84% of respondents reported that they had some level of participation in local government projects and 68% indicated that citizen participation had increased. Further, while 69% believed that the community had the ability to participate in project identification and design, 75% thought that it had the capacity to establish organizations for its own development. Residents also indicated that they had the ability to watch over and respect the established norms to see that public spaces were not invaded, and to take care of the infrastructure and public facilities. PRIMED's beneficiaries also claimed that relations among neighbors and perceptions of safety had improved.</p> <p>However, no independent evaluation is available to determine the accuracy of PRIMED's findings. Some scholars contend that citizen participation assumed a passive/client form; it took the forms of information; involvement of residents in implementation on a paid (subcontracts and employment projects) and unpaid basis (labor provision for specific projects); education on issues related to project maintenance and use; funding of small projects proposed by NGOs/CBOs (community-based organization); subcontracts with CBOs; and negotiations over relocation and conflicts. At the end, on the suggestion of the community, residents appointed a committee to represent them in the process of decision-making and planning. But, it is important to also highlight that local CBOs were reactivated and there was an increase in female leadership; emergence of new organizations and leaders; involvement of local Juntas (local action committees) in the formulation of various projects; establishment of a watchdog committee including citizens; inclusion of community representative in PRIMED's committees at multiple levels.</p>
<p>Neighbourhood Improvements</p>	<p>Significant improvements were made to the physical conditions of the neighborhoods. Increased the pedestrian infrastructure from a coverage of 40% to 60% (compared to the average of 90% for the rest of the city); brought the infrastructure of streets to 80% of the area (close to the 90% level of coverage for the rest of the city); established health centers in NOC (North Occidental Zone) and advanced plans for COR (Centre Oriental Zone); provided 2,800 meters in parks and open spaces; built secondary education establishments in each of the zones and a school in COC (Centre Western Zone); added 5,500 sq. m. of recreational space with an additional 20,800 projected for development; added 6,000 m. in water pipes sufficient to serve 95% of households; built 1,000 sq. m. for a communal facility and 7 communal restaurants; built 5,000</p>

	m. in sewers as part of a projected coverage of 90%. 91% of interviewees stated that they were now better linked to the city. 96% of respondents indicated that their quality of life had improved.
Home improvement and relocation	Improvements in over 3,500 dwellings; relocated an undisclosed number of dwellings; worked with INURBE (National Institute for Social Housing and Urban Reform), CODEVI (Housing and Social Development Corporation of Medellín) and other low-income housing organizations to increase the use of subsidies and loans for improvement of thousands more. 66% of respondents indicated high levels of satisfaction with achieved home improvements with program support.
Legalisation of tenure	Identification of issues and requirements for legalization under the different existing conditions of land tenure; establishment of process of legalization for those areas in which it was most feasible; legalization of more than 2,100 households or less than 5,180 targeted; establishment of a process that is guiding legalization in other areas of the city. Land titling proved more difficult than anticipated; a complex set of issues including existing legislation, land ownership; land condemnation; household ability and willingness to participate, among others.
Mitigation of geological risks	Recovery of 5 Ha. and stabilization of 8.5 Ha. or nearly 70% of areas classified as high risk; channeled 640 m. recovering the basins of streams in a high level of deterioration.

Source: Betancur (2007: 6); Lucci, et al. (2015: 16)

