



COMMUNITIES AND CRITICAL INFRASTRUCTURE: OPPORTUNITIES FOR REINFORCING RESILIENCE

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Communities and Critical Infrastructure: Opportunities for Reinforcing Resilience

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Executive Summary

Community resilience has entered the policy arena to link empowerment and accountability. Building community resilience harks back to human security objectives – protecting and empowering communities and essentially enabling them to reduce the negative impact of both environmental and socio-political challenges on their lives, livelihoods and dignity. Yet there remain hurdles to turning these policy statements into action. The challenges faced across the Asia-Pacific are most pronounced in the wake of natural disasters and armed conflicts.

Critical infrastructure (such as public utilities, transport, water and health systems) serve as the “hardware” that supports the social resilience of communities. Sustainable public transport, flood and drainage management contribute to environmental security while infrastructure dedicated to urban renewal and upgrading as well as community market facilitates economic security. Infrastructure and services for supplying drinking water, sanitation and solid waste management supports health security goals. Street lighting and storm shelters help ensure personal security on a daily basis and in times of disasters. However, the provision of such infrastructure in many developing countries is often concentrated in affluent metropolitan areas and tends to have limited benefits for poor and vulnerable urban communities in terms of improving their quality of life. Moreover, when natural disasters or

armed conflict threaten the safety of families and communities, the poor become more vulnerable and in effect, disproportionately affected – to the point of losing the foundation of their lives and source of livelihood. Amid vulnerabilities to climate change and internal socio-political challenges, achieving equity among urban communities thus presents a vital challenge to many city governments in Southeast Asia.

Many developing countries in the region may lose gains achieved with the Millennium Development Goals (MDGs) if communities miss out on building and reinforcing their capacity to contribute to their own long-term development. Communities benefit more when affected individuals and households, who are their own first responders, however informal and unrecognised, are organised enough to immediately act towards disaster recovery and relief efforts without having to wait on government assistance. Governments however should not be lax and rely on the social resilience that communities may have. As in any natural disaster, response needs to be coordinated and when there is no clear line of command and control, efforts at the community level usually go to waste because of lack of a holistic approach. Embedded social resilience however needs to be reinforced with continuous and sustainable building of technical and organising capacities that are necessary for the long run in supporting development initiatives.

This issues brief includes several policy recommendations:

For disaster resilience

- Government and international humanitarian organisations or non-government organisations (NGOs) should conduct more technical and capacity-building programs to arm communities with adequate knowledge and training to address problems that may arise in a crisis or disaster. This can range from disaster monitoring to risk communication to first aid training.
- Emergency transport infrastructure: In disaster-related disruptions of the regular operations of public transport, local and national governments, as well as businesses need to have an emergency response plan buttressed with regular simulation exercises that are coordinated with communities and prepare to provide alternative modes of transportation (non-motorised transport, i.e., pedicabs, boats, trucks) to affected communities.
- Public-private-community partnerships. Private sector entities that have concessions on public utilities need to establish partnerships with local governments and provide technical training within community organisations to: (1) empower communities to maintain and protect the infrastructure for public utilities; (2) reduce service fees by reducing operational costs and; (3) ensure that public utilities remain operational during emergencies or disasters; To reduce the financial burden on the poor accessing privatised public utilities, governments at a minimum, should impose controls and regulate costs for services through a regulatory board.
- Crowdsource as much as possible. Technology companies should support crowdsourcing in and by communities. If properly utilised and managed, crowdsourced data can enable public utilities and transport systems to adjust to disruptions and easily provide both responders and the communities with the necessary response and information, such as evacuation and relocation procedures before, during and in the aftermath of disasters.

For sustainable development

- Participatory housing and urban planning: Governments and local authorities should involve households and communities in the planning process of public housing and relocating communities at-risk through enabling for the establishment of community organisations that can facilitate meaningful and credible public consultations imperative in urban planning.
- National governments or multilateral financial institutions can seed revolving community financing mechanisms through encouraging community cooperatives and community organisations that can serve as channels for urban poor households to not only secure land but also improve their living conditions through enabling access to public utilities, water and sanitation, transport, livelihood and health services.
- Governments seeking to boost a city's competitiveness and resilience need to invest in networked transport systems and the hubs created by designing different modes of transport – bus, train or taxi companies that are connected, regulated and organised. In addition to building the necessary technical expertise, city governments need a central agency that promotes, coordinates and regulates different modes of sustainable public transport.
- Governments must implement public information campaigns to communicate risk and raise awareness about climate change mitigation and adaptation to the general public through the cooperation of formal education and informal education systems. Educating the public about climate change and the need to adapt to climate change, for example needs to be an exercise of communicating science in simple terms to encourage a change in behaviour in communities.

