



Article

## Building Resilience through Collective Engagement

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### Abstract

The basic premise of this study is that the collective engagement of the citizens in a disaster-prone city helps transform their city to become resilient. Many urban managers encourage citizen participation by providing a venue for citizens to engage in public issues, including those of city planning and management. Citizen participation is important in building a cohesive community, empowering its citizens, and enhancing their sense of ownership of their community and city as a whole. The research underscores that collective engagement and action have an influence in the transformation of a city. The study will use the concept of resilience in the socio-ecological systems context to build a conceptual framework on the transformation process. Cities are ecological systems with both natural- and built-environment characteristics. Cities are complex multidimensional systems with both the social (human) and the ecological (natural and built environments) tied together. The changing landscape and continuous exposure to disturbances put pressure on the social and ecological systems of a city. The paper discusses collective engagement as a systemic process for how a disaster-prone city transforms itself to become disaster resilient. Using the concept of panarchy as a process of adaptation and transformation, the paper will build a conceptual framework that highlights collectiveness as a way to become resilient. The paper underscores that collective engagement and action have an influence in the transformation of a city.

**Keywords:** resilience; collective engagement; flooding disaster; collective engagement urban resilience framework

## **Introduction**

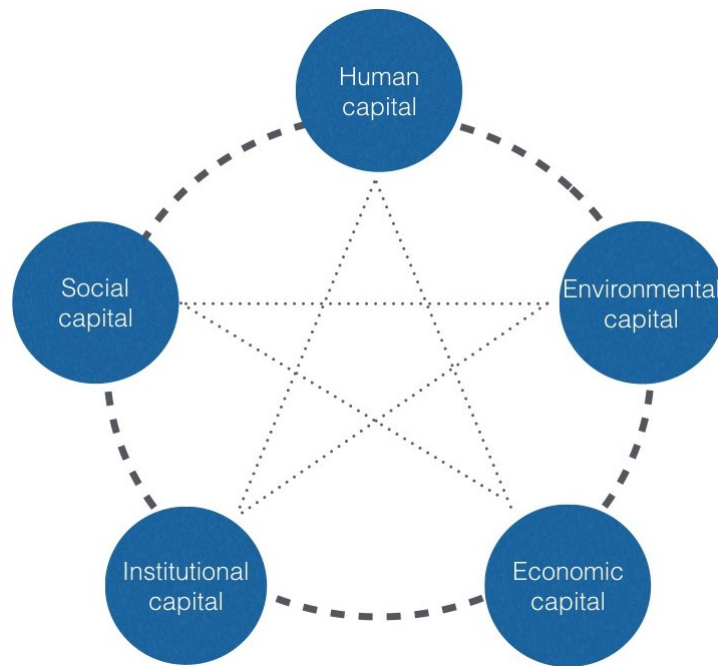
This paper discusses collective engagement as a systemic process for how a disaster-prone city transforms itself to become disaster resilient. People thrust into disaster situations naturally gravitate to work together in rebuilding their lives and communities, mainly because it is a need. Two elements of disaster resilience are apparent in this situation: social capital and collective efficacy.<sup>1</sup> The social capital of disaster-affected communities determines their ability to effectively form partnerships with key actors that can help in rebuilding and reconstruction. In this context, it can be considered that stakeholders in disaster situations collectively engage, and jump six rungs up Arnstein's ladder of citizen participation to reach the partnership rung. However, Arnstein also pointed out that partnerships work effectively with an organised power base in the community where citizen leaders are held accountable and when resources, financial or otherwise, are available.<sup>2</sup> This suggests that the increasing degree and level of participation is formed not just intrinsically, but also through external influences that sharpen the decisional aspect of participation. Citizen participation is important in building a cohesive community, empowering its citizens and enhancing the sense of ownership of the city. The research underscores that collective engagement and action have an influence on the transformation of a city. Using the concept of panarchy as a process of adaptation and transformation, this paper will build a conceptual framework that highlights collectiveness as a way to become resilient.

## **Resilience and Transformation**

The term 'panarchy' was used by Gunderson and Holling to expand the concept of resilience to describe the interaction and interlinkages in human and natural systems, and the continuous adaptive cycles of growth and restructuring.<sup>3</sup> Panarchy is an organising framework for theory, dealing with cross-scale dynamics in natural and social systems.<sup>4</sup> It has two premises: first, that a set of adaptive cycles are arranged as a dynamic hierarchy in space and time;<sup>5</sup> second, that the adaptive cycles go through different phases and interact or connect with one another at different levels.<sup>6</sup> Resilience represents a dimension of the adaptive cycle consisting of entrepreneurial exploitation, organisational consolidation, creative destruction, and restructuring.<sup>7</sup>

Cities are complex socio-ecological systems that interact at the individual, community, local and national levels, before, during and after the onset of disasters. The capacity of a city to adapt and transform shapes the very nature of resilience. Adaptability refers to the collective capacity of the human actors in the socio-ecological system to manage<sup>8</sup> and influence resilience.<sup>9</sup> Transformation, on the other hand, is 'the capacity to create a new system when the ecological, economic, social and political structures make the existing system untenable'.<sup>10</sup> Transformation of a disaster-prone city into a disaster-resilient city requires an exploration of the city as a socio-ecological system in varying dimensions. Transformation, similar to adaptation, requires an understanding of the roles that each stakeholder contributes to the city's overall function. It is the ability of the system to shift from its current normal state to another state of development or an improved state.<sup>11</sup> Therefore, it can be said that transformation is a result of the improvement of the system that occurs during the adaptation process.