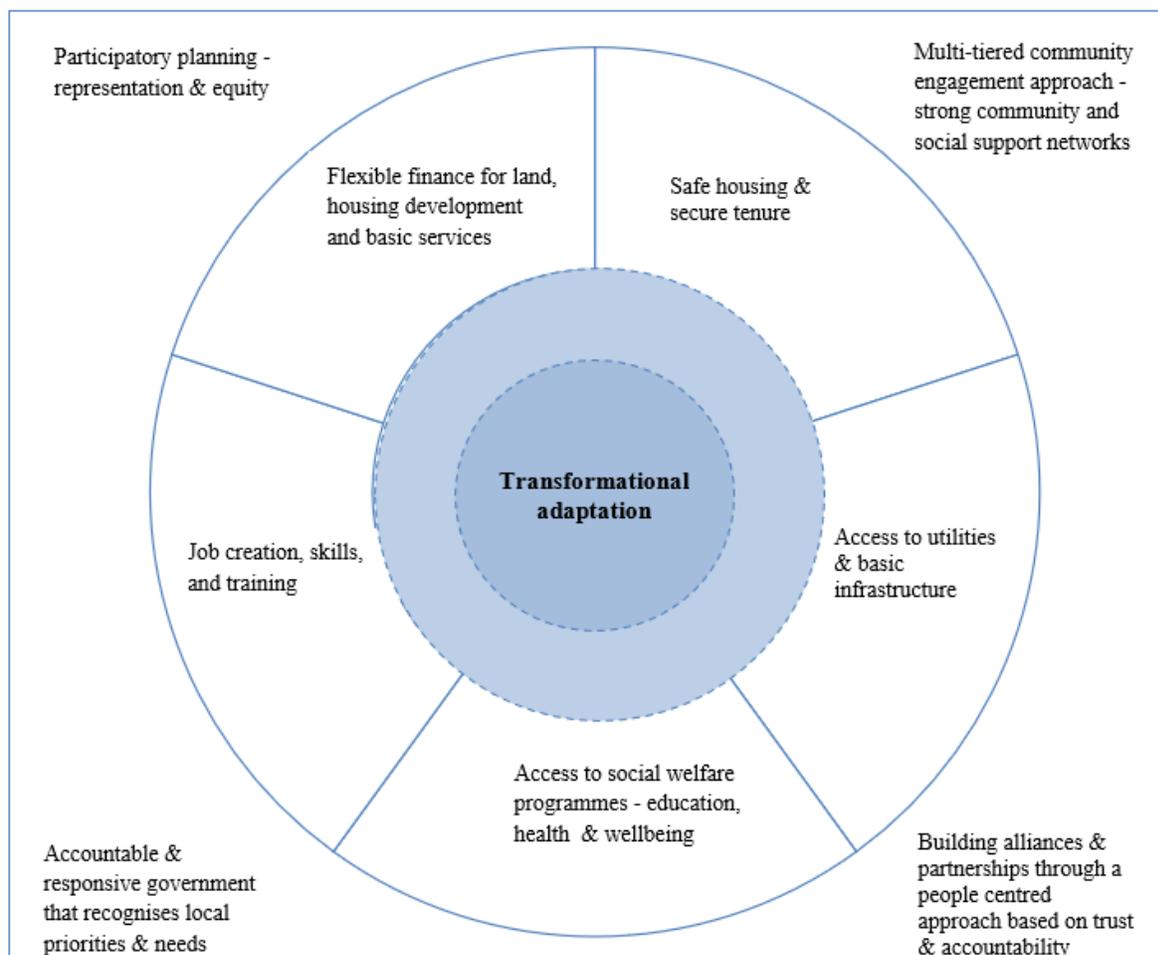
31. The case study finds evidence that PRIMED supports incremental adaptation (albeit lower levels than the Baan Mankong program and Solo city’s relocation initiative) through the removal and resettlement of families living on hazardous land prone to mudslides to safer locations, stabilization of nearly 70% of areas classified as high risk, and improvements in over 3,500 dwellings (see Table 2). Despite PRIMED successes, the number of households receiving formal tenure was significantly reduced by a complex and lengthy judicial process to issue land titles. In addition, PRIMED did not offer job training, employment opportunities with PRIMED were temporary, and skills acquired did not aid in securing full-time positions significantly reducing the program ability to enhance adaptation to climate change (Betancur, 2007). Though, PRIMED had a strong focus on community engagement, unlike the Baan Mankong program and Solo city’s relocation initiative, at-risk people’s participation in planning and decision-making was lacking in the initial stages of the program. Specifically, PRIMED highlights the importance of considering potential tensions or clashes in attitudes and behaviors among at-risk people and the inequities within local power structures, for example negotiations for projects to continue had to take place each time there was a change in the control of settlements by different armed groups (Betancur, 2007).

32. While these achievements are no small feat, PRIMED was terminated in 2000, before beginning its second phase because ‘traditional representative and technocratic planning mechanisms’ resisted and resented its innovative approach (Calderon, 2008: 61) and because the programme’s placement within the municipal bureaucracy ensured that only ‘limited electoral capital could be derived from [its] isolationist culture’ (Betancur, 2007, 11). PRIMED’s ultimate contribution was to inspire a radical shift in rules for a municipality that previously relied on ‘repressive measures against people illegally occupying any space’ (PRIMED, 1996: 30; cited in Bahl, 2012). Since PRIMED, other programs have been introduced in the city, which follow many of the same principles of participatory planning, coordination between different government agencies, and integration of the urban poor into the city (Lucci et al., 2015). Social urbanism has benefited greatly from the history of PRIMED (Bahl, 2012). Indeed, actors who participated in PRIMED have helped execute social urbanism programs, thereby allowing for ‘the Integrated Urban Projects model to build on a process that in spite of its shortcomings had already mobilized part of the community and created the beginnings of the mainstream of acting on slum areas’ (Calderon, 2008, 91). In particular, Integrated Urban Projects have focused on improvements in transportation, housing and public spaces, and also on the promotion of public education and culture (Lucci et al., 2015). As with PRIMED, the Integrated Urban Projects incorporate community participation in the design and implementation of the projects to ensure their viability and sustainability.