Disaster and Crisis Resilience: Reinforce Community Capacities

When local communities are not equipped with the necessary knowledge and skills for disaster risk reduction, effectively communicating the risk to them and building awareness is crucial for helping them understand the need for and contribute local knowledge for disaster monitoring and systems for evaluating disaster response. Where necessary, technical and capacity-building programs can be conducted as a partnership between the government and international humanitarian organisations or non-government organisations (NGOs) to arm communities with adequate knowledge and training to address problems that may arise in a crisis. An enabling political environment and the necessary legal mechanisms can pave the way for long-term initiatives to take root. Moreover, including community members in these processes through technology-based platforms like social media can enable community leaders and other organisations to properly identify and assess who are at-risk.

In circumstances of limited disaster governance and when many public utilities have been privatised or are in public-private partnerships, technology companies are valuable in creating information systems for these public utilities. Rapidly urbanising cities in Indonesia, prone to earthquakes, volcanic eruptions and sea-level rise are slowly incorporating geographic information systems (GIS), global positioning systems (GPS), short message systems (SMS) and social media platforms (e.g., facebook, twitter), volcano warning systems and database mining utilised by technology companies to both gather from, and provide relevant information to communities through crowdsourcing. The use of mobile crowdsourcing and open data programs like Google Earth, OpenStreetMaps, and collaborative projects such as GeoNode, InaSAFE and the Open Cities Project, should thus be harnessed by governments not only to improve information dissemination and risk communication during

disasters but also to map at-risk locations to aid in urban and regional planning. With the increasing ubiquity of mobile technology that has become a basic necessity even in poor communities, disruptions in critical infrastructure, especially in transport and public utilities and services can be better managed with the use of crowdsourcing. Crowdsourcing by communities, if properly utilised can enable these systems to adjust to disruptions and easily provide both responders and the communities with the necessary response and information such as evacuation and relocation procedures before, during and in the aftermath of disasters.

Moreover, there is a greater need to acknowledge the significant role played by civil society groups and informal sectors in supporting community resilience when public utilities and services such as water and electricity are disrupted during disasters. Studies² on the informal sector - comprising mostly of the urban poor - demonstrate how they have made significant contributions to urban disaster recovery, acting as invisible hands and more often in the absence of support from the government or the private sector. Informal cooperative arrangements between local communities and the private sector are also significant when there is a lack of government assistance. As they are the most affected in times of disasters, the urban poor tend to be more resourceful especially when they pool their skills and resources to faster recovery as shown in the case of Mumbai during and after the 2005 floods as well as in the Bangkok floods in 2011. For example, households in slum communities in Bangkok during the monsoon floods were more capable of organising themselves to receive assistance and relief than the households in gated communities, and even contributed their time and resources to relief efforts.

² Sofiah Jamil and Gianna Gayle Amul, Community resilience and critical urban infrastructure: Where adaptive capacities meet vulnerabilities, NTS Insight, no. IN13-07 (Singapore: RSIS Centre for Non-Traditional Security (NTS) Studies, 2013); Sofiah Jamil, Connecting the dots: The urban informal sector and climate vulnerabilities in Southeast Asia's megacities, NTS Alert no.AL13-01 (Singapore: RSIS Centre for Non-Traditional Security (NTS) Studies, 2013); D. Parthasarathy, Rural, Urban and Regional: Re-spatializing Capital and Politics in India in Tim Bunnell, D. Parthasarathy and Eric C. Thompson (eds.) *Cleavage, Connection and Conflict in Rural, Urban and Contemporary Asia* (Dordrecht: Springer Science+Business Media, 2013)

With time and resources difficult to get hold of without a proper emergency stockpile, transportation during disasters is doubly critical. During complex humanitarian emergencies, public transport becomes less accessible, unsafe and insecure not only because of disrupted operations but also because of damaged infrastructure, lack or zero supply of electricity or gasoline for vehicles and the small number of public transport operators. In many of the flood-prone metropolitan areas in Southeast Asia like Bangkok, Manila and Jakarta, non-motorised transport, such as rickshaws (pedicab), are often used as alternative means of transport to provide emergency transport services and to transport supplies and relief during floods. Given advances in transport technology, governments along with willing and credible partners in the private sector need to develop alternative modes of transport that use renewable sources of energy such as solar, electric or hybrid vehicles and construct transport infrastructure that allows use of non-motorised urban transport such as bicycles.