Natural hazards such as flooding are one type of disturbance that prompt change in cities. Cities that have experienced a disaster often go through a series of transformations at different levels and scales. The capacity of the city to transform and adapt is driven by five types of capitals<sup>12</sup> that provide the necessary input for the city to reach a level of resilience that in turn is the output (see Figure 1). Capacity is the combination of all the strengths, attributes and resources available within an organisation, community or society to manage and reduce disaster risks and strengthen resilience.<sup>13</sup> This combination of strengths, attributes and resources can be translated to capital or assets that befit the collective engagement narrative in the disaster context.



**Figure 1** Five drivers of resilience. (Source: Author adaptation based on the five sustainable development capitals).<sup>14</sup>

### **Collective Engagement: Is It Just Another Term for Participation?**

Definitions of collective engagement are few and far between. Ilon and Kantini defined collective engagement within the context of sustainable development, writing: ‘Development efforts should be concerted from local to global levels. National and international interests have to be harmonized or balanced to ensure that tension in terms of interpretation and implementation of sustainable development is reduced.’<sup>15</sup> This gives a broad definition of what collective engagement is, but it does not emphasise how these interests are harmonised or balanced, nor does it identify the actors who are involved within the collective engagement sphere. The World Bank tried to bring this together in their definition of civic engagement as ‘the participation of private actors in the public sphere, conducted through direct and indirect interactions of civil society organizations and citizens-at-large with government, multilateral institutions and business establishments to influence decision making or pursue common goals.’<sup>16</sup> While the World Bank’s definition of civic engagement identifies broadly who these actors are, their roles have not been specified, and nor has the manner of how civic engagement is implemented at the multilateral level. Idealising the direct and indirect interactions as defined by the World Bank does not fully grasp the concept of collective engagement, nor does it provide the grounds for how these interactions are carried out.

Collective engagement is characterised by the involvement of stakeholders coming from any level or position in society whose concerns range from issues that affect the community, city, regional, national and global levels. It is inclusive and continuous, a guide for stakeholders in developing an integrated solution to meet a common goal, and it is consensual and balances the interests of the local, national and international players. These three ideas influenced Esteban’s definition of collective engagement in a study of three communities in Tacloban City, in the Philippines:

The active collaboration of citizens in general on societal or communal issues affecting their community (town or city), developing active relationships with different actors in the community, and engaging in debate and finding solutions to these issues. Collective engagement further means the collaboration of the different actors in the community at the local, regional, national, and global levels. It is the ability to engage these actors successfully and positively, over a prolonged period rather than on a project-by-project basis, to attain a balance of opinions and actions to improve the community, whether this be at the local or national level.<sup>17</sup>

In this definition, collaboration between and among actors at different institutional levels is emphasised. While the definition is in the context of the study of recovery and rehabilitation, there is a need to revisit this definition to be able to emphasise the transformative action for how a disaster-prone city evolves into a disaster-resilient city. There are two types of 'citizen action' that influence collective engagement: participation and self-organisation. Participation is taken to be an initiative of the government to educate, inform and allow citizens to engage in decision-making activities, while self-organisation is an action initiated by the citizens themselves. The questions arise of whether collaboration between the government and the stakeholders builds urban resilience, whether an institutional and organised structure alone enables urban resilience, or whether a smaller more autonomous system better promotes urban resilience.

Collaboration is an important facet in the study of disaster and resilience. There are two views about this in disaster management: one that sees that command and control systems are more appropriate in dealing with disasters (this view is usually taken during a disaster); the other sees that collaboration is necessary to ensure the continuous move towards resilience. Collaboration is the ability to tie together responsibilities among all stakeholders and to work towards one goal. This cross-sector collaboration involves stakeholders working in partnership<sup>18</sup> towards mutual goals in the form of both informal and formal collaboration between sectors and organisations.<sup>19</sup> Cross-sector collaboration suggests that the collaboration between the public and private spheres can solve wicked problems.

In public management, such collaboration has been described as the 'process of facilitating and operating in multi-organizational arrangement in order to remedy problems that cannot be solved – or solved easily – by single organization.'<sup>20</sup> The existence of various actors and sectors within an urban system requires the collaboration of these stakeholders in order to identify their own individual and sectoral weaknesses and strengths that contribute to a given urban issue, as well as to provide the necessary input to the overall improvement of the urban system. The concept adheres to the deliberative participatory processes, emphasising that stakeholders are not merely consulted,<sup>21</sup> but are part of the decision-making process. Bingham et al. emphasise in their definition of collaborative public management that collaboration involves co-labour in achieving common goals through working across boundaries and multi-sector and multi-actor relationships, and that it is based on the value of reciprocity.<sup>22</sup>

