Crowdsourcing Community Resilience in Urban Slums

- Refined Problem Statement -

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Table of Contents

Links lead to sections within this document.

Overview

This document outlines the *Refined Problem Statement* for the **Crowdsourcing Community Resilience in Urban Slums** project, which was granted a Stage 2 award under the preliminary round of the Global Resilience Partnership Design Challenge in January 2015. For the *Problem Statement and Solution Design*, the team is basing its work in Dhaka, Bangladesh. In this urban setting, the team will explore how community crowdsourcing and open data can be used to improve information flows and local decision making on risk and resilience. The team comprises a diverse set of international and Dhaka-based individuals and organizations that have extensive knowledge and experience on community engagement, mapping, data and innovation, climate change, and entrepreneurship. The *Refined Problem Statement* is a further step toward outlining the team's *Solution Statement* to be finalized in July 2015.

List of Team Members

Resilience Team Lead Organization:

Robert Laprade, Regional Representative and Regional Director, **American Red Cross** (ARC), Asia, Middle East and Europe (AMEE) Region, based in Bangkok, Thailand. Mr. Laprade is supported by: team lead, **Alex Schein**, Regional Representative, Bangladesh and Nepal, based in Dhaka; **Ian O'Donnell**, Sr. Urban Planner, Global Disaster Preparedness Center, alternate lead and author, Problem Statement; **Maya Kapsokavadis,** Program Officer, AMEE, ARC, lead editor and author, Problem Statement. redcross.org; preparecenter.org

Resilience Team Members:

Hafiz Ahmed Mazumdar, Chairman, **Bangladesh Red Crescent Society**. bdrcs.org

B. V. Kumar Emani, Deputy Secretary General and Executive Director, South Asia Regional Office, **ICLEI - Local Governments for Sustainability**. ICLEI develops capacities and empowerment of local authorities at different scales, facilitates local government support, and replicates project outputs and learning. iclei.org

Dr. Alanna Simpson, Senior Disaster Risk Reduction Specialist, **World Bank's Global Facility for Disaster Reduction and Recovery (GFDRR)**. Dr. Simpson leads a team that includes Ms. Simone Balog, lead editor and author of Problem Statement. Her team supports the use of science, technology, and open data to empower decision makers to strengthen their resilience. gfdrr.org

Dr. Ananya Raihan, Ashoka Fellow, CEO, **Dnet**, a pioneer in using ICT, innovative research, and coalition-building for scaling and sustainability. Their two flagship and award-winning programs focus on empowering women. dnet.org.bd

Shadrock Roberts, Director, Resilience Network Initiative at **Ushahidi**, a groundbreaking initiative that changes the way information flows in the world while empowering people through innovative technology. ushahidi.org

Erica Hagen, co-founder, **Map Kibera** and **GroundTruth Initiative** that helps communities use digital media, mapping, and open data tools for greater influence and representation in development and democracy. mapkibera.org; groundtruth.in

Samuel Bretzfield, co-founder and CEO, **bGlobal Interactive.** Mr. Bretzfield is the founder of the first Bangladeshi wearable apps company**.** bringing emerging technology experience. bglobalinteractive.com;

Dr. Maarten Van Aalst, Director, Red Cross Red Crescent Climate Centre. The Centre bridges science, policy, and practice to address rising risks of climate change, including innovative use of games to better understand risk scenarios and options and forecast-based financing to increase funding available for preventive measures.climatecentre.org

Cities cover less than 1% of the world's surface area, but: house more than 50% of its population; use 75% of its energy; and account for 78% of carbon emissions. In urban areas, slums and informal settlements[1] are increasing in size—globally, by 2020, slum populations are projected to reach 889 million. Whether due to a lack of formal land tenure, 'proper' registration or citizenship, slum dwellers face common challenges in pursuing safe and healthy living environments and their vulnerability will be compounded by substandard living conditions, high exposure to natural elements and climate change, and fragile health.[2]

Repeated shocks to slum dwellers' livelihoods and well-being can erode their ability to do more than survive, ensnaring them in a vicious poverty trap. While cities are the primary engines of economic growth, they are also incubators of vulnerabilities; there, slums are characterized by an under-investment in infrastructure and services. Access to services and development opportunities are unequal, resulting in growing numbers of people exposed to shocks, stresses, and weakened coping strategies.