In disaster-related disruptions of the regular operations of public transport, local and national governments, as well as businesses need to have an emergency response plan that is coordinated with communities and prepare to provide alternative modes of transportation (non-motorised transport, i.e., pedicabs, boats, trucks) to affected communities. Simulation exercises are useful not only in terms of building the capacity of communities in preparation for disaster response but also in raising awareness of the challenges and risks during disasters or crisis. Such contingency measures will allow for the safe movement of people to secure locations, for transporting emergency response teams and for delivery of humanitarian relief.

Healthcare services would be among the critical components of any humanitarian relief operation. However, health systems are heavily compromised during conflict and disaster situations. Not only would health-related infrastructure such as access to clean water and electricity be often damaged or lost, but the number of ready and able health workers may also dwindle to a minimum or none at all. A public health crisis (i.e. SARS, H1N1) puts

severe stress on a country's health infrastructure that surveillance systems will be overwhelmed and people will panic if bombarded by information. This problem is exacerbated when there is no definite structure in charge of coordinating an appropriate and effective response. Thus, a centralised coordinating agency is critical for public health systems especially in risk communication.

Public health emergencies are further exacerbated when external humanitarian assistance is unable to access disasters within conflict zones, where the safety and security of the health workers can be endangered and compromised – as seen from the experiences of the International Committee of the Red Cross (ICRC) in conflict zones such as Afghanistan. As a result, access and quality of healthcare services will be at its lowest in these situations and humanitarian and relief workers acknowledge the fact that they can only do their best in minimising deaths and the physical and psychological trauma to survivors. As such, there is a need to acknowledge that communities usually are prepared to fend for themselves in the interim before external assistance, aid or relief arrives.

In minimising the breakdown of health systems, humanitarian organisations with strong local networks play an essential role in facilitating assistance. Where available, governments have to make use of existing networks, whether these are based on religion, formal political associations or humanitarian interests. These networks need not be in competition for resources with governments but instead serve to complement the gaps in disaster governance if response can be properly coordinated. Such networks currently exist in Indonesia, in which one of the country's oldest faith-based organisations has been able to provide critical and immediate humanitarian relief through its own disaster management centre. Part of their success is attributed to the organisation's existing internal capacities of providing education and health services in Indonesia. As such, the organisation is able to rapidly mobilise its network of health care professionals in hospitals and clinics as well as volunteers from its own universities throughout the country without the web of bureaucracy that usually hampers disaster response.

Reduce Vulnerabilities through Sustainable Development

Effective cooperation towards sustainable development is mainly hindered by maintaining the interest of various stakeholders involved. This is particularly the case when ensuring continuity across different government administrations over time and sustaining the political will of elected government officials in continuing and sustaining the effective programmes of their predecessors. With these political impediments, there is an increased possibility that stakeholders such as the private sector and multilateral financial institutions will be more likely to work within their own networks. Thus, governments need to encourage and legally enable the establishment of community organisations that can facilitate more meaningful and productive consultations among stakeholders if properly leveraged towards objectives that benefit the communities first and foremost. Community organisations would also be effective channels to promote the establishment of community networks in metropolitan areas which can be mobilised not only during disasters but also for more long-term adaptive initiatives such as sanitation, sustainable community health services and social protection. Community-driven housing initiatives for instance are necessary for building resilience, whether supported by a national or local government or by non-governmental organisations. Enabling communities themselves to propose their own solutions from the start, with one initiative in the Philippines, providing technical assistance to develop relocation solutions and look for safer settlements, which are less vulnerable and in less hazardous locations in Metro Manila. It may be time consuming but governments and local authorities should involve households and communities in the planning process of public housing and relocating communities at-risk through transparent public consultations to avoid a top-down process where local or national authorities or technical experts merely dictate where and why they will move. Political and technical guidance are necessary but should be supported by local knowledge and guided by local needs.