Collective engagement is within the realm of collaboration and collaborative processes. Similar to collaborative public management, collective engagement is a process whereby multiple stakeholders across sectors and networks engage in collective decision making and action. However, unlike collaborative public management, these vertical and horizontal interrelationships need not be formalised in order to achieve a common goal. Kapucu et al. point out that 'collaborative public management refers to coordination among various government agencies, collaboration amongst various organizations across jurisdictional and sectoral lines, and cooperation with private citizens and neighborhood associations'.<sup>23</sup> The concentration is on network management, and on localities focusing on issues that cannot be dealt with by a single organisation. Kapucu et al. distinguish this from collaborative governance by stating that collaborative governance looks at issues of democracy and the public's role in shared decisions, both process and substance.<sup>24</sup>

The distinction made by Kapucu et al. about collaborative governance being process- and substance-oriented is appropriate in developing the concept of collective engagement. Collaborative governance, just like collaborative public management, has no definite conceptual definition.<sup>25</sup> Ansell and Gash define collaborative governance as 'a governing arrangement where one or more public agencies directly engage non-state stakeholders in a collective decision-making process that is formal, consensus-oriented, and deliberative and that aims to make or implement public policy or manage public programs or assets.'<sup>26</sup> This definition suggests a more government-initiated collaboration with non-state actors in making shared decisions on public policies and public management. Emerson et al. define collaborative governance as 'the process and structures of public policy decision making and management that engage people constructively across the boundaries of public agencies, levels of government, and/or the public, private and civic spheres in order to carry out a public purpose that could not otherwise be accomplished.'<sup>27</sup> This definition is quite similar to the definition of collaborative public management,

where it is seen that collaboration is needed to solve an issue or problem that cannot be solved solely by a single organisation. Collaborative governance is a more institutionalised approach to a collective decision-making process.<sup>28</sup>

From this discussion, collective engagement in relation to urban resilience and disaster management is proposed to be:

A collaborative process participated in by multiple stakeholders to arrive at a solution or decision to increase urban resilience through both formal and informal means. It is the collaboration between and among stakeholders over a prolonged period in various manners to achieve a level of resilience that contributes to a collective goal of urban resilience. Collective engagement as a collaborative process is characterised by involving reciprocity, trust and mutual respect between and among state and non-state stakeholders.

In a study of disaster recovery and rebuilding, reciprocity among networks has likewise been identified as building trust among disaster-affected households and communities, leading to higher levels of engagement and collective decision making and action, thereby achieving a level of efficacy.<sup>29</sup> Reciprocity is crucial to human cooperation, and results in people gaining mutual benefits from a helpful act,<sup>30</sup> building trust,<sup>31</sup> and cooperation to contribute to a collective good.<sup>32</sup> As such, it is an important facet of collective engagement.

### **Collective Engagement and Disasters**

The disaster management cycle is a process by which individuals, communities and organisations prepare for, respond to, recover from, and seek to prevent extreme events.<sup>33</sup> The first of the four phases, *preparation*, refers to preparedness planning – the activities and measures undertaken in advance to prepare for disasters.<sup>34</sup> This can be in the form of early warning systems, development of community recovery plans, and preparation of household emergency kits.

The second phase, *response*, begins immediately after a disaster, focusing on search and rescue, evacuation, provision of relief goods and medical attention, and construction of temporary shelters. At the onset of the disaster, and during the immediate response, the command and control responsibility of the government is required to maintain order. Jahangiri et al. assert that ‘it is necessary for the untrained people to stay more passive in order not to add to the chaos and disorder’<sup>35</sup> during the immediate disaster and rapid response phase. This requires governments to prepare arrangements and plans to carry out effective measures in dealing with the disaster, such as rescue missions, identifying immediate evacuation sites, and providing for other relief measures. During this phase, disaster-affected stakeholders can actively participate by volunteering, and collaborating and partnering with other relevant organisations in responding to disasters. However, this should be coordinated with the local government as security issues may arise during the disaster response and recovery phases that need to be controlled from the top.

The third phase, *recovery and rehabilitation*, concerns actions undertaken after the disaster to recover, restore, rehabilitate, rebuild, and improve the well-being of the disaster-affected community.<sup>36</sup> In disaster situations, community involvement in rebuilding activities naturally occurs, mainly because it is a need. This is consistent with ‘edge of chaos’ behaviour as a catalyst for the formation of self-organising systems.<sup>37</sup> Disaster-affected communities self-organise primarily because they need to survive and move on with their lives. People naturally gravitate to work together in rebuilding their lives and communities. If the local government is unresponsive to the disaster-affected community’s primary needs at the onset of the disaster, and during the response and recovery phases, there is a tendency for these communities to self-organise. The self-organisations help in developing their own solutions in recovery, such as tapping into non-government organisations and humanitarian aid that are present for support.

Self-organisation emerges due to the disaster-affected communities’ intrinsic need and concern to rebuild and recover from the disaster experience. This concern propels the community to organise and take action. The effectiveness of this self-organised initiative to recover goes hand in hand with an external influence, which could be the government, or a network of humanitarian workers or international non-government organisations working on disasters. However, in order to ensure that disaster-affected

communities maintain a level of security, this self-organisation should be able to transcend the local level and marry into the government initiatives. This process requires the mutual adaptation of the roles of both actors (community and government) in maintaining resilience, which leads to the first proposition about collective engagement:

Stakeholders have strong social networks and are collectively involved in matters pertaining to city development. They are tied to the city and its vision to become resilient. This means that stakeholders are aware, informed, and prepared for disasters.