Slum dwellers face significant barriers to resilience that requires additional community and municipal support. Opportunities to organize local solutions at the neighborhood level are limited by uncertainty of land tenure, time and resources, and, in some slums, the transience of migrants. In urban settings, women and girls cope with myriad problems, e.g., carrying the burden of multiple roles in employment alongside conventional household responsibilities. Their reproductive health can be at high risk due to unhygienic living conditions and poor access to proper sanitation services. Women's health risks increase in settings where access to services is constrained and nearly two-thirds of health expenditures are paid out of pocket.[3] Other stressors affecting resilience include the tendency of Bangladeshi culture towards patriarchal social norms that depict women as docile and dependent, limiting outlets for women to voice and meet their individual needs, and women can be susceptible to physical, sexual, or psychological violence.

Nevertheless, many slum dwellers have found creative ways of organizing and adapting to these extreme conditions that are sometimes under-recognized due to a lack of self-representation in media and other information channels. Their resilience is broadly dependent on three key capacities: (1) the ability to organize and respond to threats or disruptions; (2) access to actionable resources; and (3) access to information—which is most likely to amplify resilience. Acknowledging this hypothesis, key questions this project will address include: (1) How can resilience information, and hazard and risk data be more actionable for slum dwellers as well as local actors who have roles in urban governance and decision making? (2) How can new tools for crowdsourcing, open data, and design thinking simplify and facilitate community organizing and expand existing coping capacities to address a wider range of collective resilience needs?

Information

Data and information are powerful tools. As the new Sendai Framework for Disaster Risk Reduction highlights, understanding risk is a precursor and catalyst to further action to reduce risk and strengthen resilience:[4]

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[1] Hereinafter, "slums" includes "informal settlements" and "slum dwellers" includes "informal settlers".
[2] UN-Habitat, *State of the World's Cities 2006 / 2007*.
[3] ADB, *Impact of Out-of-Pocket Expenditures on Families and Barriers to Use of Maternal and Child Health Services in Bangladesh*, 2012.
[4] Adopted in Sendai, Japan in March 2015.

Data → Information → Insight → Action

For slum dwellers, the digital divide is a daily reality driven by lack of access to:

1) Information tools, e.g., the internet, social media, data
2) Skills, e.g., basic computer literacy, advocacy methods
3) Places where new opportunities for development exist, e.g., tech hubs, innovation labs

Access to proprietary or relevant data can restrict opportunities for the effective use of information to enable better insight into disaster and climate risk. Despite improvements in assessing risks, risk literacy and awareness / knowledge of solutions to resilience remains low. Information is not shared in ways that facilitate locally-owned or data driven decision making. E.g., developing cities tend to lack publicly available, free, and open online maps—data that is critical to identifying risks and a central tenet of good disaster risk management practice. Development data is not usually multi-hazard; re-used in new projects; or shared with at-risk communities or other interested stakeholders (e.g., humanitarian / development actors who tend to work in isolation and produce siloed data). Data silos manifest for slum dwellers in two ways:

- *Data silos that affect slum dwellers:* Often existing data collection methodologies focus solely on extracting data from a community, without engaging them in the process, relationships, or technology, and with limited return of investment for the communities themselves in data outputs collected. Participatory processes, however, encourage ownership of the data and empower slum dwellers to better understand and have a stake in developing local solutions based on that information. Overall, this key change can influence how concepts of resilience are framed.
- *Data silos that affect institutional and governmental environments:* The lack of open data limits opportunities for agencies to benefit from shared data. E.g., data on school risks is rarely shared between humanitarian actors and ministries of education, even though relevant to both. Typical problems include availability but in unusable formats, or lacking integration in open data platforms. When access to and sharing of data is prioritized, data have become a strong tool for public advocacy and inter-agency collaboration.

