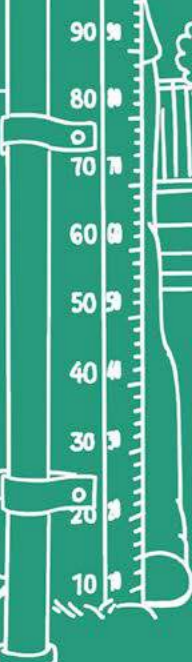




# BUILDING COMMUNITY RESILIENCE



Climate change may mean a wetter, warmer or drier Singapore.  
What can your neighbourhood do to be ready for this?



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# BUILDING COMMUNITY RESILIENCE



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## ABOUT THE ORGANISATIONS

### About the Centre for Liveable Cities

Set up in 2008 by the Ministry of National Development and the then-Ministry of the Environment and Water Resources, the Centre for Liveable Cities (CLC) has its mission “to distil, create and share knowledge on liveable and sustainable cities”. The CLC’s work spans four main areas—Research, Capability Development, Knowledge Platforms, and Advisory. Through these activities, the CLC hopes to provide urban leaders and practitioners with the knowledge and support needed to make our cities better.

CENTRE for  
**LiveableCities**  
SINGAPORE

CLC is a division of  
**MND**  
SINGAPORE

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*Minister for National Development and Minister-in-Charge of Social Services Integration, Singapore*

## FOREWORD

Cities around the world have had to address increasingly complex challenges—from extreme weather attributed to climate change to public health crises. With the threat of even more significant disruptions ahead, cities need to find ways to not just survive and adapt, but to thrive by rising above these challenges. Urban policies and strategies need to be revisited with the aim of achieving resilience in the face of such complex challenges.

Being resilient against multi-faceted challenges requires a whole-of-society effort. Even as we plan our city to withstand and adapt to shocks and disruptions, governments and city leaders must work hand in hand with communities to build capacities and capabilities for resilience amongst the city's residents.

In Singapore, the hardware of our city is designed to support our “heartware”—the social capital that forms the cornerstone of resilient communities. Our neighbourhood and town centres not only provide communities with access to essential amenities but are also vibrant social spaces. Shared social infrastructure such as green spaces and recreational facilities integrated into our neighbourhoods offer opportunities for social bonding and mixing, while enhancing the well-being of the community.

Complementing these infrastructures are new initiatives that enable a more collaborative approach between the public, private and people sectors to tackle more complex challenges that we should anticipate to face in future. Greater opportunities for people to participate in and support citizen-led initiatives can build social capital over time—this is important for a resilient community to be forged, communities that are able to take on new challenges ahead of us and allow us to emerge stronger from crises.

Building resilience in a city is an ongoing effort. Even as cities are adapting to the challenges of today, the next one may hit sooner than we expect. Preparing our built environment is only part of the answer to tackling the complex challenges we will face. It is by building community resilience that we can create a truly resilient city.



**Hugh Lim**

*Executive Director, Centre for Liveable Cities*

## PREFACE

The COVID-19 pandemic has had widespread impact across many domains, affecting our economy, food supply, labour, and social networks. Meanwhile, long-term challenges such as the climate crisis continues to have a wide-ranging impact on humanity. Having to deal with both acute and persistent challenges simultaneously in recent times has highlighted the importance of building up a city's resilience holistically.

At the Centre for Liveable Cities, we believe that a liveable and sustainable city must also be resilient. Our research shows that a truly resilient city requires both infrastructure resilience (hardware) and community resilience (software). The interplay of both gives a city the expanded capacity to handle a range of shocks and stressors, and positions it to bounce back better.

Even as Singapore continues to improve the resilience of its infrastructure and maintains high levels of trust and confidence in the ability of the government to address future challenges, it needs to build cohesive and empowered communities as part of its resilience strategy. In fact, studies from past crises have found that high social capital and strong social networks are some of the most critical drivers for resilience. Experts from across various sectors have stressed the importance of community engagement and participation, and a strong sense of community ownership for a city to be resilient.

To understand how Singapore can engender community resilience, we studied initiatives from across the world to understand best practices and gather useful lessons for Singapore. We also convened partners and stakeholders from across different sectors to embark on a participatory planning journey with us that included inter-agency workshops, community engagements and participatory research. Most crucially, we worked directly with the community to support their citizen-initiated projects and developed a process that can foster a culture of co-creation and co-ownership in them.

Our research tested a series of indicators to gauge levels of resilience in the community. This gives city leaders opportunities to identify strengths and weaknesses in their communities, evaluate the value of any interventions and make effective adjustments to future plans.

It is our hope that our experience contributes to a body of knowledge that will help us build community resilience in our cities. We also hope that it will help us all create cities that can be resilient across various domains, to all forms of challenges.



Chapter 1

# A RESILIENT CITY NEEDS RESILIENT COMMUNITIES

## COMPLEMENTING A CITY'S HARDWARE WITH SOFTWARE



Scan this QR code or visit <https://www.clc.gov.sg/research-publications/publications/books/view/a-resilient-singapore> to read the full publication.

“  
Resilience requires us to take an integrated systems approach. It is as much about robust infrastructure and plans as it is about involving and engaging diverse stakeholders.”

— *A Resilient Singapore, Centre for Liveable Cities and 100 Resilient Cities (2018)*

Cities are facing increasingly complex and dynamic challenges including a climate crisis and public health crisis, alongside technological shifts and social upheavals. As more than half of the world's population reside in cities<sup>1</sup> and with cities accounting for more than 80% of the world's gross domestic product,<sup>2</sup> the stakes are high. Many of today's challenges cut across different domains and require cities to rethink existing strategies and develop adaptive capacities in order to not just survive, but thrive, even when shocks or stressors are encountered.

The concept of resilience has been in Singapore's DNA since its independence in 1965. As an island city-state, Singapore had to contend with a range of domestic and external stressors, and the threat of acute shocks such as the recent COVID-19 pandemic. In 2018, the Centre for Liveable Cities (CLC) collaborated with the-then 100 Resilient Cities to document what Singapore had done and will continue to do to build its resilience. The exercise highlighted the country's success, which included building long-term infrastructural resilience based on integrated long-term planning and urban governance, and identified Singapore's urban resilience efforts in view of future challenges. The study also highlighted opportunities for Singapore to further empower a broader range of stakeholders and do more in promoting and engaging cohesive communities. This is particularly relevant considering how the full impact of risk events may not all be predicted nor protected against; therefore, community resilience will be key in addressing such scenarios.

Today, sustainability, liveability, and resilience are central to Singapore's urban development. Ongoing efforts have strengthened its resilience to many complex issues such as climate change. On that front, the Singapore government has

launched the Singapore Green Plan 2030 to put it in better stead to address and face the impact of climate change. Plans are being rolled out to grow a City in Nature through the planting of one million more trees by 2030, green the national grid, cultivate a green economy, promote a sustainable way of life and develop adaptation plans against the threat of sea-level rise.

Yet, building resilience is not only about enhancing our infrastructure but strengthening our social capital. Dealing with disruptions not only requires competent leadership and governance but also demands a whole-of-society approach, with citizens at the core as collaborators and partners in the solutioning process. This aligns with the Singapore Together movement launched in 2019, to create more partnership opportunities for citizens to participate in and provide support for citizen-led initiatives.

Hence, for a resilience strategy to be comprehensive, it must be created and implemented with the community, by the community. Individuals and communities that actively contribute and act in the face of shocks and stressors are assets to a city, because in times of crises, they will be more decisive and able to take up critical roles. Without a resilient community, there can be no resilient city.

**For a resilience strategy to be comprehensive, it must be created and implemented with the community, by the community.**

# STRENGTHENING SOCIAL CAPITAL

## Definition

Community resilience can be understood as the capacity for communities to adapt, survive, and thrive in the face of shocks and stressors. This is enabled by both the physical and social infrastructure in the built environment to facilitate the ability to bounce back stronger than before.<sup>3</sup>

Exactly what are these infrastructures? In general, physical infrastructure refers to the physical structures in cities that ensure its

functioning, including roads, sewer systems, electrical grids and coastal protection, among others. On the other hand, social infrastructure comprises infrastructure that facilitate interactions among people which build social capital—the value of networks of relationship and trust that exist in our society; this includes parks, libraries, transportation networks and community health facilities.<sup>4</sup>

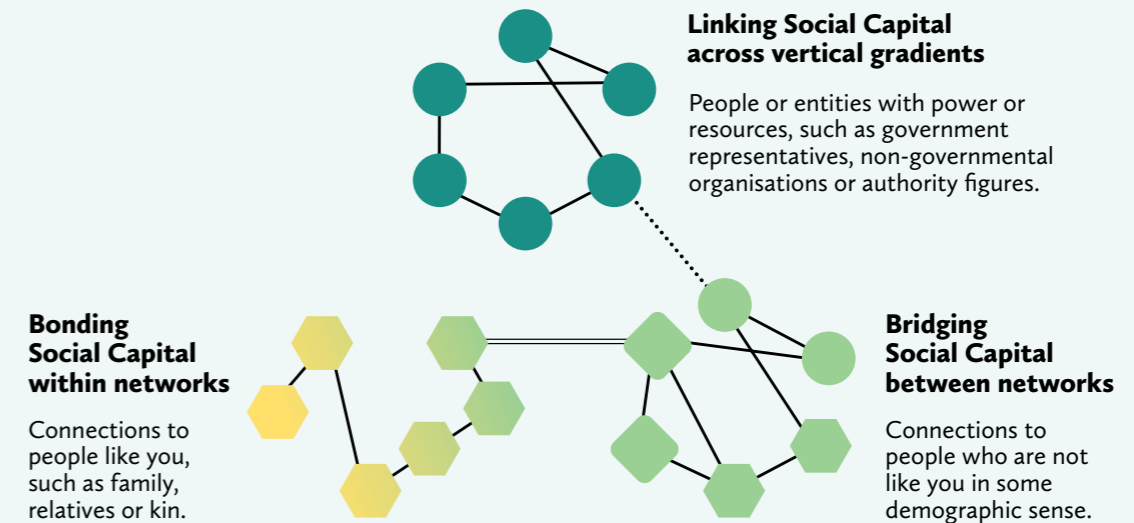
Together, both categories of infrastructure work in tandem to make the built environment both a platform for and an enabler of community resilience.



Social capital can be built through social infrastructure that are present within our daily lives. Source: Kelman Chiang, Singapore Research Nexus, SG Photobank, CC BY-SA 4.0, cropped from original

## Social Capital and the Built Environment

An appreciation of social capital is fundamental to understanding what community resilience is and how to build it. A trio of social ties—bonding, bridging and linking—serve different functions in building a community's capacity to adapt to shocks and stressors. The relationships between these networks need to be studied.



The interplay between bonding, bridging and linking ties illustrates different forms of social capital. Source: Daniel Aldrich

Strong connections within a community (i.e., bonding social capital) and between different communities within a society (i.e., bridging social capital) serve as good foundations for community responses in the face of shocks and stressors. For example, during times of crisis, recovery efforts can tap on these existing connections and channel aid towards segments of the society who need it most, such as the aged and vulnerable.

Similarly, strong links between communities, businesses, and government agencies (i.e., linking social capital) can increase the effectiveness of operationalising new policies and projects. A strongly interconnected society with high levels of trust can help to accelerate the adoption of best practices and build stronger support for new and innovative approaches to complex long-term challenges.

The built environment supports the community-resilience agenda in various ways across times of peace, crisis, and recovery, and is a valuable physical resource for the community. In times of crisis, the interim use of spaces for

community initiatives can support mutual aid efforts and become venues where communities can be mobilised and activities organised. Social infrastructure offers a venue for social exchanges and enables people to build social capital within the community.

Beyond enabling community action and activities, the process of planning, constructing, and operating infrastructure also offers opportunities to strengthen and enhance a community's social capital and, in turn, its resilience. Various upstream and downstream processes behind infrastructural projects can become platforms to engender community resilience through the cultivation of ties and trust, as well as strengthening of networks. For example, infrastructural projects and enhancements that are created with communities through in-depth engagement mechanisms such as participatory planning and design, offer opportunities for various segments of the community to build social capital. These mechanisms offer opportunities for members of the community to build confidence and capabilities to act in the face of shocks and stressors.



## From “For the People” to “With the People”

Singapore has long recognised the importance of the built environment in supporting social capital, as demonstrated by its public housing efforts and focus on quality public spaces. What has evolved however, is its approach.

Singapore has, in recent years, developed a range of initiatives and platforms to further engage its citizens in the built environment development process, with the goal of fostering a greater sense of ownership. To this end, Singapore has been moving beyond mere consultation towards deeper engagement processes, such as participatory design and planning approaches for select projects. At the same time, schemes to support community-led initiatives have been devised to enable citizens to shape their own built environment.

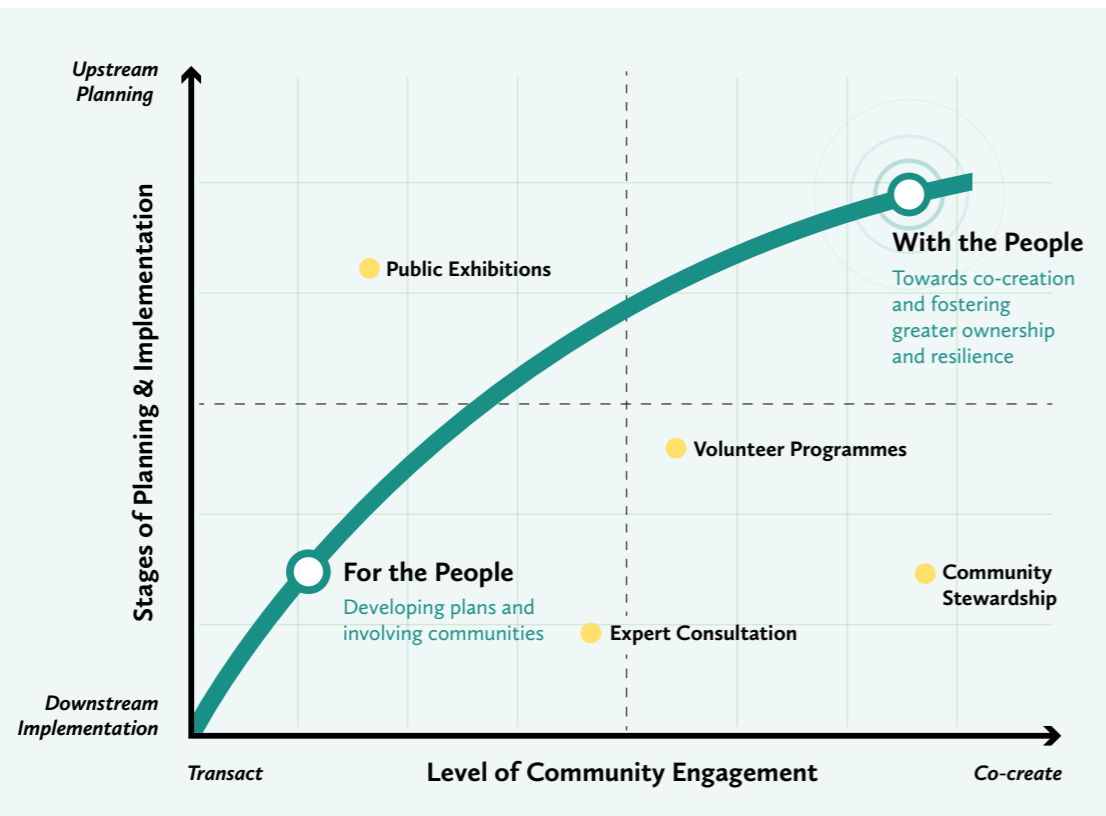


Illustration of the degrees of community engagement in Singapore at different stages of planning and implementation, and the value of incorporating greater co-creation in upstream planning. Source: CLC

## Landscape Scan of Initiatives Involving Participatory Design and Engagements in Singapore’s Built Environment Sector

Project	Lead Agency	Level of Engagement	Outcome
<b>ABC Waters Programme</b> (2006–ongoing)	PUB, Singapore’s National Water Agency	<ul style="list-style-type: none"> <li>◆ Consultation sessions with grassroots leaders to educate on the programme and obtain buy-in for projects.</li> <li>◆ Exhibitions to educate the public on the potential and impact of ABC Waters via exhibitions.</li> <li>◆ Outreach programmes (e.g., in schools) to educate the public on ABC Waters.</li> </ul>	ABC Waters in many locations across Singapore. Higher integration of green and blue into urban development.
<b>Neighbourhood Renewal Programme</b> (2007–ongoing)	Housing & Development Board (HDB)	<ul style="list-style-type: none"> <li>◆ Public consultation through dialogue sessions, exhibitions, and surveys.</li> <li>◆ Feedback incorporated into design proposal. Projects to proceed upon 75% support from eligible owners.</li> </ul>	Town Councils have provided common facilities and improvements in the neighbourhoods, in consultation with the community.
<b>Rail Corridor</b> (2011–ongoing)	National Parks Board (NParks), Urban Redevelopment Authority (URA)	<ul style="list-style-type: none"> <li>◆ Extensive public engagement with diverse groups of people on their aspirations for the Rail Corridor, including an ideas competition, a Request for Proposal exercise, roving exhibitions, student and community workshops, and a dedicated website for the public to contribute ideas and provide feedback.</li> <li>◆ The Rail Corridor Partnership—a consultation group comprising members from nature and heritage groups, and other stakeholders—was formed to chart its future development directions.</li> <li>◆ A Friends of Rail Corridor community group formed to collectively shape future development and cultivate stewardship for the Rail Corridor as a shared community space.</li> </ul>	A shared vision of the Rail Corridor as a community space was distilled and a set of planning and design goals were developed to guide its development.
<b>Re-imagining Tampines – Local Planning Pilot</b> (2014–2017)	CLC, HDB, Land Transport Authority (LTA), People’s Association (PA), URA	<ul style="list-style-type: none"> <li>◆ Adopted an evidence-based approach to improve Tampines town, combining both hardware and software.</li> <li>◆ Collaborative discussion platform set up through multi-stakeholder workshops, involvement of professional practitioners, and support of students from the National University of Singapore for ground observations.</li> <li>◆ User engagement through platforms such as community workshops and pop-up engagement booths.</li> </ul>	Developed the Tampines Liveability Blueprint, a framework that articulates a vision for a more liveable and sustainable Tampines.