The last phase, *prevention and mitigation*, involves measures of reconstruction to prevent and mitigate future disaster events. Boshier and Chmutina refer to this as ‘mitigative adaptations’,<sup>38</sup> which are the structural and non-structural measures undertaken to prevent, mitigate and/or adapt to disaster events.

From the recovery phase until the preparation phase in the disaster management cycle, the stakeholders need to collectively engage so that they can recover and rebuild. However, stakeholders can only collectively engage if they have the capacity to do so. Technological, engineering, scientific, climate and disaster-proofing activities are usually undertaken during the prevention, mitigation and adaptation phases to eliminate or reduce hazard impacts. These activities should also go hand in hand with information and education for the general populace in order to reduce the vulnerability of the stakeholders. By increasing the knowledge and skills of stakeholders, they can adapt, actively participate and effectively implement community and city development plans. This leads to the second proposition about collective engagement:

Strong information and education on disaster management provided to all stakeholders on disasters is effective if widely shared and accessible to all.

### **Collective Engagement and Urban Resilience**

The city as a complex, multidimensional socio-ecological system undergoes changes that affect the way it functions for better or worse. The city’s adaptive capacity helps it to transform to a point of stability that enables it to function at a normal or near normal state after a disturbance such as flooding disaster. This ability to adapt and transform makes the city resilient. The capacity of the city stakeholders in different sectors of society – such as private organisations, government and academe – to collectively act to support each other and work together helps this transformation.

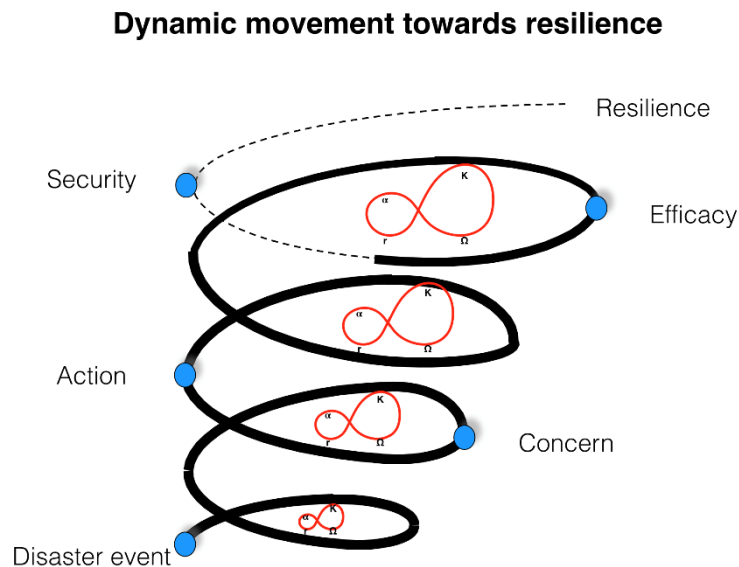
Because of this, there is a need to expand the knowledge and awareness of people in order for them to participate, engage and collaborate in transforming their city. Resilience requires public concern,<sup>39</sup> and capacitating the stakeholders increases their knowledge and skills, thereby increasing their ability to participate. There is a need to deepen the stakeholders’ understanding of what they can and cannot do in terms of development that will affect the general populace. Improved civic and political knowledge, and awareness of civil rights, empowers citizens and increases government accountability. The vision for the city must be understood and accepted by all stakeholders in order for them to perform their roles to achieve this collective vision for the city. This mutual adaptation of roles, coupled with mutual respect and collaboration among the stakeholders, is the main point in the third and last proposition on collective engagement:

The government and the stakeholders must understand the need to have a cohesive community in order to address disasters. Both the government and the stakeholders must be committed to the same goal of creating a resilient urban system. There should be a balance of power in terms of decision making among all actors, and this can be seen in the development and implementation of plans.

The exercise of collective engagement in the disaster situation is the symbiosis of participation and empowerment where the stakeholders participate and are involved in the planning and rebuilding activities resulting in actual transformation. However, rebuilding a community, and in general the city, which has been hit by a disaster is not the end in ensuring a disaster-resilient community or city. To have effective city disaster management, the collective engagement of stakeholders must be honed from the beginning of, and even prior to, the occurrence of a disaster. Participation of stakeholders in disaster management equips them with knowledge about disasters, and the ability to act and react to the disasters that may occur.

## Collective Engagement Urban Resilience Framework

Building urban resilience through collective engagement is a dynamic process of transformation that emerges from the city's disaster experience. Figure 2 indicates that a disaster event (whether a recent or a distant past experience) provokes city stakeholders to behave or act on this experience to improve their situation. The movement of the spiral denotes that the process from the disaster event towards resilience goes through a series of actions. This is contrary to Boshier and Chmutina's view that disaster risk management is a stand-alone process to ensure disaster mitigation and adaptation, and that disaster impact is not required to instigate the action. Experience has shown that most cities move towards disaster resiliency due to their disaster experience.