Resources

Excluded from most formal governance processes, slum dwellers often lack influence over how local government budgets are used to address risk and enhance resilience (let alone have a say in the planning process). The concept of open data presents an opportunity to improve the measurement of risk. It also may be powerful enough to leverage investment in resilience and development opportunities alike in addition to linking public and private investment in resilience building. E.g., the commercial weather industry in the United States is built upon open government data provided by relevant public agencies, demonstrating the potential value that open data can provide.

Do-it-yourself (DIY) approaches will be encouraged to tap into local communities' capacity to self-organize. Data ownership by communities will be encouraged as a method of strengthening coping mechanisms and individual and household incentives will align with community actions to implement holistic, sustainable community solutions. Using crowdsourcing and open data, especially mapping data, to inform community design activities can bridge these gaps and

empower households and local communities to integrate a wider set of resilience measures into daily lives, budgets, and decision making.

Connectedness

The traditional definition of "community" doesn't fit in an urban slum context. Slums are the first stop in a vast rural-to-urban migration, necessitating new ways of building social cohesion and calls to action in cities, where 'communities of interest' are increasingly as important as geographic communities. Slum dwellers can feel they have limited purview to influence decision making, and formal governance structures are often incapable of delivering services to slums, limiting opportunities to take advantage of proactive risk reduction measures. Community mapping and crowdsourcing through activities like Map Kibera and Missing Maps can foster a sense of community, provide a canvas for capturing data and perspectives from diverse sub-communities living in the same neighborhoods, and engage wider sets of champions within city or national governments through advocacy for more inclusive decision making.

Unique Selling Point

The project's Unique Selling Point is its team, which includes a mixture of local, regional national, and international experts with a strong breadth of skills, knowledge, and experience on community engagement, mapping, data and innovation, climate change, and entrepreneurship. As articulated in the *List of Team Members*, above, each organization is uniquely suited for taking this project to scale through its connections to a wide network. Collectively, team members are also engaged in a range of other initiatives and programs with strong relevance to the Global Resilience Partnership. These include the World Bank's Urban Resilience Project and Open Cities Project, IFRC's One Billion Coalition, and 100 Resilient Cities to which both Ushahidi and ICLEI are contributing. These initiatives provide significant opportunities to leverage existing funds and activities in country, and to scale-up the project globally.

The global **RCRC** Movement has a network of over **17 million volunteers**. The Innovation Lab at the World Bank's GFDRR supports the use of science, technology, and open data to empower decision makers (often on policy issues at the national government level) in vulnerable countries. Smaller, technology-focused team members such as Ushahidi and GroundTruth Initiative have implemented innovative, community-led mapping and technology projects using cutting edge software, apps, and products. ICLEI works to develop the capacities and empowerment of local authorities, and can facilitate garnering government support, replicating project outputs, and learning. ARC founded the Missing Maps (built on Map Kibera) project to put the world's vulnerable people on the map by engaging remote and local volunteers globally.

Dnet is a pioneer in using ICT, innovative research, and coalition-building for scaling and sustainability. Dnet's two flagship programs: Apojon, a mobile phone based service for expectant and new mothers; and Infolady, a social entrepreneurship model that envisions women as community change agents. bGlobal Interactive brings a thorough understanding of emerging technology, business process outsourcing, interactive marketing, and new business startup from both client and vendor perspectives. The RCRC Climate Centre has considerable experience bridging science, policy, and practice to address the rising risks of climate change, including innovative use of games to better understand risk scenarios and options and forecast-based financing to increase funding available for preventive measures.