Project	Lead Agency	Level of Engagement	Outcome
<b>Build-A-Playground</b> (2017–ongoing)	HDB	<ul style="list-style-type: none"> <li>◆ The first playground built after consulting and involving residents and students of the neighbourhood.</li> <li>◆ Process involved a series of engagement activities such as design workshops, roadshows, and surveys.</li> </ul>	Successfully designed and constructed the playground with the community in 2018. Since then, the HDB has expanded this initiative for playgrounds in other towns.
<b>Lively Places Programme</b> (2016–ongoing)	HDB, URA	<ul style="list-style-type: none"> <li>◆ Support community-led efforts in enlivening Singapore’s public spaces.</li> <li>◆ Participants organise activities in public spaces and streets that bring communities together and/or create installations that inject community/social identities into public spaces.</li> </ul>	As at end February 2022, the programme has disbursed/committed around \$800,000 to support 186 community projects, clocking \$2,160,000 worth of community match benefiting 92,600 stakeholders.
<b>Community-in-Bloom</b> (2005–ongoing)	NParks	<ul style="list-style-type: none"> <li>◆ Nationwide gardening movement that brings communities together to create beautiful gardens and contribute to making Singapore a City in Nature.</li> <li>◆ Provides support and advice for passionate gardeners to set up, care for and maintain community gardens.</li> </ul>	More than 1,700 community gardens and around 40,000 gardening enthusiasts are participating in the programme.
<b>Friends of the Parks</b> (2016–ongoing)	NParks	<ul style="list-style-type: none"> <li>◆ A ground-led initiative comprising stakeholders and volunteers to promote stewardship and responsible use of Singapore’s parks.</li> </ul>	11 Friends of the Parks groups have since been set up.

While concerted engagement efforts have helped to imbue a sense of ownership of the city among Singaporeans, the landscape scan (above) surfaced opportunities to incorporate more intentional resilience-building processes. Current efforts focus mainly on building vibrancy and encourage community decision-making; however, more could be done to co-develop community responses to stressors and to build capacity to recover from shocks.

All around the world, there are many successful examples of communities working together

to explore interventions and responses towards local challenges. These citizen-initiated initiatives range from small projects such as demonstrations and awareness campaigns, to more medium-sized interventions like the formation of community self-help groups that are always contextual to the needs of the community. Beyond simply attempting to solve local issues, these efforts have the broader purpose of cultivating relevant capabilities and social connections necessary for the community to survive, adapt, and thrive in the face of crises.

CASE STUDY

## Ibasha Concept in Post-Disaster Recovery

Beyond building social capital through trust and a sense of ownership, one programme that has proven effective at broadening networks, deepening a sense of belonging, and helping people feel more in control of their lives is the Ibasha programme developed in Massaki-cho, Japan. The concept of Ibasha draws from its namesake Japanese term to describe “a place where one feels a sense of belonging and purpose and is accepted as oneself”.<sup>5</sup> The Ibasha programme was set up after the 3/11 Fukushima triple disaster. Most of the community had been displaced from their residences and forced to relocate to temporary shelters. Emi Kiyota, the founder and director of Ibasha, and her founding team of local elderly residents raised funds to build a community centre.

Under the Ibasha programme, residents decide what activities the community centre would provide; activities they believe will interest the community, such as cooking classes, yoga, reading clubs, and communal aerobics. They then invite friends and neighbours to join in the activities. This simple strategy works. Since the programme started, the number of people with whom the elderly interact has increased and as the elderly widened their social networks, their sense of community has also increased.

The programme has been so successful that it has been replicated in the Philippines and Nepal, with initial data analyses revealing similarly positive effects. Ibasha is a programme which requires relatively low physical infrastructure to function. A permanent meeting space within walking distance of potential members is all the physical infrastructure that is needed to enhance the social infrastructure of a neighbourhood.

Run by the elderly, Ibasha Café creates opportunities for them to interact with other community members. This improves social ties and empowers the elderly to make their community a better place. Source: Ibasha



## CASE STUDY

### Harnessing the Potential of Local Characteristics—Retain Your Rain Programme

The American coastal city of Norfolk, Virginia, faces increasing threats from tidal to pluvial floods annually. In recent years, this phenomenon has worsened with rising sea levels and intense rainfall. As part of its Resilient City strategy, Norfolk has applied small and medium-scale efforts to adapt.

To allow people to live, adapt and thrive with water, Norfolk embarked on a programme to develop small-scale projects in flood-prone neighbourhoods. Residents attended workshops to learn about water flow, the application of water storage and infiltration functions of the soil in their neighbourhood, and how varying ground conditions affect them. Through the application of small-scale green infrastructure such as rain barrels, planter systems, and blue and green roofs to hold rainwater, residents were able to collectively reduce the surface runoff of water in their neighbourhoods, thereby addressing the flooding issue. By building awareness in the neighbourhood, residents were empowered to lead and scale these projects.



The Norfolk Resilience Office continues to organise local demonstrations to encourage a collective community effort in addressing the flooding issue. The programme brought residents and civic societies together to participate and pool resources; a “Retain Your Rain” workshop developed enough rain gardens and bioswales with the capacity to divert 600 gallons of stormwater. To support and sustain these resilience efforts, the city provides grants to neighbourhoods and non-profit organisations that are looking to implement interventions to address flooding issues. Inspired by the programme, the city of Paris has established their greening permit initiative to integrate residents’ involvement in plans to manage stormwater.

Small-scale projects that residents can implement at home help mitigate flooding and allow them to participate in building and sustaining the city’s resilience. Source: *The City of Norfolk*

This suggests several questions regarding Singapore’s approach to building community resilience. Can there be a more deliberate community resilience-building intention embedded in these co-creation processes? Can we build community resilience by design? How might we give form to the invisible sense of community resilience in the built environment?

The upcoming chapters share the CLC’s journey of partnering with the community to build community resilience through the built environment. It documents the possibilities for a more meaningful and impactful partnership process, where ordinary members of the public come on board and support not just individual

communities but also broader national efforts. In this journey, the CLC researched and developed frameworks and systems that help community members, government agencies and other stakeholders better understand local needs, appreciate existing assets and resources, and develop interventions to address local challenges. A framework to measure the state of community resilience was also developed and piloted so that communities and policymakers could diagnose strengths and weaknesses and evaluate progress over time. The hope is that the lessons from this experience can be applied to help build more resilient communities and hence, more resilient cities.

**Can there be a more deliberate community resilience-building intention embedded in these co-creation processes? Can we build community resilience by design? How might we give form to the invisible sense of community resilience in the built environment?**



**Lauren Sorkin**  
Executive Director, Resilient Cities Network

## OPINION

# ADVANCING THE GLOBAL RESILIENCE AGENDA, ONE CITY AT A TIME

Cities deliver. In the words of Houston's Mayor Sylvester Turner, Chair of the Resilient Cities Network Board, "Cities are the boots on the ground. Cities are the boats in the water. Cities are the closest to the people." City leaders and governments are responsible for effectuating change and supporting the systems necessary for allowing cities to thrive.

The COVID-19 pandemic and continuous onslaught of extreme weather events around the world have foregrounded the need to build urban resilience. The Resilient Cities Network (R-Cities) takes a city-led approach to building the capacity of local governments to assess risk and respond to shocks and stressors facing their communities in an effective and equitable manner. R-Cities supports peer-to-peer sharing across a global network of nearly 100 cities in 40 countries and 6 continents, and empowers city leaders to develop resilience strategies that can adapt to unpredicted circumstances in the future. Some of our recent efforts include [Urban Ocean](#), [Cities on the Frontline Speaker Series](#), and our recently launched [Urban Exchange Podcast](#).

Beyond the physical infrastructure and good governance needed to protect a city from threats, social ties and collective action are just as important in building up a community's resilience to shocks and stressors.

We have witnessed this in Singapore which, in recent years, has seen an uptick in heavy rainfall, flash floods, and higher temperatures. The increasing impacts of climate change are putting pressure on its hard defences and testing the



Good physical infrastructure, governance and collective action are some of the key elements to build up a city's resilience.  
Source: CLC

city's resilience. Singapore is now looking towards softer, non-structural approaches to complement its robust physical infrastructure, in building urban and community resilience.

To build community resilience to climate change, the CLC partnered with R-Cities and Rebuild by Design in 2019 to advance our joint expertise in participatory and collaborative planning in the Cambridge Road project. The Cambridge Road site was identified due to its low-lying nature, making it prone to flash floods and, importantly, for its potential to localise interventions for the community.

One local intervention in the Cambridge Road project that helped build community and climate resilience in this case was tree planting and community-greening. This was a simple yet effective effort to not only increase the community's awareness of climate change and the value of working together as a team, but also create better water and carbon absorption capacity in the area. This intervention drew its inspiration from various members of the R-Cities network, where communities and city authorities collaborated on projects such as OASIS (Openness, Adaptation, Sensitisation, Innovation, and Social Ties) in Paris, Retain

Your Rain in Norfolk, and the Luchtsingel in Rotterdam. This project highlighted the importance of strengthening community bonds to co-create local place-based projects that would improve the neighbourhood's adaptive capacity to climate change and build community resilience.

By bringing together knowledge, partnerships, and funding, R-Cities supports communities through times of shocks and stressors to build city resilience. We firmly believe that working together as a city-led network is the most effective way to build more sustainable and equitable communities, advancing the global resilience agenda, one city at a time.

**Social ties and collective action are just as important in building up a community's resilience to shocks and stressors.**



Building up an ecosystem of stakeholders is critical to support resilience-building. *Source: CLC*

## Chapter 2

# BUILDING AN ECOSYSTEM FOR RESILIENCE—FRAMEWORKS AND APPROACHES

If community resilience is the capacity for communities to adapt, survive, and thrive in the face of shocks and stressors, then how should one foster, build, and measure it? How would one know if the efforts are even working?

This chapter highlights the two key frameworks that the Centre for Liveable Cities (CLC) considers foundational in the community resilience-building process: an integrated multi-stakeholder engagement framework, and a community resilience indicator framework.



A multi-stakeholder approach facilitates the integration of different goals, objectives and capabilities to build resilience. Source: CLC

## AN INTEGRATED MULTI-STAKEHOLDER APPROACH

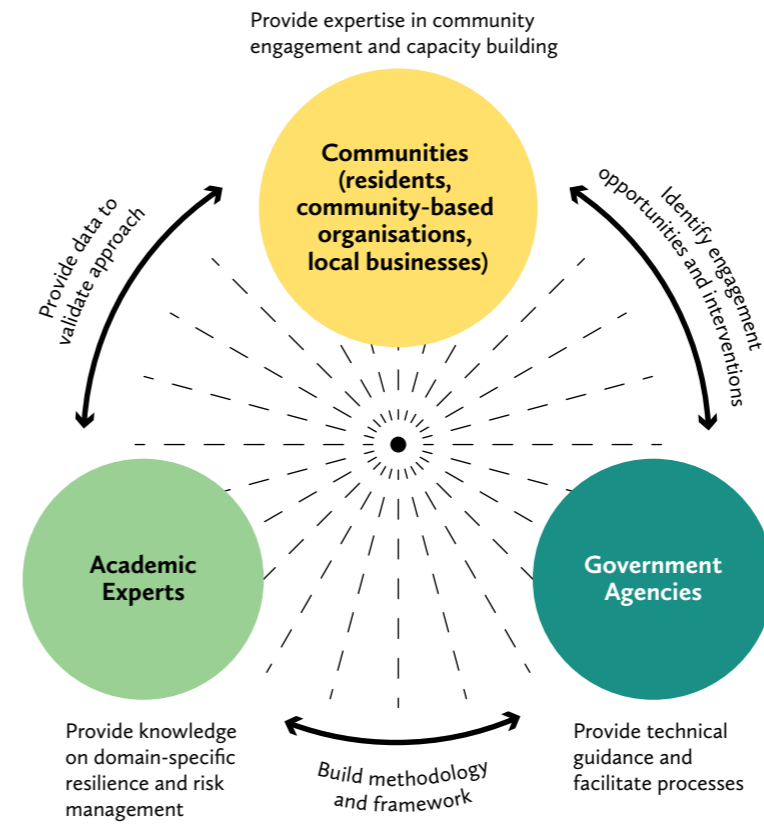
### Building Community with the Community

The key to building community resilience is the process itself.

While it may be more efficient to break down complex challenges into separate components to be managed by various stakeholders, the interconnectedness of present-day challenges calls for an integrated approach. For a community to be resilient to unknown shocks, there is a need for close collaboration within an ecosystem of stakeholders across various

domains and a range of expertise. Everyone has a role to play, and a resilient community is one where individuals within the community complement each other's strengths and mitigate each other's weaknesses.

Beyond a combination of knowledge and assets, collaborative partnerships also cultivate social connections across different classes and backgrounds. The exchange of knowledge, expertise, and experiences that come with such collaborations are opportunities for the community to bond, bridge, and link their social capital. When community members extend their generosity towards one another, trust and goodwill is built, which in turn leads to stronger and more robust relationships within the community.



With the understanding that community resilience is built through participatory processes, increasing community participation and inclusiveness in shaping the built environment sector has become a key strategy. High-touch engagement approaches not only build social capital but also help to foster a shared sense of ownership of problem-solving among the community. Such processes also offer platforms for various stakeholders to come together and collaborate in various ways to serve local communities. Community resilience-building is a whole-of-society effort.

Convening an ecosystem of stakeholders facilitates bridging a common understanding of what community resilience is and what it means to various stakeholders. Source: CLC

### Bringing Together an Ecosystem of Stakeholders

A mature city may be characterised by greater specialisation of functions and a more independent society. As such, an ecosystem of stakeholders is necessary to build community resilience, and there remains the question on how they would interact and support one another in the context of a project. This led us to adopt a systems approach to integrate the different goals, objectives, and capabilities of various stakeholders into a multi-stakeholder framework that can be applied in projects with the intention to build community resilience.

At a broad level, the framework's role is to help all stakeholders:

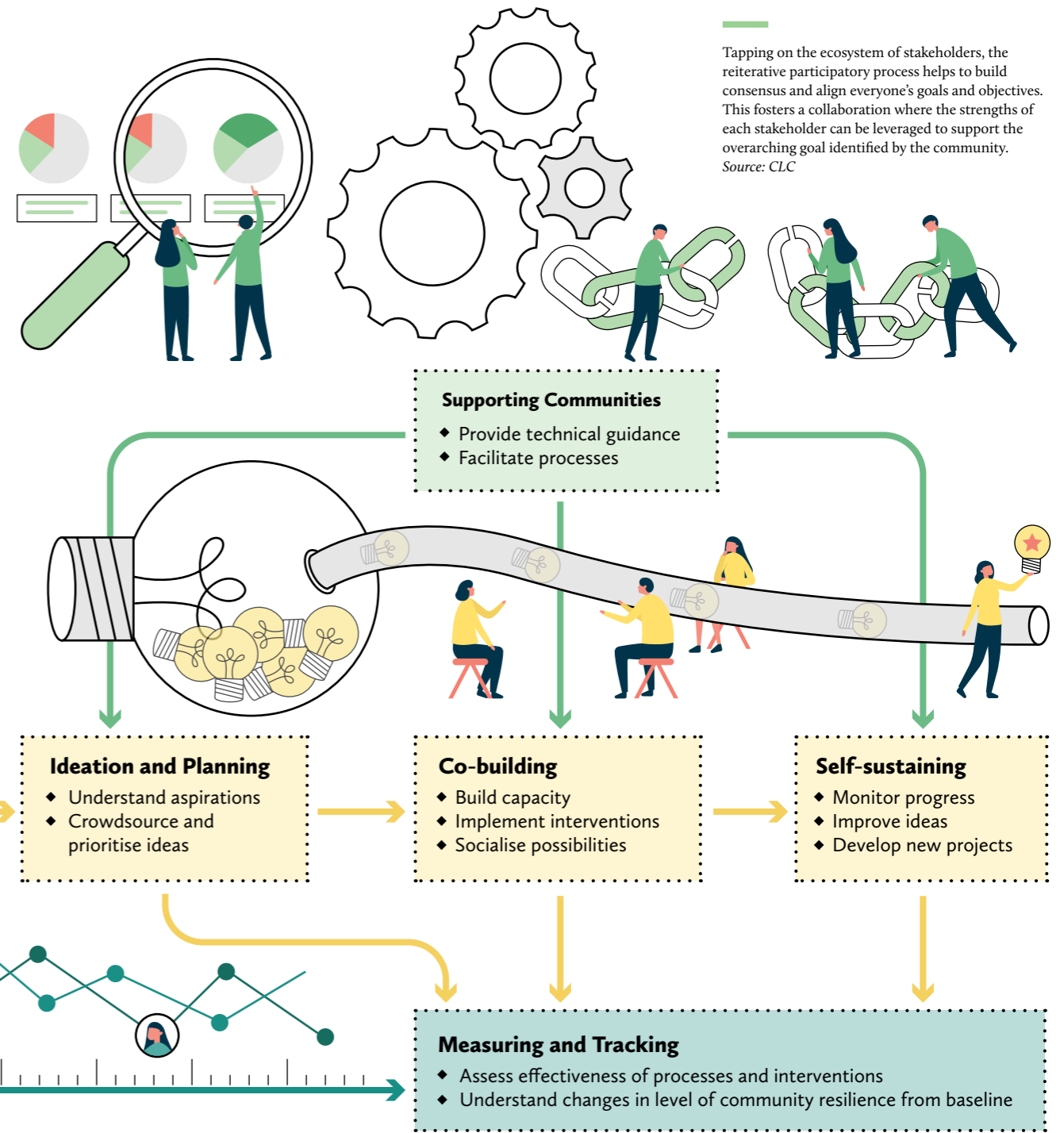
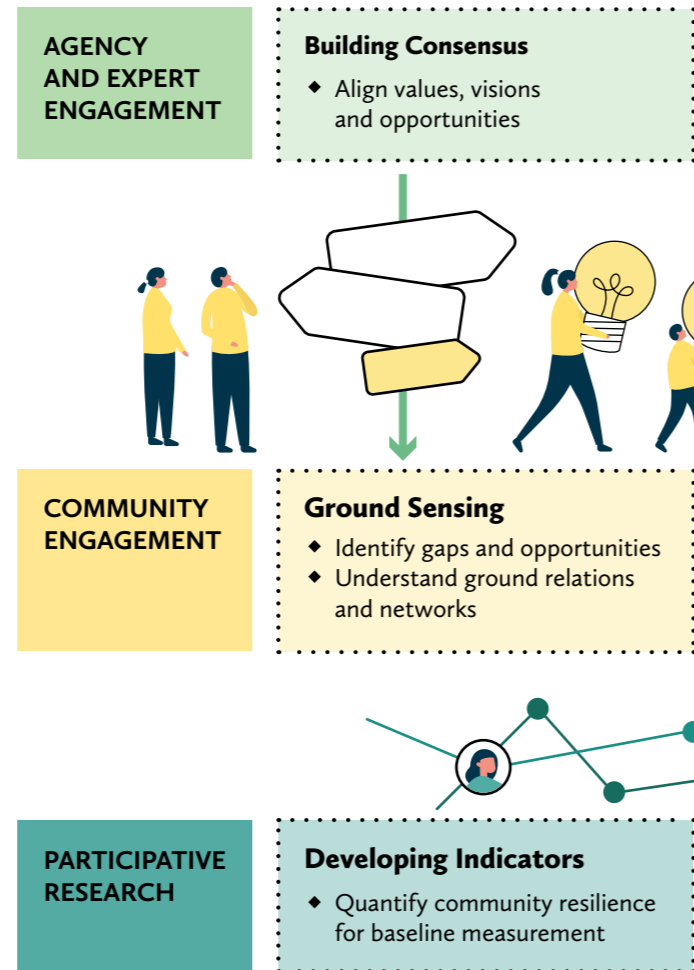
- ◆ Develop a common understanding of local issues and alignment on possible responses
- ◆ Develop relationships across various domains and sectors
- ◆ Identify gaps, and gain resources, knowledge, and capacities needed to execute and sustain community initiatives