While this would be an ideal arrangement for community participation, other stakeholders, however, may have different interpretations of what counts as community participation. While NGOs may perceive it as local communities having the liberty to decide how initiatives are implemented, community

members may not have the required capacities to engage with bigger or higher-level stakeholders. For instance, while there is an availability of funding amongst inter-governmental organisations for sustainable development initiatives, smaller NGOs need to increase their capacities to meet certain criteria before such engagement/cooperation can proceed. Moreover, given the difference in capacities of these various stakeholders, they also would have different levels of resources, reaction times and expectations of impacts. For example, while donors and the Asian Development Bank may have strong financial resources, these actors take a longer time to react to address issues at the local level. This is in contrast to NGOs who may lack financial resources but are able to mobilise quicker at the local level. These differences in capacities and expectation thus can result in difficulty in coordination.

This dilemma becomes a good rationale for community financing in Thailand which offered slum communities flexible financing mechanisms to secure land, access infrastructure and public services. Such financing mechanisms enabled the development of community funds and encouraged them to adapt financial management strategies for the benefit of their own cooperatives. Governments in the developing ASEAN countries need to provide the political and legal enabling environment for such community cooperatives and community financing schemes. With the programme's main thrust of slum upgrading that secured land for communities, urban poor communities were able to access basic services such as water and electricity and developed a sense of ownership among the households. Such value for ownership encouraged the residents' collective spirit and a sense of belonging. The sense of being provided social welfare and a perceived advancement in their socio-economic status motivated households and communities to organise themselves which increasingly helped them in their negotiations and interactions with city and development authorities. Such social capital also played a part in the decentralised but quick response of urban poor community networks in disaster relief and recovery during the monsoon floods in 2011 under the National Union of Low Income Community Organizations (NULICO)³.

Aside from community financing, another component of this enabling process is involving communities in spatial planning especially in coastal areas and other at-risk areas, where communities and policymakers should be made more aware of the need for continuous monitoring of the physical development of these areas. Advocates of these community driven initiatives note that communities themselves should see the grounds for preventing the further development of vulnerable areas and exposing residents to unnecessary and avoidable risks in the future, given the impact of sea-level rise in coastal urban areas. Communities should see for themselves the incentive to relocate, but also be aware of the need to balance their freedom to choose to stay or to relocate and their freedom from natural hazards. Such choices are influenced mainly by accessibility to livelihood opportunities and public services which raises the issue of transportation and mobility. Many public transport systems in developing countries in the region are unsafe and unreliable owing to the seeming lack of comprehensive planning to network transport systems.⁴ Aside from being overburdened beyond capacity, public transport infrastructure is not built to be universally accessible which puts additional burden on people with disabilities and special needs and ageing populations. Governments seeking to boost a city's competitiveness and resilience needs to invest in networked transport systems and the hubs created by designing different modes of transport – bus, train or taxi companies that are connected, regulated and organised. In most of Southeast Asia's cities, the expertise to engage in such an intensive process of urban planning is still lacking. It is thus important for governments to invest in building the capacities of both individuals (i.e., technicians, engineers, planners) and institutions involved in providing public transport services.⁵ Aside from the building the technical expertise, city governments need a central agency that promotes, coordinates

and regulates different modes of sustainable public transport.

Despite the notion of costly interventions to improve the transport sector, the cost to build universally accessible and adaptive modes of transport and related public infrastructure is minimal – as long as there is long-term and efficient planning. Such planning however requires buy in from the private sector which is increasingly a valuable stakeholder in terms of both providing public transport infrastructure and delivering services. This is mostly evident in many public-private partnerships in Southeast Asia, where build-operate-transfer (BOT) schemes are becoming the norm.⁶ However, instead of bringing the private sector into the process at the implementation stage, engaging them in public consultations along with affected communities before projects are even implemented could help encourage more fruitful collaborations that are not based merely on profit.