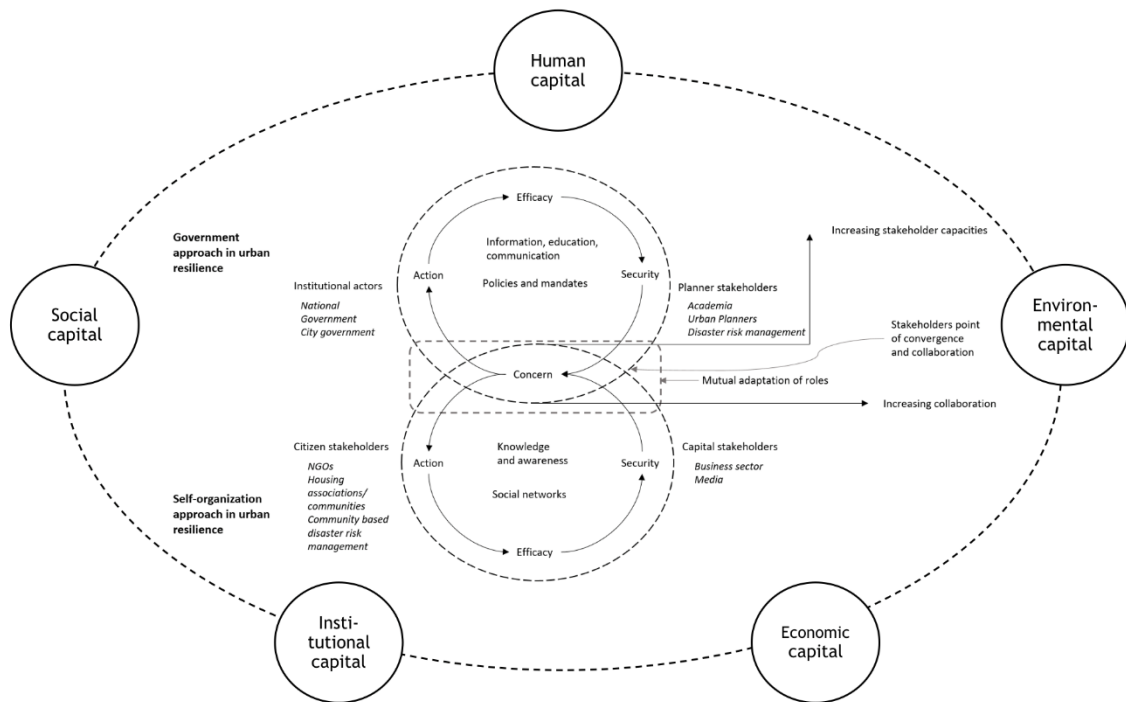
**Figure 2** The dynamic movement towards resilience from the disaster event (Source: Author, 2018).

Collective engagement goes through a series of four 'collective dimensions', following a hierarchy of adaptive cycles, shown in the Figure 2 with the panarchy symbol. Using the panarchy framework, which supports the socio-ecological systems framework, the collective dimensions are treated as part of a system to see the interaction and relationships of the variables within each dimension. Doing so helps in understanding the progression from one dimension to another. The panarchy framework goes through a series of adaptive cycles, which have four phases of development: exploitation/growth ( $r$ ); conservation ( $K$ ); creative destruction/release ( $\Omega$ ); and renewal or reorganisation ( $\alpha$ ). The two stages of panarchy start with the 'revolt' period from the  $\Omega$  destruction phase, leading to  $K$  conservation by a slow and lengthy process. The second stage is a sequence of rapid change, with shorter periods of innovation and reorganisation known as the 'remember' period. The second stage starts from the  $\alpha$  reorganisation phase, leading to  $r$  growth.

The transformation process starts with the collective concern of the stakeholders, which grows to collective action, collective efficacy and, finally, the collective security that all stakeholders enjoy in having a resilient city. It emanates from the disaster experience that stakeholders individually and collectively experience. Each dimension reflects the level of urban resilience in terms of the collaborative capacities of the stakeholders (institutional actors and non-institutional actors). These collaborative capacities may be in the partnerships formed between and among these stakeholders, which contribute to the shared vision and goals to achieve urban resilience. All stakeholders must be committed to support these efforts.

In the collective engagement urban resilience framework (Figure 3) stakeholders are the institutional actors, planners, capital and citizens. 'Institutional actors' refers to the government and those that hold government positions (elected or otherwise), with the legal mandate to plan, develop and implement city development programmes and projects. City planners work in the government, holding an assigned

government posting. As a category of stakeholders in the framework, ‘planners’ refers to technical people knowledgeable about urban management, disaster risk management and the resilient city, who may or may not be involved in the city development planning. These people can be found in the academic context or in private practice, and include scientists, urban planners, researchers, engineers and disaster management experts. ‘Capital’ refers to the business sector and media, and ‘citizens’ are housing associations, non-government organisations, community-based disaster risk management unit members and community associations/organisations. Given the three propositions set out above, collective engagement is assumed to be the sum of the individual engagement levels of various stakeholders that contribute to urban resilience.



