

Smart villages and resilience to natural disasters

John Holmes

Abstract

A workshop on “Smart Villages and Resilience to Natural Disasters” was held in Singapore on 5 May 2016. The workshop was co-hosted by the Smart Villages Initiative and the Asia Research Institute, National University of Singapore. It brought together 44 participants from two communities of researchers: those focusing on energy access, and those focusing on resilience to natural disasters.



In smart villages, energy access together with other key components of infrastructure can accelerate the development of education and healthcare services, provision of clean water and sanitation, availability of nutritious food, and the establishment of productive enterprises. Underpinned by technological advances, such developments provide substantial improvements in well-being and life opportunities, and a choice between remaining in rural communities and migrating to cities.

Being “smart” should also increase the resilience of villages to natural disasters*. But does it, and if so, for whom and in what circumstances? To answer these questions, members of the resilience and energy access communities came together at the Asia Research Institute, National University of Singapore on 5 May 2016 in a workshop to explore the causes of vulnerabilities of rural communities to natural disasters and the mechanisms through which smart villages can build resilience. This policy brief distils key findings from the workshop and accompanies the more detailed workshop report.

In smart villages, resilience at a general level is accumulated through progressing from a hand-to-mouth existence, to a life that allows the accumulation of assets and savings which can support villagers in the immediate aftermath of a disaster and enable lives and communities subsequently to be re-built. Smart villages also undertake a stewardship role for their local environment which can help minimise vulnerabilities to natural disasters such as droughts (for example, through effective forest management) and storms (for example, for coastal communities, by preserving of mangrove forests).

With regard to the physical infrastructure of a village, energy access along with, and as an enabler of, modern information and communication technologies can improve resilience through:

- Providing opportunities for training and education at the village level, and the sharing of information, and hence the creation of skills and knowledge in villages on developing resilient infrastructure
- Facilitating communication links and providing the means for advance warnings of natural disasters as well as enabling more effective disaster relief efforts
- Improving health facilities and providing lighting, which can help rural communities during post-disaster periods

To be effective in the event of a natural disaster, energy and communication systems together with other key infrastructural components such as roads and drainage systems need to be designed to be robust to anticipated events. Depending on the nature of the threat, infrastructure may appropriately include a disaster shelter and village notice board. Attention should be given to the maintenance of infrastructure, not just its construction.

The social capital of a village is just as important as its physical infrastructure in building resilience. Communities that are empowered and competent in respect of building resilience, and that have the ability to come together to address problems in times of adversity, are more likely to withstand and recover from natural disasters. Such

“The social capital of a village is just as important as its physical infrastructure in building resilience”

capacities depend on culture and circumstances, for example, migration can undermine social coherence.

Initiatives to build community resilience should involve villagers as equal partners, not just as recipients of knowledge and physical capital. Sufficient time needs to be taken to understand community protocols, and community governance structures should be respected. If listened to, villagers will in turn be more likely to listen to “experts”, who should appreciate that local traditional knowledge can make an important contribution to increasing resilience (villages have in many cases had the adaptability and resilience to exist for many centuries).

Resilience should be part of everyday social discourse, and responses to relatively frequent, low-level disturbances can help build the capacity to build resilience to less frequent major events. There is value in initiatives to promote learning between regions, and to support the exchange of villagers’ study teams to enable village-to-village learning. In advance of natural disasters, resources and vulnerabilities may usefully be mapped, and this information shared with communities. Individual villages need to be seen as part of a wider system with interconnected risks, in which actions to mitigate risks in one part

of the system can have unintended consequences elsewhere. Diversity in the economy and of population centres, from villages through towns to cities with appropriate linkages, may enhance resilience. The “sister village” concept in which villages are twinned, providing for social interchange and a welcoming place to move to temporarily in the event of a natural disaster, is a potentially attractive approach.

The path to resilience is not linear: new vulnerabilities and opportunities may be generated by a wide range of factors. The devil is often in the detail. An integrated approach to policymaking is necessary to reduce the potential for unintended consequences of initiatives: all stakeholders need to work together. The finite length of projects to build resilience can be problematic in respect of the longer term sustainability of the measures introduced to villages. Sustainable business models and/or prior arrangements for handover to government institutions may be appropriate responses. Given the need to scale up from projects in individual villages to many hundreds of thousands of villages, there is a tension between standardised approaches and responding to the unique circumstances of each community.

It was recognised that there has been rather limited interaction between the energy access and resilience communities to date and that a number of research questions remain including:

- What is the relationship between energy access, poverty, and disaster resilience, and what causal connections, if any, exist?
- How can energy access and technologies improve resilience and efficiency in disaster affected agricultural communities?
- What are the different experiences and potential contributions of men and women in respect of energy access and resilience?
- What is the link between psychological trauma and responses to disasters?

* The term “natural disasters” is used to denote events, triggered by natural hazards, that have major deleterious impacts on people. Such natural hazards may be weather related (for example, cyclones/hurricanes, floods and droughts), or geophysical (for example, earthquakes, tsunamis, volcanic eruptions and landslides). It is recognised that the extent to which a disaster triggered by a natural hazard results in harmful effects to people depends not only on the scale of the natural event but also on the wide range of social, cultural and economic factors which constitute the affected population’s circumstances.

Notes

The Smart Villages Initiative

We aim to provide policymakers, donors, and development agencies concerned with rural energy access with new insights on the real barriers to energy access in villages in developing countries—technological, financial and political—and how they can be overcome. We have chosen to focus on remote off-grid villages, where local solutions (home- or institution-based systems and mini-grids) are both more realistic and cheaper than national grid extension. Our concern is to ensure that energy access results in development and the creation of ‘smart villages’ in which many of the benefits of life in modern societies are available to rural communities.

www.e4sv.org | info@e4sv.org | [@e4SmartVillages](https://twitter.com/e4SmartVillages)

CMEDT – Smart Villages Initiative, c/o Trinity College, Cambridge, CB2 1TQ

© Smart Villages 2016

The Smart Villages initiative is being funded by the Cambridge Malaysian Education and Development Trust (CMEDT) and through a grant from the Templeton World Charity Foundation (TWCF). The opinions expressed in this publication are those of the authors and do not necessarily reflect the views of the Cambridge Malaysian Education and Development Trust or the Templeton World Charity Foundation.

This publication may be reproduced in part or in full for educational or other non-commercial purposes.

The Asia Research Institute

The Asia Research Institute (ARI) was established as a university-level institute in July 2001 as one of the strategic initiatives of the National University of Singapore (NUS). The mission of the Institute is to provide a world-class focus and resource for research on the Asian region located at one of its communication hubs. ARI engages the humanities and social sciences broadly defined and especially interdisciplinary frontiers between and beyond disciplines. Through frequent provision of short-term research appointments it seeks to be a place of encounters between the region and the world. Within NUS it works particularly with the Faculties of Arts and Social Sciences Business Law and Design to support conferences lectures and graduate study at the highest level.