Theory of Change & Impact Pathway

At this stage of the challenge, the Theory of Change—the core of the project team's planned approach—is still being developed and refined. It will be significantly informed by the team's field visit to Dhaka in May 2015. The text below outlines preliminary thoughts on the model for the project's theory of change:

Current State:

- Latent community-level information is valuable for improving collaboration and cooperation on resilience measures.
- Useful information usually resides in various "data silos," and is frequently inaccessible to populations in need of information, in addition to interested stakeholders.
- The information may be unmanageable (e.g., specific / unusable formats), incomprehensible, or inadequate to allow for interpretation and use by the community or decision makers.

Targeted Populations:

1) Slum dwellers in Dhaka, Bangladesh
2) Decision makers at governmental level as well as non-governmental organizations

Targeted Outcomes and Long-Term Goals:

Outcome 1: *Improving access to risk information* for all stakeholders, with a particular focus on slum dwellers.

- Communities identify features of their community that should be made more "visible". This strategy may include mapping activities that are successful and sustainable in securing community buy-in and long-term ownership. The solution will examine ways to engage the public sector and market adoption to build momentum with a broad base of stakeholders.
- Communities manage the process of producing relevant data related to their resilience needs. Externally-produced data (e.g., from government and development agencies) will also be curated by communities and disseminate locally (e.g., through art, like public murals, relaying important disaster risk or behavior change information).
- Communities develop an advocacy strategy, along with supporting tools, built on actionable information (including "official" risk information) to present to local / city / national / international decision makers. Wherever possible, collected datasets will be made open and available and relevant vulnerability assessment data will be digitized.

Outcome 2: *Enhancing collective decision making* to develop local resilience solutions based on actionable risk information.

- Change agents, alongside elected officials, are engaged in hubs for collective decision making, or in supporting ongoing work of slum associations through online platforms and/or digital tools. Engagement of women in decision making activities will be critical for ensuring equal representation and that solutions are relevant to the broader community.
- Slum dwellers are supported to identify current strategies and innovations from either their neighborhood or other communities of practice to cope with, prepare for, and increase their resilience to destabilizing events.
- Codification and/or digitization of "local action plans" and advocacy strategies around key issues of risk (directed at key local / city / international decision makers).

Outcome 3: *Cross-learning and peer-sharing* to connect communities, drive scaling, and empower slum dwellers.

- Community associations host workshops and learning sessions (using different formats based on ongoing learning and adjustment of approach) to distribute information to other linked networks.
- Local stakeholders invited to share best practices for addressing barriers to resilience with government and development agencies to improve governance processes.
- Lessons learned can be replicated on a global scale through the Red Cross Red Crescent network of volunteers.

Outcome 4: *Strengthening communication channels and feedback loops* between decision makers and slum dwellers will create a process by which information can be used to advocate for policy shifts.

- Gaps in communication channels are identified to ensure that solutions are targeted and appropriate for the community.
- Diverse groups within the community are engaged and linked to one another to ensure communication systems are established and functioning.
- Reduction of data silos and improved data sharing between agencies and local communities.

Hypothesis:

Greater resilience derives from:

1) Increasing community access to information, creating networks for communication flows, and providing a feedback loop for information that directly influences local or national level governance and policy;
2) Sharing adaptive behaviors and ideas or innovations widely within and across slums, and with external stakeholders;
3) Empowering slum dwellers to use information to influence decision makers, advocate for rights, and inform and facilitate resource allocation; and
4) Sharing local solutions and knowledge.

Assumptions:

1) Slum dwellers have an interest in improving their situation by engaging in this intervention.
2) Slum dwellers are aware of issues they face.
3) Key stakeholders are willing to support or will not negatively interfere with a change agenda to improve the resilience of slum dwellers.
4) City government and other decision makers will be responsive and receptive to emerging community needs and views.
5) Slum dwellers will be comfortable with the technology used to share and collect information, either through training or prior experience.
6) Participatory mapping activities continue to be successful at empowering communities.