## A Multi-Stakeholder Framework

The framework revolves around three layers of engagement:

- 1 Engagement with government agencies seeks alignment on values, visions and opportunities on the broader goal. It also develops a sandbox for community actions and facilitates community support through knowledge and resources.
- 2 Community engagements involve understanding ground aspirations vis-à-vis national goals, and crowdsourcing of feedback and ideas. The engagements facilitate the building of social capital, as well as capacities and capabilities to deal with shocks and stressors.
- 3 Knowledge experts are engaged for domain-specific best practices, frameworks, and tools. They develop indicators to measure and quantify action outcomes, which is useful in evaluating progress over time.



Tapping on the ecosystem of stakeholders, the reiterative participatory process helps to build consensus and align everyone's goals and objectives. This fosters a collaboration where the strengths of each stakeholder can be leveraged to support the overarching goal identified by the community.  
Source: CLC

# A COMMUNITY-RESILIENCE INDICATOR FRAMEWORK

## A Global Landscape Scan for Indicators

There is currently a global move in adopting integrated risk-based approaches to understand how people build capacities; not just to endure, but better prepare, plan, absorb and recover from shocks and stressors. This requires tools that can take snapshots of the characteristics of community resilience as they manifest, and the factors that are critical in contributing towards building resilience. However, as resilience is largely intangible, scientists and decision-makers have tended to rely on indicators as proxies to evaluate and measure resilience.

The initial use of indicators to assess resilience stemmed primarily from studies on post-disaster recovery. In studies from North America, Europe, Asia and Australia, resilience to climate change-related hazards and natural disasters were investigated.<sup>6</sup> In such studies, factors contributing to disaster recovery amongst local communities are examined, and strategies identified, to prevent and mitigate fall out from future disasters.

These studies used a range of indicators to find out a community's exposure and vulnerability to risk, as well as to identify various dimensions within the social systems that would influence their resilience. Indicators common across studies included, but were not limited to, social capital (social bonds, community networks and engagements, social support), social cohesion (trust between communities and with authorities, sense of community, leadership, community goals and efficacy), community capital (knowledge and awareness of risk, competence, availability, and access to essential services), and human capital (lifestyle demographic, socio-economic characteristics, health, and physical abilities).



Social ties at work as survivors help each other through the havoc wrecked by the 3/11 tsunami in Tohoku, Japan.  
Source: Warren Antiola/Flickr, CC BY-NC-ND

When the risk study was narrowed down to climate change-related hazards, indicators relating to occupation, housing type, and risk knowledge and awareness emerged frequently. This reflected the impact of climate change on human capital, and the perceived awareness of risk that could mitigate its impact. The studies also revealed that social capital indicators such as community preparedness and sense of community were the key focus of studies pertaining to terrorism, violence, and multiple

disasters. These indicators were found to be strong enablers in driving adaptation and resilience-building. Social capital indicators such as community preparedness and mutual trust were also found to be more prevalent in Asia, which was reflective of the nature of disasters in this region, as these crises required collective community effort to survive, adapt and thrive. In contrast, studies in Europe were more focussed on indicators relating to community engagement and access to essential services.<sup>7</sup>



Examining recovery efforts from events such as Japan's 3/11 disasters offer insights into the role of resilience in building back homes, businesses and lives. Source: Daniel Aldrich



As recovery efforts were ongoing following Japan's 3/11 disasters, the community rallied to set up temporary classrooms in evacuation centres. Source: Warren Antiola/Flickr, CC BY-NC-ND



In addition to disaster-related studies, city-level frameworks have been developed to examine the state of resilience at the city scale on other domains such as health, economic and well-being. For example, the City Resilience Framework, developed by Arup with support from the Rockefeller Foundation, offers cities a means to assess their degree of resilience using 52 indicators across 4 domain areas, covering both social and human capital, physical and social infrastructure, as well as institutional and economic systems.<sup>8</sup> Similarly, the Argonne National Laboratory, with support from the United States Department of Homeland Security, uses 20 indicators on human capital and access to essential services, to prioritise communities in need of assistance.<sup>9</sup>

It is acknowledged that these frameworks and indicators are derived from varying and differing assumptions and scope that each study considers important, which in turn influences the choice of indicators used to measure resilience. This reflects the differences in local contexts and priorities in which these indicators were developed for. However, despite these differences, studies across a broad range do converge to reveal two common elements that shape the capacities of communities to better adapt and build resilience: 1. The presence of resources necessary for adaptation, i.e., information and knowledge; and 2. The presence of competences and systems in managing and utilising resources, i.e., social connections (infrastructure and capital).<sup>10</sup>

## Characteristics of the CLC's Community Resilience Indicator Framework

Given that resilience-building measures have been recognised to be most meaningful at the community level,<sup>11</sup> the CLC focused on developing indicators—through a community lens—to understand how a community's capacity to deal with shocks and stressors

could be sustained and enhanced. Based on the insights gathered from the landscape scan, emphasis was placed on indicators relating to two key priorities: 1. Knowledge and Awareness of Risk; and 2. Social Capital and Cohesion.

### CLC's Community Resilience Indicators

Community Resilience Attribute	Indicator and its Definition
Knowledge and Awareness of Risk	Informational Knowledge: level of knowledge and understanding of risk
	Actionable Knowledge: level of knowledge on actions that can be taken to address risk
	Intention to Act: level of motivation to cope with and adapt to risk
Social Capital and Cohesion	Community Bonds: extent to which community members help one another and work together
	Community Trust: level of trust within the community
	Sense of Community: sense of belonging and attachment to the community
	Community Engagement: sense of participation, collaboration and empowerment in the community
	Collective Efficacy: level of cooperation towards collective community outcomes
	Crisis Preparedness: level of knowledge on how to behave in crisis situations

A community's awareness of risk provides an indication of how well a community assesses and addresses vulnerabilities. The higher a community's level of knowledge, and the greater a community's motivation, the more able a community is when faced with crisis. In doing so, it can contribute towards impact reduction from shocks or stressors, thereby building community resilience.

Social capital and cohesion of communities provides an indication of the nature, strength, and networks of relationships between

community members. Building up social capital and cohesion can enhance the network of adaptive capacities within a community that can be readily activated before, during and after a shock or stress. Strong connections between people, supported by robust community bonds, mutual trust, the sense of community and community engagement, help to build up the ability of community members to cope, survive and thrive. Social capital and cohesion are effective in dealing with potential disruptions and should be fostered, so that they can be called upon when a crisis occurs.



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**Dr Jonas Joerin**

*Co-Director, Singapore-ETH Centre (Future Resilient Systems)*

## OPINION

# THE CASE FOR USING HARD (SCIENTIFIC) APPROACHES TO UNDERSTAND HEART (HUMAN) ISSUES

Social resilience has emerged as a concept to explain how individuals and communities absorb, cope with and adapt to environmental and social threats. It complements established risk-management approaches and supports efforts in connecting individuals, groups, and organisations before, during and after disruptions. A structured approach is required to better understand social resilience and human issues, which can be rather conceptual. By applying quantitative and qualitative methods, key factors fostering or impeding social resilience can be identified, which is useful and relevant for responding to future shocks and stressors.

Singapore is currently experiencing more intense rainfall events than usual. These events cause local flooding, disrupt mobility and damage infrastructure. Climate change is expected to increase the number and intensity of climate-related disasters in the future. This calls for action to make sure that communities are well prepared to cope with the impacts of climate change. Furthermore, understanding community structures, the sensitivities of specific groups, as well as the strength and role of social networks will help in implementing suitable resilience-increasing measures.

Surveys and interviews were conducted among the Cambridge Road residents to understand how key social resilience indicators (climate change awareness and social capital) changed after conducting community engagement activities like community crowdsourcing



Participation in community engagement activities can strengthen social fabric. *Source: CLC*

through pop-up booths and awareness-raising events like tree-planting in the community. Findings from the survey and interviews showed that increased participation in community engagement activities enhanced social connections, community engagement, and level of trust towards community leaders. The Cambridge Road project showed that community engagement activities can raise people's awareness about climate change and simultaneously strengthen the social fabric.

However, while collective action proved to be critical in managing climate-related risks, our ongoing comparative study of social resilience during the COVID-19 pandemic in Singapore and Switzerland uncovered a different perspective.<sup>12</sup> Despite the constraints of social distancing measures giving rise to limited social interactions, social cohesion nonetheless emerged as a critical feature in managing the pandemic. Because of the high level of trust between communities and political leaders, large segments of the population were willing to comply with the rules laid down by the government to manage the pandemic. Trust will also play an important role in restoring “normality” when the pandemic abates.

Different threats influence the types of social capital that can be tapped on and mobilised in times of need. To adapt to constraints created by the COVID-19 pandemic, new digital technologies were deployed to provide alternative avenues to foster social and community resilience. People and businesses adopted digital technology to overcome disruptions caused by the COVID-19 restrictions. The proliferation of information technology in the use of delivery services, work exchanges and community engagement using video conferencing and adaptations to work from home are some examples.

Independent of concrete threats like climate change or a pandemic, individuals, groups, communities and organisations are increasingly dependent on technological, economic, political and environmental systems. The development of these systems also depend on the interaction between individuals, groups, communities and organisations, and the systems. The better the interaction, the better equipped communities will be in managing threats. It is thus imperative to support measures that strengthen these links.



## Chapter 3

# CASE STUDY: THE CAMBRIDGE COMMUNITY, SINGAPORE

The multi-faceted challenge of climate change facing Singapore offers an opportunity to unpack and explore answers to these questions. Even for a relatively small country, the challenges of climate change manifest in different ways for different communities and neighbourhoods. The communities are all unique and do not share the same assets, experience the same level of vulnerability or have to make the same trade-offs in the face of challenges.

In 2019, the Centre for Liveable Cities (CLC) embarked on a pilot study with the aim of developing a proof-of-concept for building community resilience by design. Using climate change as the premise, the CLC put the multi-stakeholder framework described in Chapter 2 into practice and piloted a participatory planning exercise. The CLC also focused on co-creating interventions with the community to address local climate challenges and improve their quality of life.

In this project, the community was involved in the early planning and ideation process, and subsequently with the actual implementation and maintenance of the interventions. A phased

approach was taken, focusing on short-to-mid-term interventions that would complement future longer-term solutions.

This chapter illustrates the CLC's journey in building up the groundwork of this project with the stakeholders, designing with the community and supporting community-owned interventions.

Although this journey focuses on climate change as the premise for experimentation and research, the aspiration is that lessons and insights from this experience can be applied to address other shocks and stressors.



Roundtable discussions and workshops between agency stakeholders and knowledge experts facilitated knowledge sharing on best practices for participatory planning for community resilience, and alignment on objectives and values of the study.  
Source: CLC

## LAYING THE GROUNDWORK

### Charting Opportunities to Do Things Differently

To kickstart the participatory approach, the CLC organised several workshops to align government stakeholders with the concept of community resilience and envision partnership

possibilities with the community. These workshops allowed agency stakeholders to understand the value of community resilience and how it could complement physical infrastructure in building overall resilience.

Most importantly, various stakeholders recognised the partnership process as a vital first step in building confidence amongst them. It enabled a better understanding of the existing limitations of current solutions, and encouraged greater conversations on innovative, community-led interventions that could help prepare for future risks.

These initial engagements included roundtable discussions with knowledge experts to understand and distil best practices that could be applied in Singapore. For example, Dutch experts were consulted on stormwater management and social programming in the Netherlands to address anticipated challenges of sea level rise. Rebuild by Design, an initiative in the United States, provided insight into the collaborative, design-driven, problem-solving approaches that brought together government entities, businesses, non-profit and community organisations to help communities and cities build resilience after Hurricane Sandy (see the Case Study for details on the Rebuild by Design model).

Insights from these engagements guided the approach for the study, such as the value of integrating community efforts into long-term planning and building awareness amongst communities. Agencies recognised the important role they can play in sharing technical knowledge and building confidence with the community to empower their ability to contribute.





Small group meetings and community outreach events allowed city planners to understand their communities better. Source: *Rebuild by Design/Cameron Baylock*

A vital lesson learned from the RbD process was that, apart from building a foundation based on place-making solutions, campaigns to educate the community about flooding issues and problem-solving measures should be integrated into the overall strategy. The focus on a collaborative approach garnered support from local communities and helped to increase understanding of the principles behind interventions, leading to efficient implementation. The process also demonstrated how having clear channels of communication between stakeholders involved improved transparency and information sharing, resulting in the delivery of targeted, localised solutions. It also empowered local communities to build resilience over time, enhancing the effectiveness of local actions.

The success of the Hurricane Sandy Design Competition led RbD to replicate the model in other cities across the United States (US) to address other climate challenges, such as sea level rise in San Francisco. Outside of the US, the model has been implemented in Athens, Greece to plan and manage public green spaces in response to environmental challenges, as well as in Mexico City, Mexico, to address the urban, cultural and climate challenges facing the UNESCO neighbourhood of Xochimilco.

## Turning Threats and Weaknesses into Strengths and Opportunities

By using climate change as the premise of the study, it was necessary to contextualise the pilot study and test the proof-of-concept in a real-world site. The selected site needed to have had past exposure to extreme weather events.

Through working closely with agency stakeholders, the Cambridge Road neighbourhood was identified as a suitable pilot site due to its history of flash floods, diversity of residents and availability of spaces for interventions.

The Cambridge Road neighbourhood is a community with approximately 6,800 residents located on the fringe of Singapore’s central

business district. Cambridge Road itself bisects the neighbourhood and serves as the main thoroughfare for its residents, connecting the private housing to the public housing and the main community node—Pek Kio Market and Hawker Centre. Within the community node, a suite of community facilities and amenities such as a supermarket, an art gallery, independent businesses, playgrounds and fitness corners among others, serve a wide range of community needs. The neighbourhood is supported by various places of worship, a primary school and the Pek Kio Community Centre, which serves as a communal space for residents to engage in activities and build social capital.



Site plan of the Cambridge Road neighbourhood. Source: *CLC, Participate in Design*



The Cambridge Road neighbourhood.  
Source: CLC



The low-lying neighbourhood has been experiencing flooding since the 1960s. Efforts to enhance the drainage systems in the neighbourhood has significantly alleviated flooding issues. However, with increasingly irregular rainfall patterns and extreme weather events, its low-lying characteristics still make it prone to flash floods. This presented an opportunity to work with the residents to identify collective interventions to address these local issues, and tap on existing social networks to build up the community's capacity to deal with future challenges.

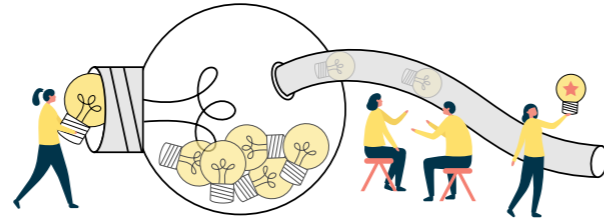
## Stakeholder Mapping

With the pilot site selected, an ecosystem of stakeholders to work with and support the community in community-led interventions was needed to address the local climate issues and build community resilience. Stakeholders were identified across various sectors and domains, and their complementary strengths and expertise to facilitate the various phases of the process determined.