**Figure 3** Collective engagement urban resilience framework (Source: Author, 2018).

The framework shows that the government and self-organisation approach to urban resilience can occur in two different ways, but each goes through the same collective dimensions. The five drivers of resilience – human, social, institutional, economic and environmental capitals – influence the overall approach towards urban resilience. The actions that emanate from the concern may follow different pathways on different timescales to reach a level of efficacy, but both converge on a level of security. The cycles form an infinity shape – similar to the panarchy framework – depicting a continuous process of change and stability. The framework in Figure 3 indicates the stakeholders involved in the overall process, but shows the main players for the two approaches. The dashed rectangle indicates the mutual adaptation of roles of all the stakeholders; the dashed circles indicate the increasing stakeholder capacities and increasing collaboration.

For each dimension, there are periods of stability and change that allow transformation to happen. According to Davies and Dart, the domains of change refer to four significant changes: changes in the quality of people’s lives, changes in the nature of people’s participation in development activities, changes in the sustainability of people’s organisations and activities, and any other changes.<sup>40</sup> These four significant changes have been used in evaluating international development programmes, using the ‘most significant change’ technique.<sup>41</sup>

The domains of change are present in each of the dimensions of collective engagement, and can be interpreted as the elements within the city’s adaptive cycles that result in the transformation from one dimension to another. The first dimension is *collective concern*. It is also where the first adaptive cycle



starts, and is triggered by the disaster experience of stakeholders. The revolt period in this dimension starts from the disaster experience ( $\Omega$ ), leading to the point when the stakeholders have reached a level of stability ( $K$ ) – for example, family and immediate network have recovered from the disaster. ‘Concern’ is defined as worry or interest; in this instance, ‘collective concern’ does not refer to worry, but rather to concern to address, organise and learn from disasters. When a disaster happens, stakeholders experience a sense of uncertainty, vulnerability, and concern. This begins with concern for one’s own well-being which then progresses to concern for others – from immediate family to the neighbours, and then the community, eventually escalating to the city. This collective concern is what brings the stakeholders together as a community. It is also the catalyst for action. In his study on social problems and collective behaviour, Blumer mentions that if a community does not perceive, address, discuss or take action on a social problem, then the problem is not there.<sup>42</sup> The disaster experience, together with the local and technological knowledge of the institutional actors, planners, capital and citizen stakeholders, is a point of interaction that triggers transformation. Once the disaster experience is recognised, accepted and endorsed by the stakeholders, they transcend to the next dimension. This recognition legitimises the problem, such that it requires action. Without this level of concern from the institutional actors in addressing disasters, resilience levels are not achievable. However, there are two approaches to building resilience: first, the approach taken by the institutional actors driven by governments and mostly taken together with planners, and second, the self-organisation taken by citizen stakeholders with some support from capital stakeholders. Collective concern is the pre-departure stage for these two approaches towards collective action.

The remember period starts in the second dimension. *Collective action* is spurred by the desire and need to work together as a network of stakeholders, which is the point of renewal or reorganisation ( $\alpha$ ). The role of networks and their linking ties are explored to ensure that the city learns from past experiences and transforms these learnings into actionable outcomes ( $r$ ). Meinzen-Dick and Di Gregorio define collective action as ‘the voluntary action taken by a group to achieve common interests’.<sup>43</sup> Collective action happens when there is a shared effort among stakeholders to achieve an outcome. However, if the stakeholders pursue short-term solutions and selfish interests, collective benefits or outcomes cannot be achieved.<sup>44</sup>

In this dimension, the exchange of information, knowledge and experiences help in creating solutions. It is driven by the networks maintained by the stakeholders as individuals and groups. Social networks help in facilitating the required action towards a given issue. Recognising and legitimising an issue or disaster, such as flooding, as an important priority area for city planning and development gives rise to collective action. The sense of community is much more evident in this dimension, where stakeholders with the help of their social networks cooperate to achieve a common agenda. It is within this dimension that mobilisation to take action is initiated, and thus self-organisation manifests. On the other hand, the action taken by the government-driven approach will be more policy-oriented and generally to the benefit all of the stakeholders. This can be in the form of creating policies, forming a disaster risk management unit, and providing information, education and communication campaigns to increase awareness and understanding about disaster risks and management.

The second adaptive cycle goes from the dimension of collective action to *collective efficacy*. The revolt period starts at the phase when the community through their social capital have collectively acted on the disturbance ( $\Omega$ ) and explores the linking ties with the government in effecting changes ( $K$ ). *Collective efficacy* lies with the stakeholders’ social cohesion, knowledge and information, and their willingness and ability to intervene to achieve a collective vision and goal for the common good.<sup>45</sup> Originating from Sampson et al.’s study on neighbourhood crimes,<sup>46</sup> collective efficacy is defined as the process of activating or converting social ties among neighbourhood residents in order to achieve collective goals. There is quite a thin line between collective action and collective efficacy. However, the research chooses to define collective efficacy as the point when and where all stakeholders (citizens, government, private and public sectors, civil society) come together, and emphasises active engagement. It conjures a task-specific construct that highlights shared expectation and mutual agreements of the stakeholders. It is the utmost exercise of ownership of the city, wherein stakeholders take part in the city’s transformation

process, not just during the onset of the disaster but even more so afterwards. More cohesive communities with higher social control are known to develop collective efficacy. This is not to say that the stakeholders should take it upon themselves to implement the transformation to a resilient city. This collective efficacy takes into account the stakeholders' engagement in the rebuilding and transformation process together with the local government. For instance, the authority and responsibility to implement flood risk management projects and infrastructures are with the government, yet it should be within everyone's knowledge that all stakeholders are accountable in managing these infrastructures whether directly or indirectly.