Logframe (Preliminary Draft):

Goal	Improved community resilience	
Purpose	Local resilience solutions identified based on collective decision making	

Outcomes	• Increased access to risk information by
	  ○ Communities
	  ○ Local governments
	• Increased participation in identification of risks by communities
	• Increased advocacy by communities to local governments
		• Increased collaboration among stakeholders
		• Increased information sharing
		• Increased use of information resources
		• Increased participation by women in use of risk information

Outputs	• Training sessions with community groups on risk data collection and use • Facilitated discussions with community groups to map information flows related to risk and resilience, including influences of gender on these flows	• Community mobilization to identify and prioritize risks and resilience strategies, especially to capture role of women in household and community action on resilience
Activities	*To be scoped during Solution Development activities*	
Inputs	• Financial resources • Project staff • Community organizations / groups / beneficiaries	• Local government organizations • Partner organizations • Existing mapping tools

Sample Impact Pathways - *This section outlines a sample of impact pathways illustrating the variety of ways that information flows enhanced in the project help shape community resilience solutions.*

Fire Risk

1) Community highlights as primary concern.
2) Mapping of recent fires, followed by identifying and reporting strengths in each instance (e.g., response by neighbors, process of receiving support post-event such as material help or child care).
3) Uploading this information on a digital platform, allowing others access.
4) New adaptive measures identified by community, e.g., fire prevention campaign and promotion of fire-safe cooking.
5) Local government is invited to support adaptive measures, e.g., through improved fire vehicle access.
6) Capture of data and issues in global platform, enabling reach with larger systems to channel broader action on community priorities and solutions.

Eviction and Homelessness Risk

1) Community highlights as primary concern.
2) Mapping of proposed eviction areas is combined with reporting challenges of those in pathway of eviction (especially female headed and other vulnerable households). Successes for any upgrading projects are documented.
3) Online presentation of detailed reports / maps, helping support negotiation process already in place between community members and government. Neutral documentation.
4) Adaptive measures: highlighting successful upgrades helps support their continued adoption. Clearer information about strengths of the community (mapped social infrastructure, resources) helps develop positive future vision.

Environmental and Social Safeguards

The following safeguards have been identified to reduce adverse risks and ensure feedback loops will provide mid-course opportunity for correction and fine-tuning:

Safeguard	Planned Action
Full and effective participation of relevant stakeholders	The planned activities are based on principles of public crowdsourcing and collected data will benefit from the inclusion of all interested stakeholders in targeted slums.
Free prior informed consent	Participants will be provided with background information and an opportunity to opt-in the project.
Full sharing of data collected	The project will adopt an open data policy, adhering to International Aid Transparency Initiative standards and reporting at granular levels through the Foreign Assistance Dashboard,[5] using the USAID privacy policy and Open Data Privacy Analysis Template as guidance.[6]
Respect for local knowledge and coping strategies	The primary intent of a crowdsourcing focus is to engage slum dwellers directly in collecting both risk data and resilience information to supplement existing data sources.
Protection and strengthening of environmental services	In the community design process, the team will work with local organizations and slum dwellers to conduct a holistic community analysis of risks.
Recourse / grievance mechanism	Project team will identify a local organization to serve as the liaison and channel for feedback about any of the proposed project activities.

[5] See http://www.aidtransparency.net and http://www.foreignassistance.gov for more information.

[6] See http://www.usaid.gov/sites/default/files/documents/1868/508.pdf and http://www.usaid.gov/ads/policy/500/508mah.