Beyond residents, it was important to recognise other neighbourhood stakeholders, including local businesses, places of worship, the market association and educational institutions, who could also contribute to the community resilience-building process. These contributions could be through financial support, providing manpower or collaboration on community engagements and interventions. The involvement of these neighbourhood stakeholders allowed the leveraging of local knowledge and expertise, thereby reinforcing a sense of community and ownership.

# DESIGNING WITH PEOPLE

Partnering effectively with communities requires a deep understanding of the community and how interventions can best leverage local assets when ideating, prototyping or refining for further scaling.



## Ground Sensing: Connecting with the Local Community

Through the initial multi-stakeholder engagements, the CLC established a sandbox of possible interventions that could be implemented over different stages as supported by the ecosystem of stakeholders. While these possible interventions provided a broad understanding of some opportunities that existed, it was important to validate if the assumptions used to generate the interventions reflected reality and accurately depicted the sentiments in the neighbourhood. To determine this, the CLC conducted a combination of intercept surveys, walking conversations and focus group discussions.

The intercept surveys indicated a generally high level of friendliness amongst the community, with moderate social networks. On average, each resident had approximately 13 “hi-bye friends” connections and about 5 close neighbourhood friends. The surveys also indicated that most residents considered that high temperatures was a key impact of climate change affecting them, with only a small proportion citing that impacts from high rainfall would affect them.

The walking conversations and focus group discussions complemented these findings, and further provided an understanding of the residents’ living experiences in the neighbourhood, their perceptions and experience with extreme weather events, and opportune areas for interventions. There was generally a strong motivation among residents to help others and contribute towards the community. High trust and confidence in local government institutions in addressing local issues was also apparent. While residents understood the need for individual actions to address climate change, most lacked information on the types of actions they could take.

This reinforced the approach of leveraging the existing strong social networks into a collective response that can contribute towards building community resilience. Furthermore, it highlighted the informational and actionable gaps on climate issues that the community raised, which presented opportunities to harness it into the intention to act.



Intercept surveys

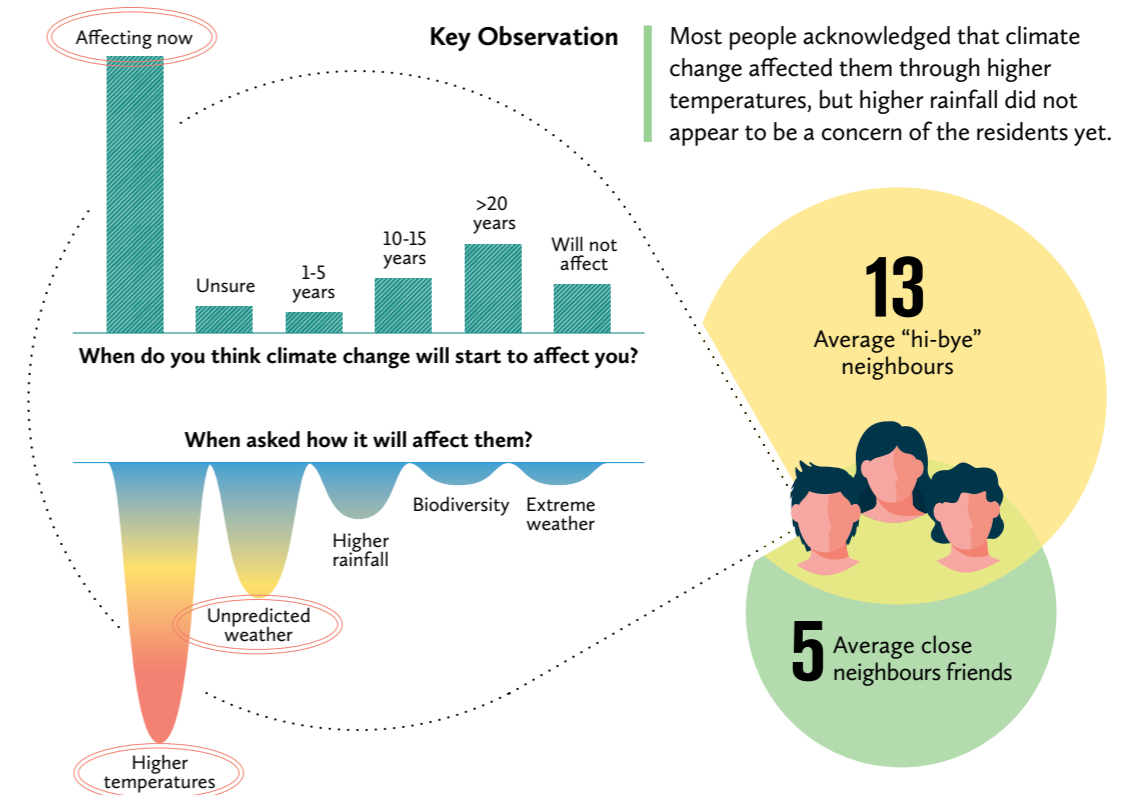


Walking conversations



Focus group discussions

See the Tool Tables in the Annex section (pages 84–87) for further details



In addition to the surveys, focus groups discussions, ethnographic observations, user counts and historical research were carried out to get a better understanding of the neighbourhood’s characteristics.

This provided insights into the existing community assets, key social nodes and high footfall areas which could be leveraged for climate change information and education. The ethnographic observations yielded the following findings:

Location	Observations
Public Housing	<ul style="list-style-type: none"> <li>Recreation amenities such as playgrounds, fitness corners and basketball courts were well utilised by various demographic groups.</li> <li>Unused void deck spaces presented opportunities for programming and infrastructural enhancements.</li> </ul>
Pek Kio Market & Food Centre	<ul style="list-style-type: none"> <li>Heavy circulation of residents and a transient population including staff from neighbouring medical institutions and office buildings.</li> <li>Frequent use of fitness and recreational spaces by seniors.</li> </ul>
Private Housing	<ul style="list-style-type: none"> <li>Green, open field (state land).</li> <li>Presence of a network of back alleys used by residents for growing plants, hanging laundry, and as short cuts.</li> <li>Limited use of back alleys as social spaces due to the perception that they were “owned” by residents.</li> <li>Roadside pavements were used for light recreational activities such as jogging.</li> </ul>





Pop-up booths

See the Tool Tables in the Annex section (page 88) for further details

# Crowdsourcing with the Community: Ideation and Planning

To co-develop the community's aspirations towards community resilience to climate change, pop-up booth sessions were organised to crowdsource ideas from the community.

To inspire the residents in this ideation process, the CLC showcased ongoing

infrastructural and community efforts in addressing climate change through pop-up booths. Residents valued the opportunity to broaden their understanding of community interventions that embodied traits of a resilient community, while appreciating the trade-offs they may have to make in view of limited space and resources.



Scan this QR code to see us in action or visit <https://www.youtube.com/watch?v=X4oNiRkvdSE>.

### Climate change may mean a wetter, warmer or drier Singapore.

### What can your neighbourhood do to be ready for this?

**Water Resources & Drainage**  
A persistent lack of rainfall or prolonged dry spell could place our water resources under pressure. Intense rainfall could overwhelm our drainage system and lead to flash floods.

**Public Health**  
Warmer periods can increase the risk of vector-borne diseases. Warmer weather may also lead to more occurrences of heat stress and heat-related illness, particularly among the very young, elderly and infirm. Greenhouse gases trap heat and increase temperatures by 1.4 to 4.8 degrees. Concrete surfaces trap heat as well. This could make walking uncomfortable.

**Food Security**  
As we import more than 90% of our food, we are vulnerable to fluctuations in global food supply which are affected by climate change.

**Biodiversity & Greenery**  
Changes to the climate, such as rising sea surface temperatures, rising sea levels and more intense rainfall, can adversely affect our flora and fauna.

**Coastal Protection**  
Areas along Singapore's coast are at risk of coastal inundation because about 30% of our island is less than 5m above mean sea level.

**How is Singapore preparing for climate change?**

**Keeping it Cool**  
With more than 50 years of greening, Singapore is today a biophilic City in a Garden with an interconnected network of nature reserves, parks, lush streetscapes, skyscraper greenery and park connectors. NParks is intensifying our tree planting and greening efforts to make living in urban environment more comfortable. NParks and URA also encourage new developments to feature greenery through their Skyrise Greenery Incentive Scheme and LUSH, respectively.

**Planning for Rainy Days**  
Since 2011, PUB has invested around \$1.8 billion on drainage improvement works. An additional \$400 million will be spent over the next two years to upgrade and maintain its drains. Drainage design standards have also been revised to prepare for more intense rain events.

**Flood Control**  
The Marina Barrage is part of a comprehensive flood control scheme to alleviate flooding in low-lying areas in the city by pumping excess stormwater into the sea.

**Logos:** Building & Construction Authority, Land Transport Authority, NParks, PUB, URA, Ministry of the Environment and Water Resources, MND, NUS, Singapore Environment Council, Singapore Green Building Council, Singapore Green Building Council, Singapore Green Building Council, Singapore Green Building Council.

### Impacts of Climate Change

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**Flood Control**  
The Marina Barrage is part of a comprehensive flood control scheme to alleviate flooding in low-lying areas in the city by pumping excess stormwater into the sea.

### Building Community Resilience

**What is this project about?**  
To partner communities, researchers and agencies in encouraging collective action and preparing for climate change. You will learn about climate change impacts and explore ways to co-create your ideas together.

**Coming soon to your neighbourhood**

- Pop-up Booths**  
For you to provide ideas and suggestions to improve the neighbourhood to prepare for climate change. Location and dates to be announced soon!
- Prototype Projects & Tactical Demonstrations**  
Full-day experiments on possible ideas. It will be available in the neighbourhood over a week for you to give feedback.
- Community Workshops**  
Design workshops for you to take part in participatory planning and budgeting.

**Tell us where to pop-up!**  
Mark it on the map!

### Share with us how you wish to combat climate change in your neighbourhood?

**Design Strategy #1 Community Gardening**  
Planting your own crops and plants in your neighbourhood to mitigate the urban heat island effect and create a greener neighbourhood.

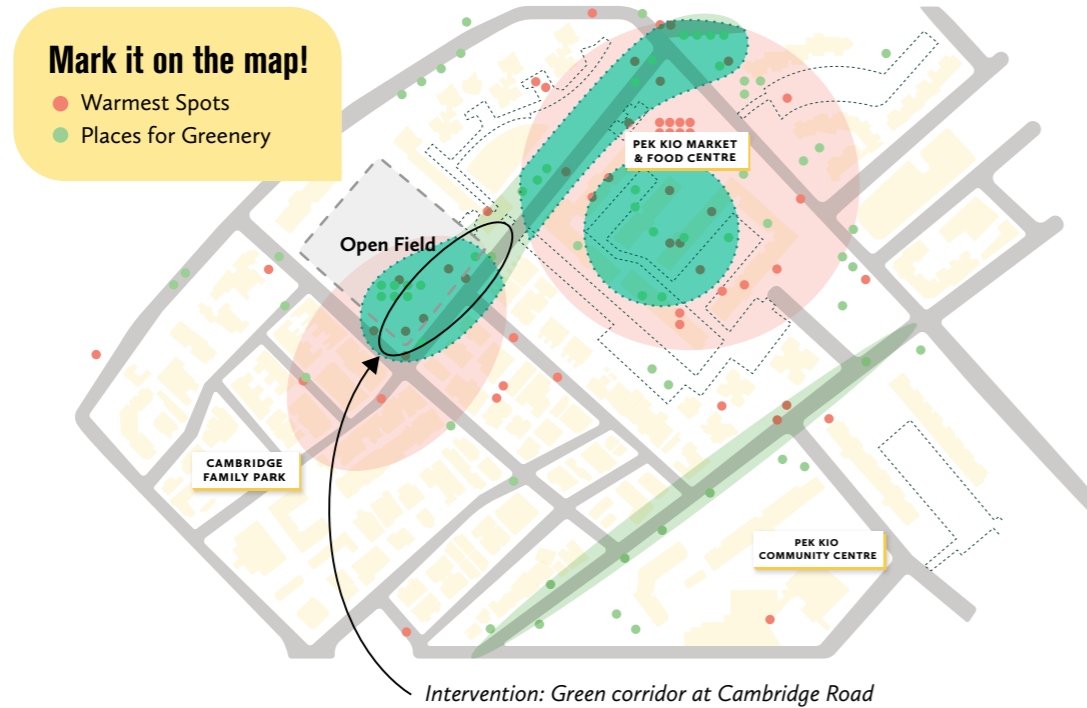
**Design Strategy #2 Activating Back Alleys**  
Decorate your backlanes with greenery, tables and chairs. Activate it so everyone in your neighbourhood can use them and greenery provide shade to bring down the heat within the neighbourhood.

**Design Strategy #3 Water Sensitive & Floodable Spaces**  
With projected increase in rainfall, how can open and green spaces around your neighbourhood be imagined to hold rainwater? For example, the Dutch have explored floodable squares called "water plazas" to temporarily hold rainwater.

**Qualities of a Resilient & Livable Cambridge Road Neighbourhood:**  
Cooler Environment, Carbon Footprint Reduction, Sponges for Water, Quality of Living, Community Spirit.

Informational panels displayed at the pop-up booths showcased ongoing community efforts to inspire residents to contribute their ideas on ways to collectively address climate challenges in the neighbourhood. Source: CLC

The community rallied to identify possible areas in their neighbourhood for climate-response interventions.  
Source: CLC, Participate in Design



Through these interactions, residents were able to appreciate the spectrum of possibilities and provide feedback on how it could be incorporated into their local neighbourhood. Residents were more open to the idea of testing out community projects when they better understood how local efforts could contribute to addressing climate change. Addressing the knowledge gap on what was actionable was key in motivating the community to pitch in.

In addition, the residents identified key areas in the neighbourhood that they prioritised for localised interventions to address issues such as heat and rainwater accumulation based on their experience. This further provided a gauge of the residents' receptivity to future engagements and collaboration for community interventions.

At the same time, the community ideation process distilled five broad recommendations to guide strategies in developing the community interventions:

- 1 Start small and build upon existing infrastructure and community initiatives to test climate-resilient ideas.
- 2 Leverage the social network and familiar spaces within the neighbourhood for community interventions.
- 3 Test out new ideas with tangible outcomes to demonstrate which targets are more immediately feasible than others in order to manage expectations.
- 4 Combine ideas and elements to develop multi-functional interventions that can address multiple issues.
- 5 Utilise community interventions to kick-start mindset changes and encourage greater community actions.

To kickstart the development of interventions, partnerships were established with interested residents and volunteers who were keen to participate in the co-creation journey. The local People's Association office and Grassroots Advisor were instrumental in conducting outreach through door-to-door surveys and house visits, to identify passionate and like-minded residents. The CLC drew upon information gathered in past engagements to reach out to community members who had previously indicated interest in further involvement.

Through these efforts, 30 individuals stepped forward as community champions and collaborated with the CLC and other stakeholders throughout the duration of the project. These community champions consisted of residents from both the public and private housing estates in the Cambridge Road neighbourhood, residents from the wider Moulmein-Cairnhill constituency, and individuals who had an affiliation with the neighbourhood either through the places of worship, volunteerism or as past residents.

To reaffirm their commitment for the collective cause and develop a sense of identity, they formed a volunteer-based group—with the support of the local advisor—called Our Green MoCa - Moulmein-Cairnhill to lead the community interventions.

As it was impractical and resource-intensive to involve all residents through the entire project, these community champions served as key touchpoints for the community. They played a catalytic role in the project as they championed the cause and mobilised residents to participate in the activities, ultimately spreading climate awareness and action through the neighbourhood. At the same time, the peer-to-peer interactions helped to build social capital within the community that would be critical for collective community actions.



The birth of Our Green MoCa began from these initial discussions on the interventions that they were keen to develop.  
Source: CLC

The community champions prioritised three community interventions as initial projects. *Source: CLC*



With an understanding of available resources, the community champions identified and prioritised three community interventions that they were keen to work on as initial projects. These interventions were prioritised to provide different avenues of interaction and climate actions based on interests and anticipated value:

Community-greening initiative: to enhance green cover and natural spaces within the neighbourhood.

Activation of social spaces in underused areas: to create areas that promote community interactions and bonding, and greater care for environmental and climate causes.

Community-led climate conversations: to increase knowledge on climate issues, risks and actions.

## Building Capacity and Confidence Through Resource Sessions

While the community champions were enthusiastic and committed to action, they expressed doubt if they could do a “good enough” job as they felt that they lacked the technical skills to engage their community as well as plan, design and implement the community projects. To support them in the co-creation process, the CLC worked with agencies and experts to facilitate the building of skills, confidence, and ideas.

One of these sessions was an online train-the-trainers masterclass by Participate in Design, which focused on community engagement and design thinking. Through the session, the community champions gained an understanding of engagement strategies that supported them in the planning and designing of community interventions.



A train-the-trainer masterclass was organised to build the community's capacity for engagement and design-thinking approaches to support community interventions. *Source: CLC*



The community champions led discussions with the wider community during the live sketching workshop to develop ideas for potential intervention. *Source: CLC*

The NParks supported by educating the community on gardening and maintenance, in preparation for community intervention development. Source: CLC



The community champions were able to put the newly-acquired community engagement skills to practice as they worked with CLC Visiting Fellow and landscape architect, Herbert Dreiseitl, who conducted a virtual live-sketching workshop for the community. The workshop helped these champions engage the wider community on the use of landscape design in conceptualising their community projects.