Implementing public information campaigns to communicate risk and raise awareness appropriate for a specific risk or issue to the general public is a must for policymakers. Educating the public about climate change and the need to adapt to climate change, for example needs to be an exercise of communicating science in simple terms to encourage a change in behaviour in communities. In terms of communicating risks and policies with long-term implications, there is a need for better articulation of intentions and values rather than with technical terms. For instance, promoting LED (light-emitting diodes) street lighting as a means of ensuring public and personal safety would be more viable and acceptable to communities, rather than promoting it merely as a way to increase energy efficiency. Thus, awareness and change in behaviour at the household and community level can make way for more efforts that can lead to more initiatives towards sustainable development at a broader scale.

³ NULICO also manages a revolving city-wide disaster fund for shelters which can further strengthen community ties and develop a social system for the development of the lives of the urban poor.

⁴ Singapore is an exception in the region in this regard although Thailand is slowly following suit.

⁵ In rapidly urbanising cities in the region, evolving into more intelligent transportation systems would involve not only technology companies but also the participation of experts to develop from a system with *static* service provisions and *passive* traveller information to a more *adaptive* system with demand-driven service and *active* travel advisories. Such collaborations exist between Singapore universities (e.g. Singapore University of Technology and Design) and relevant government ministries.

⁶ Nutavoot Pongsiri, Public-Private Partnerships and Urban Infrastructure Development in Southeast Asia in Yap Kioe Sheng and Moe Thuzar (eds.), *Urbanization in Southeast Asia: Issues and Impacts* (Singapore: Institute of Southeast Asian Studies, 2012)

Conclusion

There are best practices and models that develop practical solutions from local knowledge into urban community responses to housing, transportation, public utilities or health, which have been multiplying over the years. While the range of existing bottom-up initiatives to address community needs is commendable, there are concerns that too many initiatives may result in the possibility of duplication and wasted resources. In this regard, this issues brief suggests that a mapping of existing public programmes, private sector-driven initiatives or NGO-driven initiatives within the region⁷ will be useful to take stock of what has been done, and to better direct donors and intended beneficiaries to specific and relevant resources – whether for financial, technical or organisational support for communities.

About the Centre for NTS Studies

The Centre for Non-Traditional Security (NTS) Studies based in the S. Rajaratnam School of International Studies (RSIS) was inaugurated on 6 May 2008. It maintains research in the fields of Climate Change, Resilience and Sustainable Development; Energy Security; Food Security; Health Security; Water Security; and Peace, Human Security and Development. It produces policy-relevant analyses aimed at furthering awareness and building capacity to address NTS issues and challenges in the Asia-Pacific region and beyond. The Centre also provides a platform for scholars and policymakers within and outside Asia to discuss and analyse NTS issues in the region.

The Centre is the Coordinator of the ASEAN-Canada Research Partnership (2012–2015) supported by the International Development Research Centre (IDRC), Canada. It also serves as the Secretariat of the initiative. In 2009, the Centre was chosen by the MacArthur Foundation as a lead institution for its three-year Asia Security Initiative (2009–2012), to develop policy research capacity and recommend policies on critical security challenges facing the Asia-Pacific. It is also a founding member of and the Secretariat for the Consortium of Non-Traditional Security (NTS) Studies in Asia.

More information on the Centre can be found at www.rsis.edu.sg/research/nts/.

About RSIS

The S. Rajaratnam School of International Studies (RSIS) is a professional graduate school of international affairs at the Nanyang Technological University, Singapore. RSIS' mission is to develop a community of scholars and policy analysts at the forefront of security studies and international affairs. Its core functions are research, graduate education and networking. It produces cutting-edge research on Asia Pacific Security, Multilateralism and Regionalism, Conflict Studies, Non-Traditional Security, International Political Economy, and Country and Region Studies. RSIS' activities are aimed at assisting policymakers to develop comprehensive approaches to strategic thinking on issues related to security and stability in the Asia Pacific.

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⁷ As part of ASEAN community building, community resilience is at the heart of the ASEAN agenda, where regional economic growth and development is a means of enhancing economic resilience in the Southeast Asian region. Specifically, the ASEAN Socio-Cultural Community (ASCC) blueprint includes frameworks essential to enhancing community resilience such as disaster management, but is to date the most difficult blueprint to advance. ASEAN can therefore be a potential mechanism for stakeholders in the region to approach dialogue partners for assistance or collaboration on community resilience and human security, which would feed into discussions at the official bilateral level.