Risk Matrix and Mitigation

Risk	Potential Severity	Likelihood	Planned Mitigating Actions
Major weather-related events and/or disaster occur during project implementation phase.	High	Moderate / High	Communities made aware of risks and evacuation plans are put in place. Advocacy with local governments to cover needs.
Political or civil unrest, outbreaks of violence petty crimes, or new inhabitants disrupt community cohesion and implementation.	Moderate	Moderate	Design viable communication networks to provide slum dwellers with access to information regarding demonstrations, strikes, and public rallies.
Interruptions to the availability, engagement, or participation of Resilience team members.	Moderate	Low	Determine needs of key stakeholders; build local capacity to meet needs.
Owners of data are unwilling, uninterested, or unable to sharing datasets.	Moderate	Moderate	Pursue an open data approach relying on an appropriate data capture strategy and incorporating principles of open data into all requests for information.
Slum dwellers using information for rights advocacy are targeted by government / opposition party, or politically-minded groups.	High	Moderate / Low	Advocacy strategies will be pursued targeting national and local government stakeholders to promote any rights-based needs.
Information is seen as dangerous to publicize or access putting slum dwellers at risk. Data used for malicious purposes to target specific community members.	Medium	Low	Community groups must approve (by consensus) sensitive information before it is made available (e.g., eviction information). Local decision making takes priority.
Data privacy (e.g., personal information) is compromised.	Low	High	Open data will not include sensitive private / personally identifying information (i.e., household level data).
Slum dwellers are unable to overcome technology barriers (including access and skills development).	Low	Moderate	Activities use mixed methods approach (e.g., field papers alongside technological tools for data collection) while building redundant systems.
Connectivity is stable enough to allow for pilot interventions that incorporate more robust technological tools.	Moderate	High	Diverse stakeholders will be engaged to ensure that robust solutions are identified for any technology tools that will be utilized.

Measuring Resilience

At this preliminary stage, the complete solution that will be adopted by the project team is still being developed and refined. The solutions will be significantly informed by a team research visit to Dhaka during May 2015. Ultimately, the measuring approach and system that the project team will propose need to be specifically tailored to the finalized solution that will be presented in the Solution Statement and Phase 3 proposal. The text below outlines the team's initial thinking on measuring resilience.

The project will pursue a value for money approach by focusing on maximizing the impact of each dollar spent to improve lives of slum dwellers in Bangladesh. As the draft logframe illustrates (referenced above in the *Theory of Change & Impact Pathway* section), the project will work closely with local slum dwellers to increase the two-way flow of risk information to identify local solutions developing resilience through inclusive decision making processes. The approach for monitoring will be to ensure sound baseline data for each of the final logframe indicators are established within the first month of project implementation. Slum dwellers and Resilience team members will work hand-in-hand to collect data on logframe indicators mid-way through the project to validate and implement any necessary course corrections. Data on these same indicators will be collected at the conclusion of the project to be used as one source of evidence for the final project performance evaluation. Indicators will be designed to evaluate inclusiveness of the solutions among different population segments in the slums based on gender, ethnicity, age, status, and other relevant factors identified during the Solution Development phase.

While the final performance evaluation design will likely be refined in the Solution Statement, the team believes a before and after design utilizing mixed methods is most appropriate. Evaluation questions will number no more than five, and will focus on outcome-level results intended as project outputs. Unintended consequences—both positive and negative—as well as gender dynamics will also be explored. An external evaluator will lead the evaluation team and use key informant interviews, surveys, focus group discussions and analysis of all data produced or improved with project resources. The evidence produced by this evaluation will be used to inform and scale similar efforts throughout the Asia region.

To measure the efficiency of the planned approach, the project team will use a combination of quantitative and qualitative participatory approaches to cost benefit analysis to identify:

1) Return and knock-on effects from project investments;
2) Economies of scale (in terms of cost reductions and co-benefits) from the reduction of data silos and enhanced sharing of risk and resilience data between organizations;
3) Comparison of potential gains from alternate sequencing of planned project activities with an eye toward enhancing efficiency of the planned approach for future scaling;
4) Potential returns from project activities in relation to the probabilistic nature of disaster-induced events and other shocks; and
5) Distributional impacts and the equity of benefits across gender, income level, and status within targeted slum communities.