In this adaptive cycle, the remember period begins when the enabling environment in the city has improved in terms of disaster management. This means that policies are in place and implemented, and the economic capital of the city is stable and increasing ( $\alpha$ ). The  $r$  growth is when the stakeholders maintain the linkages and networks to continue improving their immediate community and the city as a whole. More cohesive communities with higher social control are known to develop collective efficacy. Aldrich found in his study that social capital, or 'the bonds which tie citizens together', proved to be the main engine of long-term recovery, rather than the aid provided by the government and aid agencies.<sup>47</sup> The study highlighted that higher levels of trust, civic engagement, and stronger social networks help communities bounce back after a crisis compared to fragmented, isolated communities.<sup>48</sup>

The government's role in this dimension is important to provide legitimacy and accountability<sup>49</sup> among stakeholders as political and implementing agents. Oduwaye further asserts that stakeholders are vital tools as advisers and presenters of planning information.<sup>50</sup> Collective efficacy is the result of having an empowered community that effectively takes action to improve their city, but also a government that has a strong enabling environment, and an economy that helps to propagate growth. This dimension is built on mutual trust and regular interaction that is accessible to a wider network.

The last of the four dimensions is *collective security*, which refers to the security against disasters that the city and its citizens collectively enjoy, brought about by the alliance and partnership efforts of the stakeholders and the city government. In this dimension, it is assumed that the government has the capacity to implement both structural (disaster-resilient infrastructures) and non-structural (training, education, policy support) measures to ensure resiliency. It is assumed that the city has undergone improvements in terms of its human, social, economic and institutional capitals, and is now capable of improving the physical capital of the city to ensure safety and security of stakeholders in case of disasters ( $\Omega$ ). The long period of revolt is the process of building structural measures and increasing the capacities of the stakeholders using non-structural measures. The level of security reached in this period ensures safety and security from disasters through infrastructures, but also through equipping the stakeholders with the knowledge about how to be prepared in the event of a disaster ( $K$ ). The remember period at this point goes back to review changes that have been made to improve the city's resiliency ( $\alpha$ ). The constant need to review and update structural and non-structural measures to address disasters, as well as improvements to enhance the human, social, economic, institutional and environmental capitals ( $r$ ) of the city are necessary to maintain a resilient city. The periods of 'revolt' and 'remember' display the interactions and back loop process. Opportunities for learning, adaptation and reorganisation happen during the release and renewal phases and emphasise that disturbance and change are part of the development process.

Collective security is the urban resilience level where stakeholders are disaster-risk aware. This means that stakeholders are well-informed and educated on disaster-risk management and can prepare and respond to disasters. Engagement of the stakeholders in discussing problems and solutions, and developing arrangements for urban management, help in pushing forward actions effectively, but a strong government that is open to collaborating with stakeholders, and has the necessary resources, leads to fully realising a resilient city. For instance, the authority and responsibility to implement flood-risk management projects and infrastructures are with the government, yet it should be within everyone's knowledge that all stakeholders are accountable in managing these infrastructures, whether directly or indirectly. Hall and Penning-Rowsell identified that:

modern flood risk management is people-focused. Considerable emphasis is now placed on stakeholder attitudes and aspirations, with government and state agencies alike seeking public engagement in the decisions that affect them, decisions that require behavioral change for effective

implementation (not something that is generally needed when tackling floods with concrete walls but that is needed when seeking an efficient public response to a flood warning).<sup>51</sup>

Information and knowledge are powerful tools to help stakeholders understand their role and responsibility in responding to floods, and in maintaining drainage systems. The government can provide the necessary infrastructure and social services, but remaining resilient is a collective effort. Collective security is achieved at the end of the process of transforming the city into a resilient city. But it does not end with the physical infrastructure alone. It goes hand in hand with the change in the behaviour of the stakeholders. When people realise and experience the benefits from the infrastructure, then their behaviour changes. Behaviour change is a continuous process, and information and education will be crucial in sustaining collective security and urban resilience.

## Conclusions

In summary, collective engagement is the coming together of different actors at different levels, working in various sectors and contributing to the functions of the city. It is the synergistic functioning of the city as an entire socio-ecological system that is able to adapt to disturbances or changes, including disaster events, yet maintain its function. Collective engagement means the awareness of all actors (government, citizens, private and public sector) of their responsibility and role in creating a resilient urban environment. Further, collective engagement is a continuous process of engagement among actors and adaptation to changes that inevitably lead to the improvement of the city.

The panarchy framework emphasises that resilience undergoes hierarchical adaptive cycles, which has also been highlighted in the collective dimensions. It shows that in building a resilient city, there is a continuous process of improvement. There is no closure, rather an ongoing process of recovery,<sup>52</sup> improvement and growth. The human, social, economic, institutional and physical capitals contribute to the city's ability to adapt, collaborate and organise. In creating resilient cities, it is important for governments and stakeholders to collaborate. This collective engagement in the planning and implementation of urban plans and disaster management plans increases their potential for success and sustainability.