For projects that required specific knowledge expertise, the community champions sought the CLC's support in connecting them with government agencies, to bridge any knowledge and information gaps. For example, the National Parks Board (NParks) organised workshops for the community champions to learn more about maintaining greenery and provided additional support in the form of design toolkits as well as weekly consultations to address concerns around plant selection and site constraints. These were critical in nurturing a sense of purpose and an appreciation of their roles in the larger plans, such as with the national visions of climate resilience and City in Nature.

“ I felt like he [Herbert Dreiseitl] was guiding us and... wasn't like, “oh I'm the expert I know how these things work and this is how we should do it”. Instead, it was more like “what do you all want to see”, and then guiding us on what can turn into reality.”

— Our Green MoCa Community Champion

Community champions worked with artists from the local art gallery on possible design ideas for the mural paintings as part of the social space activation project. Source: CLC

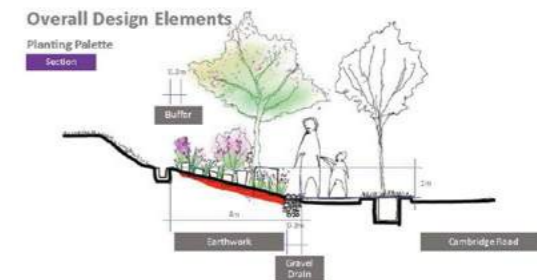


Knowledge and expertise gained from the resource sessions guided the community champions in developing and refining their design concepts for the community interventions. Factors such as the need to enhance thermal comfort and ease of maintenance were discussed during the refinement of design concepts for the community-greening initiatives.

The community champions were also keen to amalgamate local identity, environmental consciousness and sustainability through mural paintings under the social space activation project. This was further supported by collaborating with an art gallery in the neighbourhood, to provide design expertise and direction.



The community champions exercised their creativity and newly acquired knowledge and technical considerations to develop this initial design concept for the community-greening initiative. Source: Our Green MoCa



Landscape architects from NParks built upon the community's design concept and guided the community champions to refine the plan to better suit ground conditions and maintenance considerations. Source: NParks



Prototyping

See the Tool Tables in the Annex section (page 89) for further details

“ I have a better understanding of how community work is performed...so whenever we have some improvement [project,] whether it was hosting a webinar or such as the recent ‘tingkat’ giveaway, I think when people see something being done, it really spurs us on to do more.”

— Our Green MoCa Community Champion

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Climate conversations brought greater knowledge and awareness to the community on the actions they can take to address climate change. Source: CLC, Our Green MoCa

### Bringing it to Life: Demonstrations and Tactical Interventions

Collaborating with an ecosystem of stakeholders on the design provided both the community and private entities with a greater stake and sense of ownership in the local neighbourhood. Such collaboration fostered greater community engagement and identified possible interventions. As part of the social space activation project, the community champions partnered with the local art gallery and students from local schools and institutes of higher learning, to design a series of community art murals. Residents were engaged to share their views and images which they associated with environmental consciousness, sustainability, and local heritage. The implementation saw several artists and volunteers come together to paint and bring the mural to life. This illustrated the positive knock-on effects that the resilience process had on a community's social fabric and capacity for local action.

As part of the community-greening initiative, the community champions rallied community members of all ages—including students from the neighbouring school—to assist with the planting and landscaping efforts. This created opportunities for residents and volunteers to come together, build bonds and bridge social ties with one another. To foster greater knowledge sharing and raise awareness on the actions individuals can take, the community conducted a webinar series covering topics related to climate change and environmental sustainability. This laid the foundation for increased focus on sustainability issues and cultivation of environmentally-conscious behaviours for the community's other projects.



Mural paintings spread climate change awareness and enliven unused spaces to support the building of social capital. Source: CLC and Our Green MoCa



<https://go.gov.sg/tactical-projects>

Scan this QR code to see us in action or visit <https://www.youtube.com/watch?v=PLTwN6mchU>.

The implementation of the greening initiative was a community affair and provided opportunities for social ties to be built and enhanced. *Source: CLC*



Community workshops

See the Tool Tables in the Annex section (page 90) for further details

## Empowering Communities to Sustain and Own Interventions: Community Climate Action Plan



**We experienced a two-way learning process while co-planning, co-designing, and co-creating this space with the community members, whether it was on selection of plant types that can provide shade and enhance biodiversity, or guidance on maintenance after planting. This project highlighted how working together with the community while providing hands-on guidance can lead to practical nature-based solutions.”**

— NParks

Building resilient communities involves extending the participatory process beyond co-building and into empowering the community in order to sustain these interventions. As facilitators of the process, the CLC supported the community in establishing a maintenance system and further encouraged the strong sense of ownership that had been burgeoning throughout the duration of the project.

The implementation of a maintenance plan ensured the community’s greening initiative efforts were sustainable. The CLC facilitated the community discussions and connected community champions with agencies and relevant experts who could provide further expertise and support in devising such a plan. The community champions eventually established a maintenance roster, demonstrating their ability to self-organise and be resourceful in sustaining their own ideas.

Beyond simply sustaining what had been done, the community champions also initiated discussions with other residents to think longer term and start identifying the next batch of projects to develop. This was done through several community workshops to gather feedback from the implemented projects, and to seek new ideas that they could work on together, as a community. The outcome was a Community Climate Action Plan consisting of place-based, infrastructure-related projects, and programmes and campaigns, that the community champions plan to implement in the short- to medium-term.

To date, the community champions have already organised several new programmes and campaigns, such as an environmental

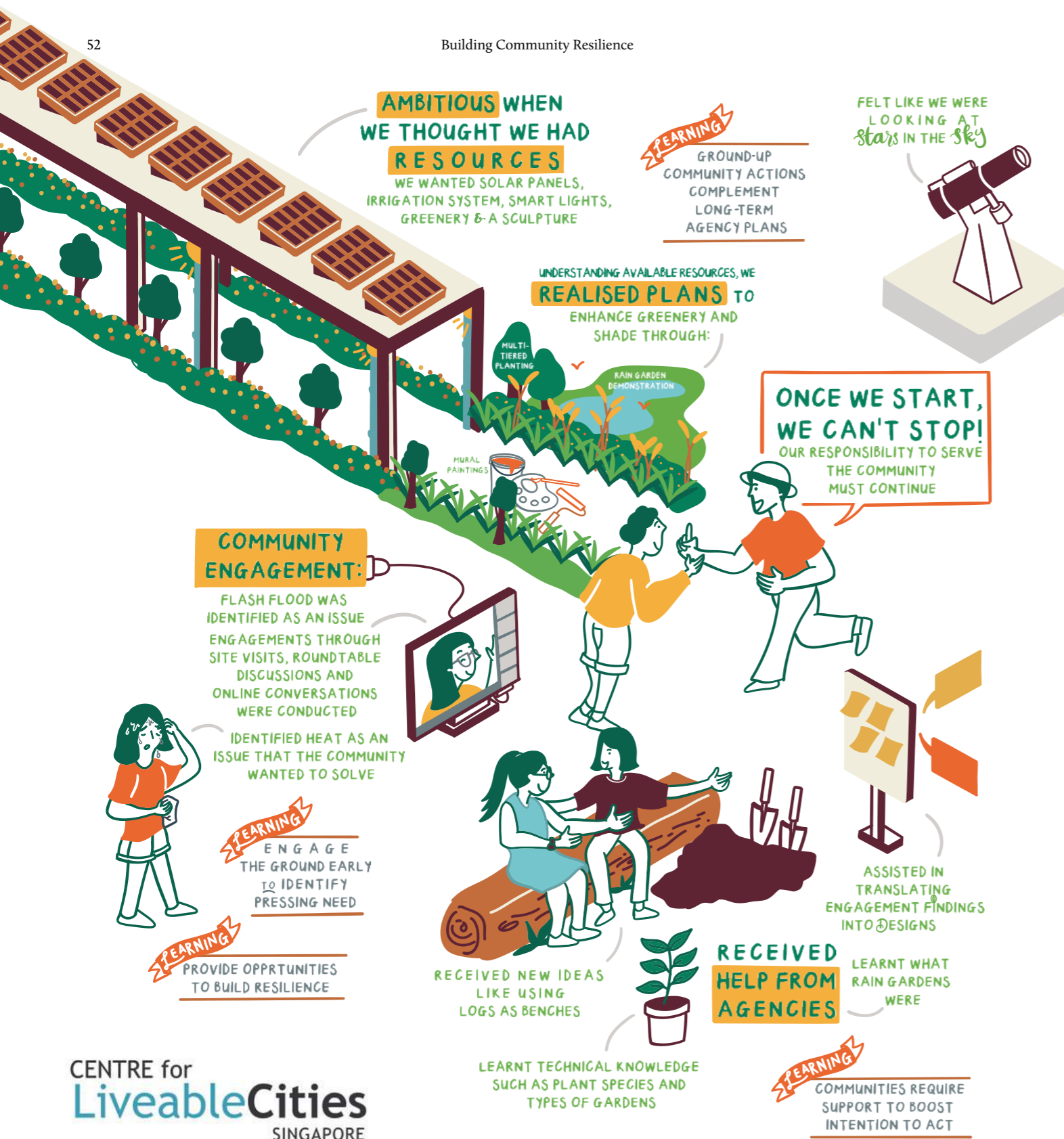
hackathon and a “bring-your-own” community challenge campaign to further create the momentum throughout the neighbourhood. They have applied the lessons and capabilities learnt through this resilience-building journey by actively crowdsourcing for funding and manpower support, and conducting their own community engagement activities to actualise new projects. Since August 2021, as the CLC eased off involvement, new projects continued to appear in the community’s pipeline, such as the expansion of the greening initiative into a therapeutic and edible garden, and the establishment of campaigns promoting recycling and circularity. These two projects have been awarded government agencies’ funding to support their implementation. The CLC sees this as an indication of a healthy build-up of adaptive capacity in problem-solving

and a step in the right direction to achieving self-mobilisation for the community.

Beyond community projects, peer-to-peer sharing and collaborations between communities can go a long way in nurturing new community champions, who can in turn support the group in future projects. This has the potential to catalyse similar efforts by communities in other neighbourhoods. For example, the community champions launched a Green Hub in the neighbourhood to continue to raise awareness on climate issues, engender changes in attitudes and behaviours, and to encourage working as a community on future projects. Ultimately, the application of their new capabilities can increase the longevity of their initial efforts, and potentially scale-up the resilience-building process across the city.



The Community Climate Action Plan reflects the healthy pipeline of grounds-up projects by the community, a step in the right direction towards achieving self-mobilisation, sustained commitment and resilience (as of June 2022). Source: CLC



# BUILDING COMMUNITY RESILIENCE AT CAMBRIDGE ROAD



**CHALLENGE: SUSTAINING ENGAGEMENT OF VOLUNTEERS**

**WE TRY TO INSPIRE RESIDENTS TO BE INVOLVED AND BUILD RELATIONSHIPS WITH GOVERNMENT AGENCIES**



**RESEARCH HIGHLIGHTS ON SOCIAL NETWORKS**



THE WORLD IS SMALL IN SOCIAL DIMENSIONS AS SEEN THROUGH GRAPH THEORY & SIX DEGREES OF SEPARATION  
THREE MODELS OF NETWORKS: RANDOM, SCALE FREE & SOCIAL NETWORKS

COMMUNITIES THAT ARE MORE OPEN IN MEETING NEW PEOPLE OR HAVE MORE STABLE RELATIONSHIPS RECOVER FASTER FROM LOCKDOWNS

A summary of the resilience-building journey and reflection of possible next steps.  
Source: CLC





**Corinne Ong**  
Senior Research Fellow, Institute of Water Policy,  
Lee Kuan Yew School of Public Policy

## OPINION

# UNCOVERING COMMUNITY ASSETS FOR CLIMATE CHANGE

The risk of climate change is real. But how do we ensure that everyone understands its risks, contributes to its mitigation, and learns to adapt effectively? How do we “do” climate change adaptation and mitigation with residents at a collective level? After all, worldwide examples tell us that communities have so much to offer when people address climate risk collaboratively.

My participation in this project with the Cambridge Road community residents shed light on my questions as a researcher. In this little, yet vibrant and diverse community, people made time to talk to us about climate change and its risks—their experiences, fears, doubts, and concerns. Although climate change was “felt” and many knew what it was about, residents also felt helpless about how they could address an issue that is pervasive, yet complex and perceivably distant.

Despite this, many whom we spoke with were already taking great strides to take actions on climate mitigation by actively recycling, reducing resource wastage, or even teaching others to do so—among other actions. Local residents and community leaders shared in focus group discussions with us that they wanted to know what else they could do to make a difference to this unwieldy problem of climate change. Such was the spirit and potential of residents and volunteers in the Cambridge Road neighbourhood that proved so heart-warming to me as an academic, who believes in the “capital” that residential communities can mobilise. This capital lies in the power of collectives who share common values and causes, and



Community members of Cambridge Road working on the greening initiative as a climate intervention.  
Source: CLC

influence one another to create change, such as developing impactful norms that promote members’ responsiveness to climate risk.

With its stronghold of passionate, long-time residents and robust grassroot groups, the Cambridge Road community exemplifies for communities across Singapore how they too can begin this process of collaboration to proactively address climate risks. Just as critically, communities driven to action need opportunities to engage with climate experts, partner with government agencies that are familiar with and directly manage climate risks, and other organisations, to secure resource support and appropriate guidance. Finally, our youths of today who will witness the effects of climate change more profoundly in the future, need to be mobilised early on in community-led engagements. They should be able to do so in the comfort of their communities and be able to seek counsel from veteran community leaders. I look forward to the Cambridge Road community, with all of its highly capable leaders and residents, leading the charge in developing communities that embrace climate action!

**With its stronghold of passionate, long-time residents and robust grassroot groups, the Cambridge Road community exemplifies for communities across Singapore how they too can begin this process of collaboration to proactively address climate risks.**



Surveying community members at critical milestones of the process provided opportunities to evaluate progress overtime. *Source: CLC*

## Chapter 4

# MEASURING COMMUNITY RESILIENCE

The study of Cambridge Road was more than just about encouraging local interventions to build up community resilience to climate challenges. It was also an attempt to give form to the nebulous idea of community resilience so that there was an objective mechanism to measure and monitor improvements.

Chapter 2 outlined the indicators that formed the underlying foundation of this measurement tool, which was then piloted alongside the participatory design and engagement process that was undertaken with the community at Cambridge Road in Chapter 3. This enabled the state of community resilience to be quantified and provided further insights into how community resilience could be developed.

# TOOLS IN ACTION

## Methodology

A mixed method approach was devised to obtain a comprehensive understanding of the state of resilience in the community.



The community resilience indicators were measured through a set of survey questions, developed together with our knowledge partners. Source: CLC

Quantitative surveys that mapped directly to the community resilience indicators were developed, providing us with the breadth of data needed to quantify and measure the level of community resilience at any one point in time, and its evolution over time. While it was not possible to pinpoint and explain fluctuations as a result of a specific intervention, shock and/or stressor, the surveys did provide for periodic tracking of capacities that mattered, and offered snapshots of the community's progress towards greater resiliency.

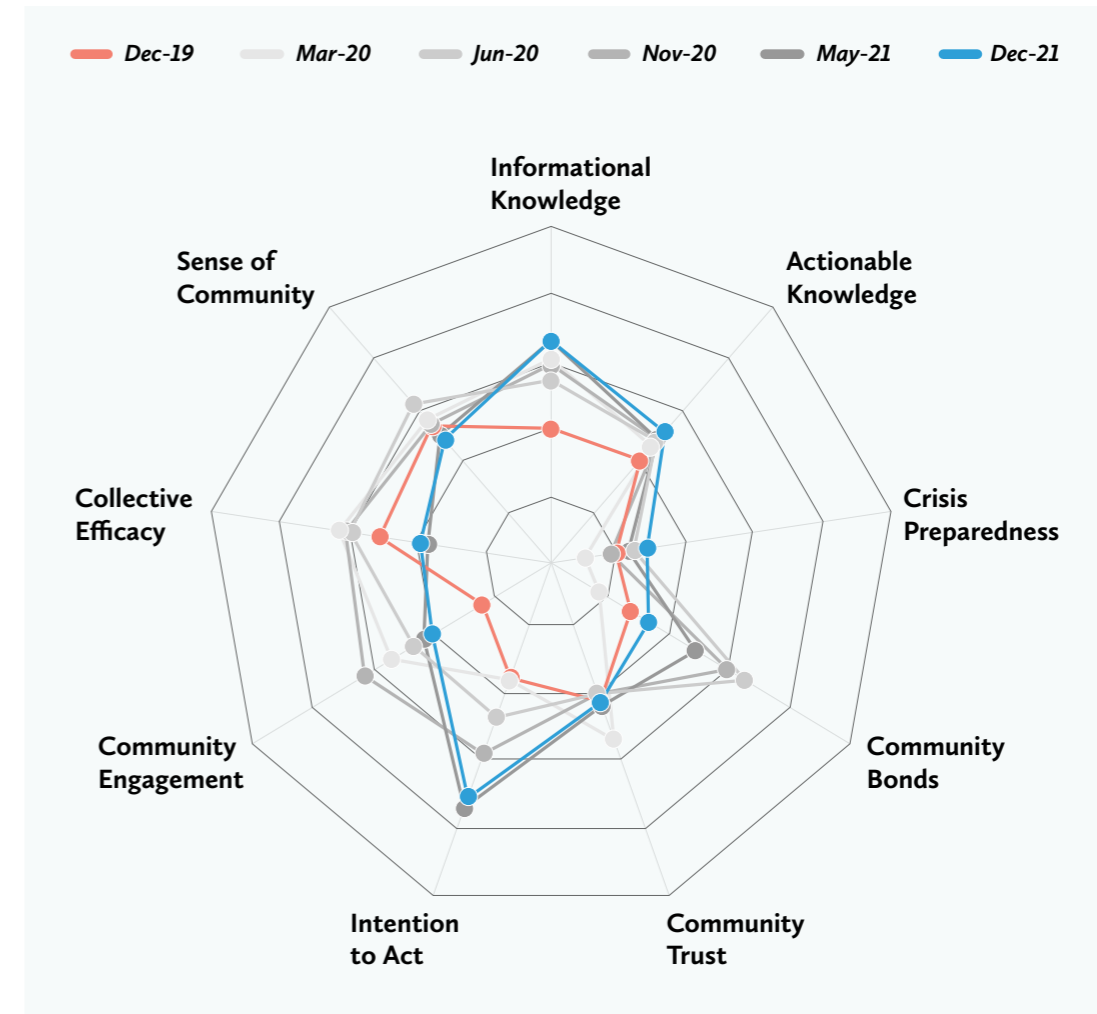
These surveys were then complemented with ethnographic observations made during community engagements and interviews to provide qualitative depth for a comprehensive understanding of the community. Hence, while the indicators provided an overview of community resilience, some elements of social capital and connections were better discerned through conversations and non-verbal cues, to reveal the dynamics between community members.