IV. DISCUSSION AND CONCLUDING COMMENTS

33. The case studies only find evidence of upgrading program facilitating incremental adaptation and therefore is likely to fail to offset the ongoing impacts of climate change. Unsurprisingly, given that these upgrading initiatives were not developed directly as a response to climate change, this limitation arises from the lack of assessment of climate risks and vulnerabilities from the outset. Clearly, generating an evidentiary base on the impacts of climate change (including climate projections) among at-risk people is critical for developing adaptation interventions that address the root causes of their vulnerability. Though, Figure 3 suggests a range of priority areas on which such interventions could focus on to better support effective climate action: job creation, skills and training; access to social welfare program – education, health and well-being; access to utilities and basic infrastructure; safe housing and secure tenure; and flexible finance for land, housing development and basic services, the specificities of these interventions should be determined by the results of a risk and vulnerability assessment which identifies the fundamental root causes as to why people are vulnerable to climate change in the first place.

Figure 3. Moving towards integrated strategies of adaptation: multiple points of intervention



34. The three case studies, particularly the Baan Mankong program and Solo city’s relocation initiative, exhibit a range of preconditions necessary for transformational adaptation, including: accountable and responsive government that recognizes local priorities and needs; long history of participatory planning centered on equity and representation; multi-tiered community engagement approach; builds alliances and partnerships through a people centered approach based on trust and accountability; engaged civil society; holistic and long-term thinking; and citywide thinking (see Figure 3). For example, Bang Mankong’s emphasis on facilitating communication and organization of citywide networks means that existing networks among urban activists, academics, policymakers, government officials and community leaders could be leveraged in terms of climate change resilience planning (Berquist et al., 2015). However, there are many barriers to implementing transformational adaptation based on the above principles, such barriers include: lack of political support and leadership, lack of flexibility to develop policies that respond to local concerns, weak inter-institutional coordination, potential tensions or clashes

in attitudes and behaviors among at-risk people, requires extensive outreach to build social trust, and longer timeframes required for potential benefits to be realized.

Despite these barriers, these case studies highlight the importance of flexible, inclusive and iterative planning processes that seek compromise and integrate community ideas to increase the resilience of at-risk people (see Amundsen et al., 2018; Archer et al., 2014; Chu et al., 2015). A key factor that contributed to the success of the initiatives was the degree to which the community felt empowered to act in their own interests with the support of urban development partners (Taylor, 2015). Local governments worldwide are increasingly recognized and used as key respondents to risks, acting as unifiers of local organizations with complementary competencies while being in close exchange with organizations at higher levels if necessary (Archer et al., 2014; Satterthwaite et al., 2012; Melo Zurita et al., 2015). This has the potential to substitute narrowly framed top-down technocratic business-as-usual approaches with more holistic, trustworthy, and transformational approaches based on social and cultural values of people at risk and their underlying vulnerabilities through their active involvement (Satterthwaite et al., 2012; Melo Zurita et al., 2015).

35. Critically, intervening organizations responsible for vulnerability reduction, first, should reflect on their own and wider culture(s) and therein, cultural values, recent and past developments and interactions with other stakeholders in order to be able to identify their potential perception and acceptance by different groups of at-risk people they are intended to support. Second, involve at-risk people in the planning, implementation, and monitoring of responses to risks. This will help develop an understanding of local risk perceptions, cultures, and varying risk priorities, which often give considerable attention to non-climate risks that need to be an integral part of responses to climate risks. Third, consider potential clashes between at-risk people's cultures and organizational cultures; being aware of the different ideas that people have about climate and non-climate risk is critical for achieving more locally acceptable interventions that recognize local knowledge and capacities. However, integrating at-risk people's perceptions of climate change and other risks into external interventions should not occur uncritically; it is important to also consider potential tensions or clashes in attitudes and behaviors among at-risk people and the inequities within local power structures since each inaction or action in dealing with climate risks may trigger subsequent mechanisms, potentially affecting the livelihoods of at-risk people, both those who participate in interventions and those who do not. Since it is challenging to involve all people at risk due to the variety of risk perceptions and power structures, value-based approaches are likely to help identify appropriate context-specific approaches (Graham et al, 2018; Tschakert et al., 2017). While there has been increasing recognition of the necessity of inclusive climate risk and development strategies as well as shifting responsibilities to the local level, more focus needs to be given to the socio-cultural structures and relations between and among intervening organizations and at-risk people that lead to inaction or (in)effective action to climate risks.

V. APPENDICE

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