Collective engagement is a continuous process of engagement, and the effectiveness of collective engagement to the overall attainment of a resilient city depends on three main elements. First, strong information and education on disaster management needs to be provided and accessible to all stakeholders. Second, there is a need for strong social networks of stakeholders that are collectively involved and tied to the city and its vision to become resilient. Last, the government and the stakeholders must understand the need to have a cohesive community in order to address disasters.

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## Declarations and Conflict of Interests

The author declares no conflict of interests with this work.

## Notes

<sup>1</sup> Meyer, *Social Capital and Collective Efficacy*.

<sup>2</sup> Arnstein, 'A Ladder of Citizen Participation'.

<sup>3</sup> Gunderson and Holling, *Panarchy*; Gall, *From Social Vulnerability*, 9.

<sup>4</sup> Gunderson and Holling, *Panarchy*.

<sup>5</sup> Gunderson and Holling, *Panarchy*.

- <sup>6</sup> Du Plessis, 'Understanding Cities'.
- <sup>7</sup> Gall, *From Social Vulnerability*, 9; Gunderson and Holling, *Panarchy*.
- <sup>8</sup> Walker et al., 'Resilience, Adaptability and Transformability', 7.
- <sup>9</sup> Folke et al., 'Resilience Thinking', 20.
- <sup>10</sup> Walker et al., 'Resilience, Adaptability and Transformability', 7.
- <sup>11</sup> Sharifi and Yamagata, 'Principles and Criteria'.
- <sup>12</sup> Goodwin, *Five Kinds of Capital*.
- <sup>13</sup> UNDRR, 'Terminology'.
- <sup>14</sup> Forum for the Future, 'The Five Capitals'.
- <sup>15</sup> Ilon and Kantini, 'Universities as Leaders', 145.
- <sup>16</sup> World Bank, 'Civic Engagement?'
- <sup>17</sup> Esteban, 'Collective Engagement', 221.
- <sup>18</sup> Bryson et al., 'Design and Implementation'; Ansell and Gash, 'Collaborative Governance'.
- <sup>19</sup> Bryson et al., 'Design and implementation'; Simo and Bies, 'Role of Nonprofits'.
- <sup>20</sup> McGuire, 'Collaborative Public Management', 33.
- <sup>21</sup> Ansell and Gash, 'Collaborative Governance'.
- <sup>22</sup> Bingham et al., 'Frameshifting'.
- <sup>23</sup> Kapucu et al., 'Collaborative Public Management', 50.
- <sup>24</sup> Kapucu et al., 'Collaborative Public Management', 58.
- <sup>25</sup> Kapucu et al., 'Collaborative Public Management'.
- <sup>26</sup> Ansell and Gash, 'Collaborative Governance', 544.
- <sup>27</sup> Emerson et al., 'An Integrative Framework', 2.
- <sup>28</sup> Ansell and Gash, 'Collaborative Governance'.
- <sup>29</sup> Esteban, 'Collective Engagement'.
- <sup>30</sup> Ostrom, 'A Behavioural Approach'.
- <sup>31</sup> Ostrom, 'A Behavioural Approach'; Esteban, 'Collective Engagement'; Ulibarri and Scott, 'Linking Network Structure'.
- <sup>32</sup> Ostrom, 'A Behavioural Approach'.
- <sup>33</sup> Wood et al., 'When Disaster Strikes', 149.
- <sup>34</sup> Wood, et al., 'When Disaster Strikes'.
- <sup>35</sup> Jahangiri et al., 'Comparative Study, 87.
- <sup>36</sup> Boshier and Chmutina, *Disaster Risk Reduction*.
- <sup>37</sup> Partanen, 'Indicators for Self-Organization Potential'; Nederhand et al., 'Self-Organization'.
- <sup>38</sup> Boshier and Chmutina, *Disaster Risk Reduction*.
- <sup>39</sup> O'Rourke, 'Critical Infrastructure', 26.
- <sup>40</sup> Davies and Dart, *The 'Most Significant Change'*.
- <sup>41</sup> Davies and Dart, *The 'Most Significant Change'*; Few et al., *Contribution to Change*; Esteban, *Philippines Typhoon Appeal*.
- <sup>42</sup> Blumer, 'Social Problems'.
- <sup>43</sup> Meinzen-Dick and Di Gregorio, *Collective Action*, 1.
- <sup>44</sup> Ostrom, *Understanding Collective Action*.
- <sup>45</sup> Sampson, 'When Disaster Strikes'.
- <sup>46</sup> Sampson et al., 'Neighbourhoods and Violent Crime'.
- <sup>47</sup> Aldrich, 'Social Capital'.
- <sup>48</sup> Aldrich, 'Social Capital'.
- <sup>49</sup> Ahmed et al., *Collective Action*.
- <sup>50</sup> Oduwaye, 'Citizenship Participation'.
- <sup>51</sup> Hall and Penning-Rowsell, 'Setting the Scene', 12.
- <sup>52</sup> Vale and Campanella, *The Resilient City*.

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