## Quantitative and Qualitative Results

Data collected through the surveys highlighted how the participatory design and engagement process had contributed to an increase of community resilience over time. This suggests the effectiveness of close engagements and community actions in driving collective interventions and in building up knowledge and social ties in the process.

It was also observed that certain indicators seemed more sensitive to the changes influenced by the participatory design and engagement process, interventions, and external events than others.

For example, indicators relating to knowledge showed a positive change in the community,



Changes in the indicator values across the duration of the pilot project. Source: CLC

which could be attributed to the resource sessions by agencies and experts to impart information. The series of community-led climate conversations also deepened awareness of the issues discussed. Improvements in knowledge coincided with a noticeable increase in the community's intention to act. A deliberate effort was made to break down concepts and issues to manageable portions, which facilitated the creation of tangible actions to generate impact on the ground. The community champions shared through interviews with the Centre for Liveable Cities (CLC) that they felt these resource

sessions were instrumental in increasing their knowledge and engendered a change in beliefs that helped influence collective actions.

The process of bringing various stakeholders together to ideate, plan and implement interventions contributed to uplifting community engagements, in particular their sense of participation, collaboration, and empowerment. This concurred with findings from interviews which concluded that the community-driven nature of the project was a key success factor.

“

I have been more watchful of my own behaviour...so being part of the community definitely changed my perspective, my own behaviour and people around me. And it spurred me to set up some efforts in [my own organisation] as well.”

— Our Green MoCa Community Champion

At the same time, trust between communities and their sense of community remained relatively stable and high throughout the course of the participatory design and engagement process. This reflects the positive environment created by the current physical and social infrastructure which has fostered trust, and facilitates a design and engagement process that is ongoing and participatory.

Although much of the process took place during the height of the COVID-19 pandemic, limiting face-to-face interactions, the community champions nonetheless ensured community cohesion by adapting alternative means of communication such as online calls and discussions. Despite the challenges, the bonds

“

I think a portion of the [community] champions...want to see the change for our children also, for our future generations and how we can actually make [the community] a better place to stay in, especially when this area has a lot of potential.”

— Our Green MoCa Community Champion

between community champions clearly grew closer while new bonds with other residents and volunteers were established.

While there had been enthusiasm in collective solutioning, there were occasional periods where the community champions felt demoralised or uncertain. For example, in the post-implementation phase of the community-greening initiative, the community champions were overwhelmed by an issue regarding weeding the green areas, which impacted team dynamics and morale. But advice from the National Parks Board (NParks) and experts helped devise a suitable maintenance roster to restore the community's confidence.

## KEY INSIGHTS

This pilot project has demonstrated to the CLC that it is possible to measure and thus track the state of community resilience. It also showed that it was possible to have an impact on community resilience through a participatory process that is intentionally designed to create conditions

and opportunities where the community could build up its social capital, resilience capacities, and capabilities.

Here are the key insights that we have discovered about building community resilience by design.



A young participant sharing her thoughts about climate change during a community engagement. Source: CLC

## Key Insight 1: The Community Knows Best

Early ground engagements are key to identifying a community's needs and concerns. While flooding was identified as a key issue when selecting Cambridge Road as the project site, early engagements revealed that the community considered heat as a more pressing issue. Engagement strategies were therefore pivoted to work with the community and stakeholders to develop the community-greening initiative as a climate-response intervention, with the community stepping up to take ownership of the long-term maintenance.

This experience demonstrated that harnessing the input from community members can help to prioritise localised interventions and responses to a particular shock or stressor. It creates room for context-specific projects that go beyond conventional approaches of problem solving, and ultimately leads to better resource allocation. More importantly, this builds up community involvement and their sense of ownership, thus contributing to resilience-building.

“

**In most community activities, you just sit and watch, and others are just listening in. So it took a while for them to get used to having to speak up, to get used to the idea that their opinion mattered.”**

— *Our Green MoCa Community Champion*



Residents shared their lived experiences with community facilitators during the initial ground sensing. Source: CLC

## Key Insight 2: Building Infrastructure Can Also Build Community Resilience

Community engagements to improve the environment can provide opportunities to build resilience. Participatory planning and engagement processes can empower community members and are thus effective platforms for building community resilience. For example, during workshops for the community-greening initiative, the community was not only contributing to addressing the issues regarding heat but were also cultivating social ties among residents who shared a passion and concern. Resource sessions and consultations also facilitated the cultivation of linking social ties between the community and those in authority, i.e., government agencies and experts.

This presents a case for neighbourhood enhancement projects to adopt a multi-pronged participatory strategy that involves collaborating with people on the ground to ideate and implement interventions that can encourage communities to have a greater stake in their shared future. This would not only complement the government's efforts but could contribute to building community resilience.

“

**[The] underlying spirit of working towards a common goal, a common cause—that's what bonds everyone regardless of personalities, tendencies and cultures.”**

— *Our Green MoCa Community Champion*

## Key Insight 3: Knowledge Builds Confidence and Empowerment

There is great value in providing communities with resource sessions through a network of agencies, experts and partners, to support communities. This not only enables collective solutioning by communities but also builds up confidence in their own ability to contribute, while simultaneously gaining renewed appreciation of the agencies' work.

Beyond resource sessions, agencies and experts can also play an active role in facilitating community-led interventions through approval processes and technical requirements, given the communities' strong desire and demonstrated ability to work in a cross-sector manner.



**This was the first time I was able to design, and... rally the whole community together to see the usefulness of this project and get them to start thinking about climate change.”**

— *Our Green MoCa Community Champion*



NParks officers guiding the community champions during the implementation of the greening initiative.  
Source: *Our Green MoCa*

## Key Insight 4: Connect National Goals with Community Aspirations

A valuable outcome of close engagements is the opportunity to ultimately be able to connect the community's aspirations with high-level, national goals, allowing community members to appreciate their value and contribution across scales. Community-based action plans help to break down or re-frame complex issues

into digestible and contextual plans for communities and neighbourhoods. This makes such plans more relatable and relevant, and develops community efficacy for long term sustainability and resilience. The process taken also helps to reduce barriers to community-led action and provides effective support through a multi-stakeholder approach.



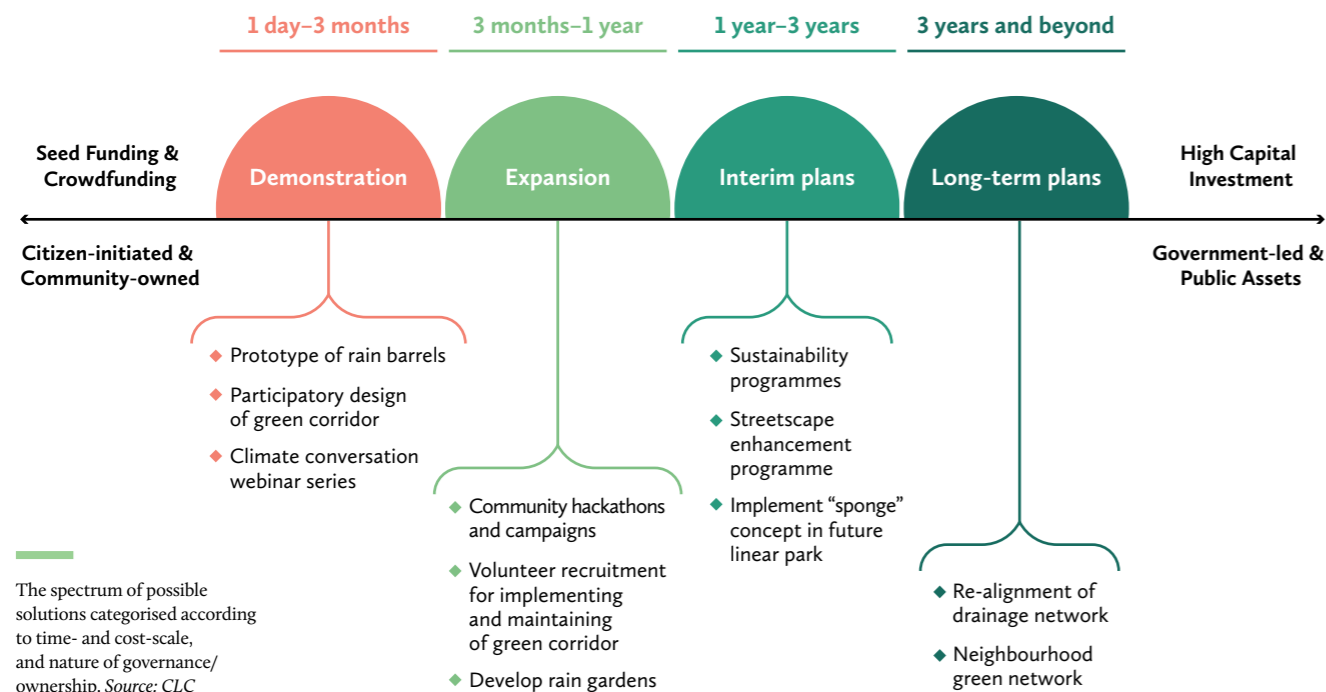
**The process also emphasised the importance of linking government to the community in every stage of public projects. We believed that the collaboration would enhance the community's outlook towards community-initiated nature-based solutions to mitigate climate-change effects and foster their ownership of public green spaces. The integrated process of co-creating an ecological and climate-resilient city will also lead to greater social resiliency and truly make Singapore a City in Nature.”**

— *NParks*

## Key Insight 5: Community Actions Complement National Plans

Community-initiated interventions have been embraced as small wins that have the potential to expand and complement the work of agencies who are planning at a national scale with long-term needs in mind. The process demonstrated the importance of leveraging the community to jointly create ideas and initiatives across scales and timeframes, to build resilience over time.

Community-led initiatives can range from small-scale, low-cost prototypes, such as demonstration projects or mural paintings, to medium-term interventions like webinars and green corridors with greater funding support, ultimately complementing longer-term, capital-intensive projects led by government agencies. This sets out a series of stepping stones, which would incrementally increase a community's—and eventually a city's—adaptive capacity for the future.



## Key Insight 6: Community Resilience Indicators Have Wide Application Potential

This proof of concept to measure community resilience opens the possibility of integrating resilience efforts across domains and sectors. There is potential for the community resilience indicators to provide useful performance data which can aid in assessing the effectiveness of community engagement across programmes and projects. As a consistent

set of indicators for both local communities and government agencies, they can also help to better align and thus calibrate strategies and engagement approaches across time and groups. At the same time, these indicators offer a foundation for more targeted methods and approaches to be developed, such as specific projects intended to build certain capacities.



The community resilience indicators provides an understanding of the outcome of community engagement and participatory design on social relations and connections within the community. Source: CLC



**Olivia Jensen**

Lead Scientist, Lloyd's Register Foundation  
Institute for the Public Understanding of Risk,  
National University of Singapore

## OPINION

# EMPOWERING COMMUNITIES TO BE RESILIENT WITH INFORMATION

When we think about communicating climate risks, the first images which come to mind are often melting glaciers and stranded polar bears: dramatic but distant, especially for the citizens of a highly developed tropical city. Climate communicators have therefore sought different ways to bring climate change “closer to home” for Singaporeans. Government agencies and local media have developed striking visualisations showing floodwaters inundating downtown landmarks and huge waves crashing over the popular recreational area of East Coast Park.<sup>13</sup>

In a sense, this type of communication has been very successful. In our first interactions with residents of Cambridge Road through small group discussions in the community centre and walking around the neighbourhood together, it was clear that people were very familiar with the basic causes of climate change and the expected effects on extreme rainfall and temperature. There were no hints of climate scepticism. Residents had also thought about many of the potential indirect impacts, from the health of the elderly to the prices of food imports.

However, the conversations also revealed an important gap—what ordinary members of the public should do about it. Initially, residents turned the question back to the experts. One of the participants asked: “We are all on standby, we are all eager to contribute as long as you give us a direction—what should we do?”

This response is not surprising. Government agencies in Singapore have invested heavily in infrastructure to

reduce climate-related risks. Cambridge Road is an excellent example of this. The area used to be a flooding hotspot; an old flood gauge stands on one of the main road intersections. During one of the walking conversations, a long-time resident explained the purpose of the flood gauge to newer community members. The others had no direct experience of floods themselves as investment in drainage infrastructure had contributed to a flood-free neighbourhood in the last five years.

The effectiveness of public risk management has led to what we can call a “caretaker effect”. Citizens have a high level of confidence in the government to take adequate action to protect Singapore from climate change, and therefore turn to the public authorities for guidance rather than taking action themselves.

One of the aims of the Cambridge Road project was to turn around this pattern of one-way communication and, for those who usually take the role of imparting advice, to instead listen to community members and support them in defining and implementing their own interventions. Members of the public have knowledge that technical experts usually lack, about the local values, priorities, trade-offs and

constraints of everyday life in a specific place. This knowledge is essential to meaningful and lasting efforts to build resilience—yet, can be neglected when the focus is placed on the technical design of interventions.

The second channel of communication at the heart of local resilience-building is between community members themselves. The Cambridge Road focus group discussions revealed high levels of “social capital”, a concept which captures the degree of interconnectedness between individuals and groups, already present in the community, centred around highly committed individuals. These people became the project’s champions, using their existing networks to reach out further to establish and run the “Our Green MoCa” group. Climate issues proved a natural basis for inclusive engagement because of their broad-ranging impacts. Even more striking were the bonds that formed between the champions themselves in their determination to take the projects forward through the COVID-19 pandemic and other challenges. These bonds are an important indication of community resilience in Cambridge Road and a powerful experience for the champions to share with other communities.

**The effectiveness of public risk management has led to what we can call a “caretaker effect”. Citizens have a high level of confidence in the government to take adequate action to protect Singapore from climate change, and therefore turn to the public authorities for guidance rather than taking action themselves.**





#### Winston Chow

Associate Professor of Science, Technology and Society, School of Social Sciences and Office of Core Curriculum, Singapore Management University

## OPINION

# THE ROLE OF CITIZEN SCIENCE AND ENGAGEMENT IN DRIVING COMMUNITY CLIMATE ACTION TOWARDS CLIMATE-RESILIENT DEVELOPMENT

Can something as “simple” as measuring the ambient environment of one’s neighbourhood result in enhanced climate resilience in a community? It does, and more so than you may think.

In the recent Intergovernmental Panel on Climate Change (IPCC) [6<sup>th</sup> Assessment report on climate impacts, adaptation and vulnerability](#), the issue of enhancing “climate resilient development” was a key conclusion in reducing direct climate harm done onto communities.

It can be [briefly defined](#) as “reducing exposure and vulnerability to climate hazards, cutting back greenhouse gas emissions and conserving biodiversity (as) highest priorities in everyday decision-making and policies on all aspects of society”.

Such an ambitious developmental vision requires involvement from as many people as possible across all aspects of society. Effective climate resilience occurs not only with top-down government policies, but when strong and long-lasting partnerships occur across all stakeholders in society.

Indeed, the IPCC concluded with very high confidence that civic engagement is an important element of building societal consensus and reducing barriers to action on adaptation, mitigation, and sustainable development—the key ingredients for climate resilience.

This ideal level of civic engagement does not happen overnight; there is much evidence indicating that it requires individual stakeholder buy-in and involvement for tangible outcomes to happen.

One potential approach is involving individuals in [citizen science projects](#), in which knowledge is co-created from the ground-up between academics and the public through the formal practice of science.

This can occur in several ways—such as developing a sensor network with curious and interested residents that provides current or real-time climate data on their immediate environment in the community.

The practice of residents translating sensor data (e.g., “the park space is 2°C cooler than the pavement tonight!”) into information (e.g., “green spaces can help to reduce heat risks in my neighbourhood”) potentially reinforces the appreciation and understanding of scientific information—in this example, the understanding of urban heat islands—in a more intimate and arguably effective manner than merely reading scientific literature.

This small and “simple” step, I argue, enables conditions in which personal engagement through “learning by doing” in community citizen science projects can lead to higher involvement in and engagement with issues related to climate change, regardless of educational level or age.

Of course, this small citizen science project alone would not amount to much without being integrated in a larger community-wide project that can help further translate the curiosity and involvement of stakeholders towards engagement with other parties. This moves away from a one-way rhetoric on climate adaptation to meaningful dialogue and action. (see Dr Jensen’s article).

Closing the gap in climate action gives agency to enhancing overall urban sustainability and developing climate resilience—an important vision and outcome of the Singapore Green Plan 2030.



Installation of environmental sensors at Cambridge Road to measure how vegetation reduces heat exposure through shading and evaporative cooling. Source: Winston Chow

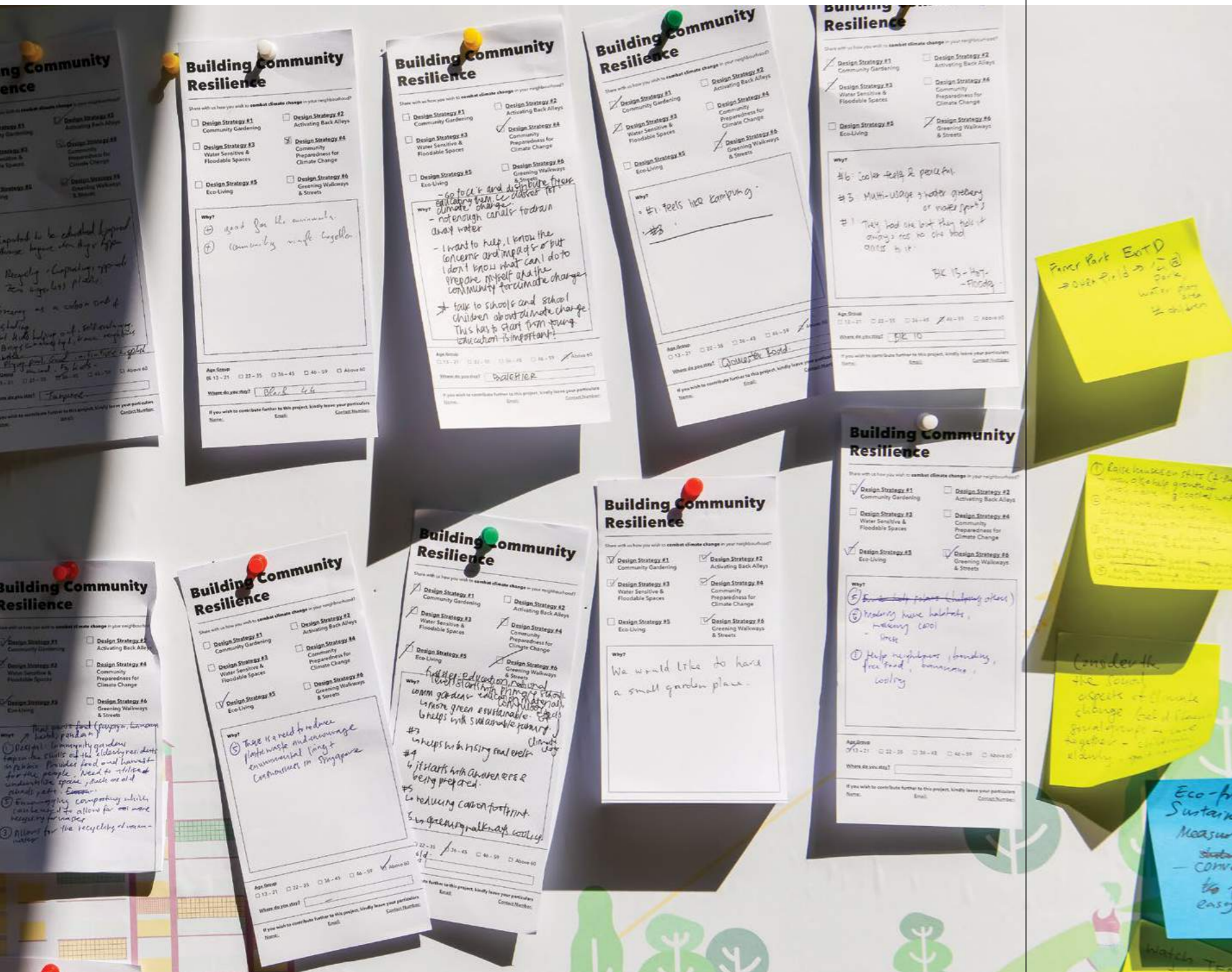


Public survey engagement of residents of Cambridge Road on climate resilience. Source: Winston Chow



The open field adjacent to the Cambridge Road public housing estate. Source: Winston Chow

**The IPCC concluded with very high confidence that civic engagement is an important element of building societal consensus and reducing barriers to action on adaptation, mitigation, and sustainable development—the key ingredients for climate resilience.**



## Chapter 5

# BUILDING COMMUNITY RESILIENCE

Inputs from the community were key to involve them as stakeholders and establish partnerships through the process. Source: CLC

## AN ONGOING EFFORT

In February 2022, the Intergovernmental Panel on Climate Change (IPCC) put the future in stark terms: global warming, reaching 1.5°C in the near-term, would cause unavoidable increases in multiple climate hazards and present multiple risks to ecosystems and humans.<sup>14</sup> Then, in March 2022, the world experienced skyrocketing fuel prices due to geopolitical conflicts even amidst the on-going COVID-19 pandemic. There is no denying that our communities are facing waves of shocks and stressors that cut across different domains today. With further challenges to come, we must act now to ensure we can withstand them.

For our cities and societies to survive and thrive through short-term shocks and longer-term change, we need our systems, infrastructure, and people to embody qualities of resilience. But even as we ensure that our city's infrastructure—both physical and social—is robust and has sufficient capacity for these stressors, there is also a need to ensure that our built environment enables our communities to be resilient as well.

By adopting inclusive, integrated, and participatory approaches to urban development,

the process of building infrastructure can also become a process of building community resilience. The journey taken with multiple stakeholders to understand local issues and develop community-owned interventions can help citizens develop capabilities and capacities so that they can be in a better position to act, learn, and adapt to future scenarios of shock and stress.<sup>15</sup> Having effective frameworks and mechanisms that enable communities to communicate and coordinate with government, knowledge experts, and each other also improves alignment of goals and efficacy of action, all while optimising the use of available resources.

But even as we recognise the need to build resilient communities, its invisibility makes it an inherent challenge for cities to fully understand its existing state and therefore to plan for it. Our community resilience indicators thus aspire to address this challenge and offer a useful monitoring tool for communities and city leaders. With the ability to have a sense of the state of community resilience, tactical efforts can be carried out to strengthen aspects of it over time. After all, the work of building community resilience must persist for Singapore to be better prepared to build back better.



The greening initiative along Cambridge Road is among one of the many community interventions that hopes to build up the community's adaptability to address future challenges.  
Source: CLC

## OPINION

# THE ROLE OF THE BUILT ENVIRONMENT IN BUILDING RESILIENCE



**Larissa Begault**  
Co-Founder and Principal,  
*Make Public*

**Amy Chester**  
Managing Director,  
*Rebuild by Design*

When hurricanes barrel up coastlines, tsunamis wash away villages, wildfires burn at speeds that cannot be managed, and droughts dry up economic livelihoods—and even worse, critical nourishment for society—disasters leave both a physical and a social impact on our lives. Building physical resilience to cope with disasters is essential to addressing increasing vulnerability to climate change.

The built environment plays an outsized role in how a community fares during an extreme climate event. In Eric Klinenberg's examination of the 1995 Chicago heat wave, he studied the outcomes for an unprepared city, where the heat index rose above 120°F (48°C) for a week. By the end of that event, 739 people had died. Klinenberg analysed why some neighbourhoods with similar demographic contexts had less deaths than others and found that the neighbourhoods with higher population density, busy commercial life in the streets, and vibrant public spaces, were places where community members were more likely to live than places that were experiencing urban decay, such as where streets are lined with boarded up windows or empty lots where houses once stood.

Klinenberg's work found that the communities that knew one another and where neighbours checked in on one another—as was the case in the Chicago heat wave—it was a life-or-death situation. Public spaces such as sidewalks, parks, community gardens, community centers and libraries are all examples of social infrastructure that connect neighbourhoods through the formation of social networks using physical space. In times of environmental, social and economic crises, social networks are key for communities to build resilience.<sup>16</sup>

No matter the type of disaster—health or climate—urban spaces provide public and mental health benefits to community members by providing safe spaces to play, exercise, and say hello to neighbours. When Superstorm Sandy hit, organisations whose offices were flooded and faced power cuts used these spaces as bases from which they checked on neighbours and distributed food and clothing. These spaces were also used as temporary communication centres until the City’s response efforts were up and running.

Cities around the world are beginning to see how physical spaces can be designed in ways to foster community resilience. For instance,

the “[BIG U](#)”—a 10-mile (16 km) infrastructure project situated around lower Manhattan to address the storm surge after Superstorm Sandy—was designed to support physical and social resilience. Designed through the [Rebuild by Design Hurricane Sandy Competition](#), the Design Team led by The Bjarke Ingels Group (BIG) and One Architecture, analysed existing community plans authored by both the City and local institutions and asked community members to articulate their needs through a series of workshops and events. The findings revealed that the community wanted assurances that they would not be walled off from the waterfront, have access to green spaces, maintain their views of the waterfront,



The design of the “BIG U” has fostered community engagements, kept the waterfront safe and is accessible yet inclusive. Source: *Rebuild By Design/The BIG Team*

have enhanced safety and security, and have affordable programmes and concessions for the community to build local economic development. Based on this, the Design Team decided on a flood-design infrastructure that would be blended into the fabric of the community by integrating with local streets, a rebuilt and elevated waterfront park, and the new landscape in the adjacent neighbourhood, to bring communities together. The project would also involve significant investments in underground drainage improvements that would improve the capacity of the sewer system, protecting the community from future storm surges and sea-level rises.

The tenets of these learnings were used as the basis for the design of a resilience pilot project led by the Centre for Liveable Cities (CLC) and its partners in Singapore. The aim of the project was to pilot an effort to build local capacity in the community, and therefore social infrastructure, to become better prepared to withstand increased climate impacts such as flooding and heat stress in the coming decades. Under this pilot, the CLC and the local community co-designed a Community Climate Action Plan to educate the community and, in the process, build community ties. Through the process, community members worked with project partners and government agencies to use physical spaces around the neighbourhood (such as tree plantings, the creation of a green corridor and murals in back alleyways) as tools to build social relationships and educate communities about climate change.

The CLC also worked with Make Public to design a framework of indicators that could be used to guide the project and measure progress towards social resilience. The indicators included the level of knowledge gained from participation in the process, the increased connection made among the local neighbourhoods and its amenities, the increased social networks and the self-mobilising capacity

that such engagement supported. Overall, the framework showed that the process of co-designing places that support social and climate adaptation infrastructure is equally as important as building social capacity in times of crises. Throughout the research and design process, the CLC measured participants’ understanding of climate risk and sense of ownership of their neighbourhood. The indicators showed an increased understanding of future climate risk, high ownership of the process, and continued enthusiasm and engagement by the community members to act in the future at the end of the project as compared to before. There were some indicators that fared less well such as community bonds. This was likely due to the lockdowns during the COVID-19 pandemic, and thus should continue to be measured for a longer period. Building from the success of this pilot project, there is potential to replicate this process in other localities in Singapore and beyond.

It is important for cities to partner with the community in co-designing physical and social infrastructure. Neighbourhood communities are familiar with the unique vulnerabilities and problems of their live-in environment and are able to contribute ideas on ways to make their neighbourhood infrastructure smarter, more efficient and less expensive. The improved infrastructure can in turn strengthen the communities and build resilience.

**In times of environmental, social and economic crises, social networks are key for communities to build resilience.**



**Larry Yeung**  
Executive Director, Participate in Design

## OPINION

# BUILDING COMMUNITY RESILIENCE THROUGH PARTICIPATORY DESIGN AND COMMUNITY ENGAGEMENT

In recent years, public-government partnerships, such as the Singapore Together Movement, which aims to provide support for more citizen-led initiatives, are gaining momentum. Such movements aim to support citizen-led initiatives, engage communities, and instil a greater sense of agency.

While we welcome the rise of people-centric approaches, we also recognise that community engagement does not always lead to community building. The Cambridge Road project demonstrates how we can better build community resilience through participatory design and community engagement in Singapore.

Community participation is often seen as a basis of community building and resilience.<sup>17</sup> However, to build resilient communities, we need to consider community empowerment alongside community engagement strategies. Instead of simply seeking ways to engage the community, we should also be crafting ways where communities can learn from one another, as well as from practitioners and public agencies. This involves intentionally sharing our knowledge and expertise, and creating an environment for learning, experimentation and reflection. In our engagement with the community champions in Cambridge Road, we equipped them with the right knowledge and skillsets while involving them as facilitators in our design and engagement process. The community was regarded as meaningful collaborators instead of just consumers. This is a key factor in building resilience within the communities.

## Effective Community Building Takes Time, Skills, and Meaningful Collaborations

The process of community building requires sustained efforts by committed stakeholders, effective engagement and good facilitation skills. Projects where trained facilitators or community organisers are involved often end up with more well-crafted engagement questions and processes, and achievable outcomes. In the Cambridge Road project, strong collaboration among different segments of society—public agencies, design experts and community organisers—helped equip the community with the knowledge and skillsets to implement their own interventions, building the fundamentals of neighbourhood resilience.

## Embrace Differing Views and Share Engagement Data Openly

Lastly, it is important to openly share public engagement findings with the very communities who contributed the data and are affected by decisions. Often, we see project stakeholders taking a more conservative approach and limiting the community's access to these findings, for fear of public backlash, dissenting views, or mismanaged expectations. This often results in disengaged communities and works against resilience building in the long run.

For the Cambridge Road project, the project team took initiative to share public engagement data with the community. Such transparency and open sharing of engagement data encouraged more robust discussions among people. This in turn helped strengthen the problem-solving capabilities of the local communities.



Facilitators from Participate in Design engaging with community members of the Cambridge Road neighbourhood at the pop-up booths. Source: Participate in Design

Community members of the Cambridge Road neighbourhood sharing their ideas with facilitators from Participate in Design during the community workshops. Source: *Participate in Design*



**Community engagement does not always lead to community building. The Cambridge Road project demonstrates how we can better build community resilience through participatory design and community engagement in Singapore.**

While the future of a post-pandemic, climate-vulnerable world is uncertain, it offers us opportunities to reimagine what resilient communities could look like. Cambridge Road is no doubt the first step in the right direction.

Moving forward, it is important to continue to build people's collective capacity to take charge of their spatial environments, invest in relevant skills, resources and networks to create meaningful processes and outcomes, and enhance the community's access to information and data. Taking these steps will go a long way towards building strong, empowered, and informed communities.

## POSTSCRIPT

The renowned anthropologist, Margaret Mead, was once asked what she considered to be the first sign of civilisation in a culture. We might assume that she would have responded with writing or making tools. But Mead's surprising answer was a healed thigh bone. She reasoned that in the animal kingdom, a broken leg meant certain death since the injured person would not be able to escape from danger or hunt for food, and thus would not survive long enough for the bone to heal. A healed bone was therefore evidence that someone had cared for the injured person, and for a long enough period for them to recover.

Mead's observation provides us with the answer to the central question of this playbook—what makes a nation, a city, or its people resilient? Physical infrastructure, no matter how well-planned and robust, is at best a partial solution. What enables full, sustained resilience is when a community cares enough for each other and their environment, to take action.

In Singapore, one of the ways that we have responded to the quest for resilience is through the Singapore Together movement. Launched in 2019, it reflects Singapore's commitment to partnership as a governance approach. This movement provides opportunities for Singaporeans to explore and understand current issues better, hear perspectives different from their own, and most importantly, take action with others to address issues they care about and to tackle the most vexing challenges of our day.

Since Singapore Together began, numerous partnerships have begun on a wide range of issues. The Cambridge Road project described in this playbook is one inspiring example, rallying different sectors and groups together to work on short and long-term challenges. Other collaborative efforts include supporting youth mentoring, tackling online harms, environmental sustainability, and improving conditions for lower-wage workers. These projects provide a conducive platform to engage community groups, corporates, individuals, and government, in joint deliberation and action.

The Singapore Together movement was borne out of a conviction that this form of partnership enables us to expand our understanding of what it means to be a member of a community. We move from being passive consumers or complainants when things go wrong, to being owners, contributors, and co-creators of the public good. And a city or nation of owners and co-creators is what makes for a resilient nation.

The tools and case studies in this playbook show us how to foster this kind of ownership and co-creation. They are inspiring and insightful, and give confidence that the work—while challenging—is worthwhile, and the results attainable.

The uncertainties of the future are likely to increase the need for resilience—the recent pandemic, war and ongoing climate change events corroborate this idea. Good public policy and strong infrastructure can help cushion the impact on cities and their people. But it is the spirit behind the healed thigh bone—that of mutual care translated into action—that will help us go the distance.



**Dawn Yip**

*Coordinating Director,  
SG Partnerships Office, Ministry  
of Culture, Community and Youth*



## Annex

# A TOOLBOX FOR ACTION— COMMUNITY RESILIENCE KIT

Resilient communities are the enablers for city resilience. This journey into exploring how community resilience can be influenced proves that it is possible to build community resilience by design.

The work continues in testing and adjusting these frameworks and approaches to adapt to other scenarios and at different scales. As each community has its unique set of environment, shared history and practices, each community will develop resilience in different ways. Thus, it is important in the pursuit of the study of community resilience to better understand the underlying mechanisms and impacts surrounding the topic of resilience.

To help communities embark on their own journeys, the Centre for Liveable Cities has

created a selection of tools that communities can use to chart progress and embark on projects that can help build community ties.

Overtime, a toolbox will be developed to help government agencies and citizens build community resilience in communities across the country. This toolbox will contain frameworks to guide and ground action, as well as a collection of methods and tools covering the how-to for planning and design, strategic risk communications, and effective community engagement.

A community's potential to build resilience is dependent on the participation of every community member. Cities that can build resilient communities will become resilient cities.

## TOOL TABLES



### INTERCEPT SURVEYS

#### Q What is an intercept survey?

- ◆ A feedback collection session from community members on their experience regarding a topic of interest.

#### Q How is it done?

- ◆ Approach community members to initiate informal conversations to collect sentiments and sense the pulse from the ground.

#### Q Who do I work with?

- ◆ Local neighbourhood offices, e.g., People's Association, Family Service Centres.
- ◆ Members of local neighbourhood organisations and community stakeholders, e.g., Residents' Network, Residents' Committee, Neighbourhood Committee, local businesses, business associations.
- ◆ Interested residents.

#### Q What should I consider?

- ◆ Keep questions short to maximise the amount of information that can be gathered in a short period of time.
- ◆ Be adaptable to respondents' needs and comfort level.
- ◆ Conduct the survey at various times of the day and days of the week to capture a diversity of respondents.

#### Q How can it help me?

- ◆ It validates points of discussion to reinforce approaches, methodologies, and frameworks.
- ◆ It unearths informational gaps in and alternative perspectives from the community.

### WALKING CONVERSATIONS



#### Q What are walking conversations?

- ◆ A consultation with community members on their experiences, to get a sense of the strengths and resources within a neighbourhood.

#### Q How is it done?

- ◆ Walk the neighbourhood to observe people, spaces, sights, and sounds with a group of community members and having short discussions at various checkpoints and/or landmarks.
- ◆ Could be self-led or led by a seasoned resident or community engagement facilitator.

#### Q Who do I work with?

- ◆ Local neighbourhood offices, e.g., People's Association, Family Service Centres.
- ◆ Members of local neighbourhood organisations and community stakeholders, e.g., Residents' Network, Residents' Committee, Neighbourhood Committee, local businesses, business associations.
- ◆ Interested residents.

#### Q What should I consider?

- ◆ Scout the neighbourhood in advance and identify key areas for consideration and potential intervention points to structure the route.
- ◆ Create a safe and accessible space to encourage participants to share their views and experiences.
- ◆ Allocate extra time to buffer for new points of interest raised by participants that are off the intended route, which help to address any potential blind spots.

#### Q How can it help me?

- ◆ It provides a snapshot of challenges, visions and aspirations community members have for their neighbourhood.
- ◆ It provides a collaborative roadmap for future design interventions and opportunities.



Residents recounting anecdotes of the neighbourhood's flooding history at the old flood gauge along Cambridge Road.  
Source: CLC





## FOCUS GROUP DISCUSSIONS



Residents participating in a focus group discussion led by experts from the Institute for the Public Understanding of Risk and Participate in Design.  
Source: Olivia Jensen

### Q What are focus group discussions?

- ◆ An open discussion to collect information on a range of opinions, beliefs and feelings on a topic of interest from a group of community members.

### Q How is it done?

- ◆ Recruit between 6–10 participants to participate in a discussion structured around a set of predetermined questions led by a moderator.

### Q Who do I work with?

- ◆ Local neighbourhood offices, e.g., People's Association, Family Service Centres.
- ◆ Members of local neighbourhood organisations and community stakeholders, e.g., Residents' Network, Residents' Committee, Neighbourhood Committee, local businesses, business associations.
- ◆ Interested residents.
- ◆ Research and academic experts.

### Q What should I consider?

- ◆ Participants should feel comfortable with one another; establish inclusion/exclusion criteria where necessary.
- ◆ Keep questions short, to the point and open-ended to encourage responses.
- ◆ Can be complemented by surveys to enrich the information collected as the discussion may not reveal the frequency with which opinions are held within the community.

### Q How can it help me?

- ◆ It can be used to study group dynamics which are relevant to community-level actions.
- ◆ It validates points of discussion to reinforce approaches, methodologies, and frameworks.
- ◆ It unearths informational gaps and alternative perspectives from the community.

Adapted from Creative Engagement Toolkit by Participate in Design ([www.participateindesign.org](http://www.participateindesign.org))



## POP-UP BOOTHS

- Q What are pop-up booths?**
  - ◆ A transient sharing session on an issue of interest to gather a community's ideas on ways to address it.
- Q How is it done?**
  - ◆ Curate a set of problem statements and seek the community's inputs and ideas.
  - ◆ Often appearing unscheduled and uninformed at a local community node where there is high community footfall.
- Q Who do I work with?**
  - ◆ Local neighbourhood offices, e.g., People's Association, Family Service Centres.
  - ◆ Members of local neighbourhood organisations and community stakeholders, e.g., Residents' Network, Residents' Committee, Neighbourhood Committee, local businesses, business associations.
  - ◆ Interested residents.

- Q What should I consider?**
  - ◆ Survey the neighbourhood to locate areas with high footfall for maximum exposure.
  - ◆ Keep questions short to maximise the amount of information that can be gathered in a short period of time.
  - ◆ Be adaptable to alternative ideas and responses.
  - ◆ Leverage the sessions to recruit interested community members for further engagement and involvement.
  - ◆ Have facilitators who understand different languages/dialects to capture diverse views.

- Q How can it help me?**
  - ◆ It leverages community assets to provide ideas for potential implementation.
  - ◆ It generates a sense of community and ownership in driving collective actions for a common goal.



Community members from all walks of life contributed their ideas to make their neighbourhood more climate resilient. Source: CLC

Adapted from Creative Engagement Toolkit by Participate in Design ([www.participateindesign.org](http://www.participateindesign.org))

## PROTOTYPING



- Q What is it?**
  - ◆ A showcase of low-cost, fast and tactical interventions to test its functions and effectiveness while generating quick wins and concrete outcomes with the community's involvement.
- Q How is it done?**
  - ◆ Develop feasible models or small-scale interventions in an environment, utilising ideas and suggestions generated from prior ideation sessions.
- Q Who do I work with?**
  - ◆ Local neighbourhood offices, e.g., People's Association, Family Service Centres.
  - ◆ Government agencies and experts.
  - ◆ Members of local neighbourhood organisations and community stakeholders, e.g., Residents' Network, Residents' Committee, Neighbourhood Committee, local businesses, business associations.
  - ◆ Interested residents.

- Q What should I consider?**
  - ◆ Prioritise design ideas and develop those with the potential to maximise impact to the community within a short timeframe.
  - ◆ Adjust and adapt the design based on available resources, e.g., finance, manpower, land use, etc.
  - ◆ Explore tweaking and building of existing urban infrastructure instead of starting from scratch.
  - ◆ Articulate the purpose of prototypes to better manage the community's expectations.
- Q How can it help me?**
  - ◆ It helps to make ideas tangible.
  - ◆ It enhances involvement of the community in the ideas that they co-created.
  - ◆ It generates groundswell that can further conversations and motivation for future community-led projects.



A rain-garden demonstration to educate and share with community members the design features that can be used to cleanse rainwater while beautifying the surround landscape and enhancing biodiversity. Based on the community's feedback, there are plans to implement it on a larger scale within a future park development in the neighbourhood. Source: CLC

Adapted from Creative Engagement Toolkit by Participate in Design ([www.participateindesign.org](http://www.participateindesign.org))



## COMMUNITY WORKSHOPS

### Q What are community workshops?

- ◆ Small group workshops among community members to brainstorm and contribute ideas and design interventions alongside designers and stakeholders.

### Q How is it done?

- ◆ Curate a set of problem statements and organise sit-down sessions to seek the community's input on possible ideas.
- ◆ Sessions are scheduled and sign-ups are encouraged to curate the appropriate group dynamics.

### Q Who do I work with?

- ◆ Local neighbourhood offices, e.g., People's Association, Family Service Centres.
- ◆ Government agencies and experts.
- ◆ Members of local neighbourhood organisations and community stakeholders, e.g., Residents' Network, Residents' Committee, Neighbourhood Committee, local businesses, business associations.
- ◆ Interested residents.
- ◆ Community engagement experts.

### Q What should I consider?

- ◆ Have a clear understanding of the intended purpose of the workshops.
- ◆ Explore a range of approaches to gather ideas, e.g., participatory budgeting, gamification, etc.
- ◆ Keep group size manageable to provide time for each participant to contribute.
- ◆ Encourage participants to build on one another's ideas.
- ◆ Put out publicity materials to encourage sign-ups prior to the workshops.

### Q How can it help me?

- ◆ It provides platforms to gather community feedback and opinions.
- ◆ It helps to co-create plans and identify community actions.
- ◆ It empowers the community's sense of a shared responsibility in addressing issues.
- ◆ It identifies key community members that can spearhead community projects.



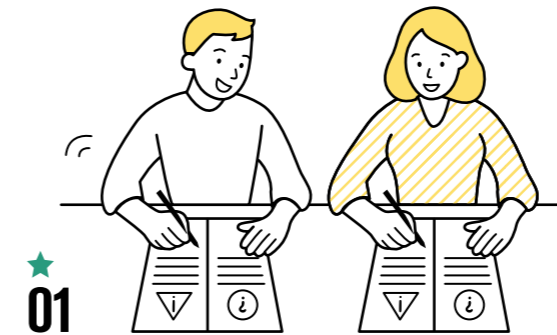
Residents sharing feedback and contributing ideas for future projects and plans. Source: CLC

## A JOURNEY THROUGH A COMMUNITY-OWNED PROJECT

# BUILDING INTERVENTIONS, BUILDING COMMUNITY RESILIENCE

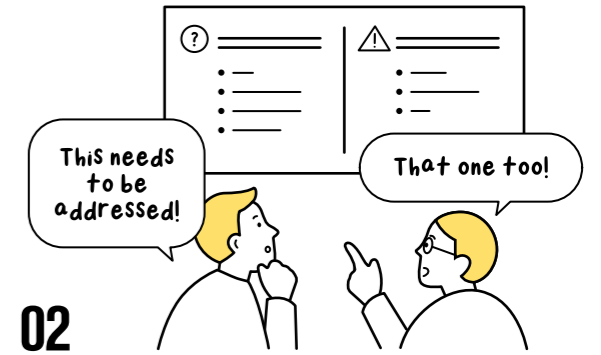
Every community and every challenge is different but this journey will help to give you a general idea of the various stages that may be required.

★ Use assessment tool!



★  
01

**Understand** your community's resilience by using the assessment tool. Do it with your peers and neighbours.



02

**Review** your community's report card and identify key shocks and stressors that your neighbourhood is facing.



03

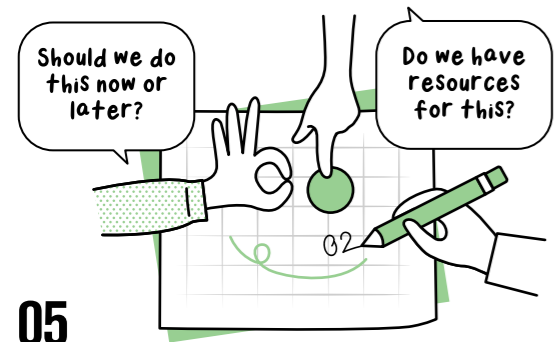
**Rally** your neighbours, grassroots leaders, public service officers, knowledge experts, and local businesses together. Get them on board to do something about these local issues and build a shared vision together. This will be your community champions.



★  
04

**Crowdsource** ideas with your team and other residents. Be creative about how to achieve your vision. Also think about how these ideas can be mutually sustainable.

A JOURNEY THROUGH A COMMUNITY-OWNED PROJECT



05

**Prioritise** your ideas. There are limited resources and some may take too long to realise while some are just too urgent to ignore.



06

**Planning** is the stage where detailed discussions happen, and approvals and buy-ins are sought. Things get real here, but persevere as a team.



07

**Equip** the community with resources and knowledge. Secure sponsors, attend webinars, get hands on training, and buy tools. Use information from the planning phase to help decide what is needed.



08

**Co-building!** Time to get the entire community to come and turn ideas into reality. Make it a community gathering.



09

**Monitor** what you have built together. Did it help address the issue? Did it bring the community together? What worked and what can be done better?



10

**Sustain** all the good work that has been done. Come up with a roster, have a regular maintenance plan, find resources to keep it going and improve it over time.

A COMMUNITY RESILIENCE REPORT CARD

# HOW RESILIENT ARE WE?

This is a self-administered tool to quickly assess the state of resilience in your community. Get a few people in your team to do it to get diverse views and then discuss your answers to arrive at a consensus.

Use this at the beginning to establish a baseline, then use it at key milestones such as after brainstorming, after building the intervention, and some time after it has been completed. You can refer to the visual guide on page 91 and 92 to get an idea of when to use it.

This questionnaire will take 10 minutes to complete.

While we have used *climate change* as the topic, please do adapt these statements to address the risk/threat/challenge that you are trying to address.



A COMMUNITY RESILIENCE REPORT CARD

## Resilience Dimension: Climate Change Awareness

Please assess the following statement from a scale of 1 to 5:

	Strongly disagree 1	Disagree 2	Neither agree nor disagree 3	Agree 4	Strongly agree 5
<b>Informational knowledge</b> Climate change is an urgent issue in Singapore.					
I understand what <i>climate change</i> means.					
I have learnt something about <i>climate change</i> through the process that I did not already know.					
<b>Actionable knowledge</b> We can address the impacts of <i>climate change</i> by working together as a community.					
I know what actions I can take to address <i>climate change</i> through the process.					
<b>Intention to Act</b> I am concerned about the impacts of <i>climate change</i> .					
More actions are needed to better cope with the impacts of <i>climate change</i> in the neighbourhood.					
I feel that communities can take the lead to address the impacts of <i>climate change</i> .					

A COMMUNITY RESILIENCE REPORT CARD

## Resilience Dimension: Social Capital and Cohesion

Please assess the following statement from a scale of 1 to 5:

	Strongly disagree 1	Disagree 2	Neither agree nor disagree 3	Agree 4	Strongly agree 5
<b>Community Bonds</b> I have developed close relationships with my neighbours through the process.					
I have developed close relationships with my community through the process.					
People of different social groups (e.g., different ages, nationalities, religions, ethnic groups) generally interact well with one another in my community.					
<b>Community Trust</b> I trust that others in my community will offer help to me when I need it.					
I trust members of my community.					
<b>Sense of Community</b> I feel a sense of belonging to my neighbourhood.					
I feel a sense of belonging with people in my community.					
I feel proud to be part of the community initiative.					

A COMMUNITY RESILIENCE REPORT CARD

## Resilience Dimension: Social Capital and Cohesion

Please assess the following statement from a scale of 1 to 5:

	Strongly disagree 1	Disagree 2	Neither agree nor disagree 3	Agree 4	Strongly agree 5
<b>Collective Efficacy</b> I feel I can work with my community to improve our well-being.					
I feel I can initiate projects with others in the community.					
<b>Community Engagement</b> I encourage my neighbours and residents to participate in projects for my community.					
I have met new neighbours/residents through community projects.					
The engagements in the community projects reflect the community's visions for the neighbourhood.					
I am happy to stay involved in the community projects.					
<b>Crisis Preparedness</b> I feel my community is prepared to address future challenges.					
I know resources in my community to address future challenges.					

A CHECK-IN WITH YOUR COMMUNITY ON THE PROJECT

## REFLECTING ON RESILIENCE

A project designed to build community resilience should display these qualities. Think of these as prompts to reflect on and keep you focused on the bigger goal. We suggest using these at key junctures of decision-making as a check-in with yourselves.



## A CHECK-IN WITH YOUR COMMUNITY ON THE PROJECT



## Integrated

**Did the community work together in an integrated manner? Did we think of various elements of the project in an integrated manner?**

Integration and alignment between city systems promotes consistency in decision-making and ensures that all investments are mutually supportive for a common outcome. Integration is evident within and between resilient systems, and across different scales of their operation. Exchange of information between systems enables them to function collectively and respond rapidly through shorter feedback loops throughout the city.

Resourcefulness implies that people and institutions are able to rapidly and in different ways, achieve their goals or meet their needs even during a shock or when under stress. This may include investing in the capacity to anticipate future conditions, set priorities, and respond, for example, by mobilising and coordinating wider human, financial and physical resources. Resourcefulness is instrumental to a city's ability to restore functionality of critical systems under severely constrained conditions.



## Resourceful

**Were we as a community resourceful in finding answers, financial support, and physical resources for our project? Were we able to find ways to work around constraints?**

Inclusion emphasises the need for broad consultation and engagement of communities, including the most vulnerable groups. Addressing the shocks or stressors faced by one sector, location, or community in isolation of others is an anathema to the notion of resilience. An inclusive approach contributes to a sense of shared ownership or a joint vision to build city resilience.



## Inclusive

**Did we consult and engage as many segments of our community as possible for the project? Did this project intentionally or unintentionally exclude some segments of our community or make their quality of life worse?**

Reflective systems are accepting of the inherent and ever increasing uncertainty and change in today's world. They have mechanisms to continuously evolve, and will modify standards or norms based on emerging evidence, rather than seeking permanent solutions based on the status quo. As a result, people and institutions examine and systematically learn from their past experiences, and leverage this learning for future decision-making.

*Adapted from "Qualities of Resilient Systems" in City Resilient Framework by Arup and the Rockefeller Foundation*



## Reflective

**Did we allow ourselves and the project to evolve as we discover more evidence, opportunities, or challenges along the way? Did we take moments to learn from our past experiences to help us with decision-making?**

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# BUILDING COMMUNITY RESILIENCE

In the face of today's complex urban challenges, the whole of society must work together to adapt and find ways to thrive. Lessons learnt through responding to shocks and stressors have shown that community resilience—built upon social infrastructure and social capital—drives recovery. So how can we build community resilience within our cities? What is the role of community engagement and participatory design in strengthening social infrastructure and building social capital? How might we give form to and enhance the invisible sense of community resilience in the built environment?

This playbook documents research undertaken by the Centre for Liveable Cities to measure and strengthen social capital and community resilience through a co-creation journey. It showcases how a multi-stakeholder framework nurtures citizen-initiated projects that can not only address local challenges but also support broader national efforts. The research also demonstrates how a range of indicators offer insights into the state of community resilience and enables communities and policymakers to track progress as well as identify strengths and areas for improvement. We hope that the insights captured in this playbook will inspire cities to work with their citizens to develop a comprehensive strategy for resilience—which involves not only improving its hardware but also enhancing its software. Ultimately, there can be no resilient city without a resilient community.

