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Towards novel community-based collaborative disaster management approaches in the new information environment: an NGO perspective

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Abstract – Large-scale natural and man-made disasters are complex events involving many stakeholders. Despite the structures the national and international humanitarian systems provide, still many collaboration and information gaps between stakeholders, levels of operations and phases in the disaster management cycle occur. In the recovery phase, communities are insufficiently involved and comprehensive knowledge about the affected environment is missing leading to mismatches between efforts of the different actors and the community needs and prolonged recovery trajectories at higher costs. The rapidly changing and new information environment consisting of mobile services, social media, social networks, crowdsourcing and online communities offers new opportunities to engage with communities but also new challenges to stay abreast of all that's communicated digitally. New collaborative approaches will be required to diminish these gaps. The EU funded COBACORE develops a collaborative platform that facilitates the interaction between members of the professional, affected and responding communities. It helps to register needs, capacities, activities and acquire situational information by the whole, and provides facilities to obtain better matching of needs and capacities. Adoption and ownership by communities is essential and should be investigated for example by building and piloting a localized version of the platform. Such a localized platform should enable both digital and non-digital ways of interaction given that many disaster affected communities live in resource-poor environments. The platform can be used as well as a cooperative development game for the responding community and professionals to improve their cooperation and coordination skills. Although NGOs are not social computing organizations, it is recommended to expedite developing a basic social computing understanding (and possibly capability) in-house so that digital technologies can be incorporated into relief and recovery activities more easily.

Keywords – disaster recovery, new information environment, community-based, collaboration gaps

1. Introduction

Large-scale natural and man-made disasters are complex events affecting many societal, political, economic and environmental processes. Rebuilding a disaster-affected area and community to a safe and stable state in which it can regain its societal and economic livelihood (Crutchfield, 2013) is complex, let alone “building back better” as is often the credo. Many stakeholders are involved and include local communities, sometimes both responding and affected at the same time, local professionals (government, private sector, national and local NGOs) and the international community (UN, international NGOs (iNGOs), donors, the military, diplomats). These stakeholders

can select from a wide range of Political, Military, Economic, Social, Information, and Infrastructure related disaster management activities with often varying intentions and influence. To illustrate the wide spectrum, interventions can range from purely humanitarian response activities aimed at relieving human suffering to deliberate economic shock doctrines after disasters to serve external economic interests (Klein, 2008). Stakeholders are organized in principle by the government; they have the mandate and implement disaster laws, structures and procedures. In case of major disasters, such as level 3 disasters as declared by the Inter-Agency Standing Committee (IASC), the international humanitarian system with the cluster system comes into play with obviously still an im-

portant role for the government. Although both organizational structures are usually well-defined, in the execution still many flaws occur. First of all, a lack of leadership. On the one hand the -especially local- government has limited capacity and experience, does not invest much in preparedness and is as a consequence not able to take leadership. On the other hand clusters are dominated by the international NGOs, hampering the participation of local NGOs and causing sometimes insufficient information on local capacities to reach the clusters. Also sharing information between clusters is a challenge (van den Homberg, 2014). Furthermore, despite joint assessments such as the Multi-Cluster/Sector Initial Rapid Assessment (MIRA), comprehensive knowledge about the affected environment is still very hard to obtain. Communities are insufficiently involved whereas they should be considered as the most important stakeholders. Research has shown that they save most of the lives in the response phase (Bankoff, 2004) and that they also play a key role in recovery. If recovery is driven only by the responding external organizations, community resilience is weakened and recovery often fails (Quarantelli, 1999). This is also in line with the trend amongst western policy makers to focus on increasing citizen participation. The collaboration and information gaps between stakeholders, levels of operations and phases in the disaster management cycle as described above lead to mismatches between recovery efforts of the different actors and community needs and -as a consequence- to prolonged recovery trajectories at higher costs.

2. The NGO Perspective on Collaboration with Communities

Nearly all NGOs place affected communities at the heart of both their developmental and relief aid activities through their guiding principles and values. For example, the International Federation of the Red Cross has Humanity as their leading principle: the need to act in order to prevent and alleviate human suffering. Similarly, Caritas Internationalis and its 162 member organizations have Solidarity as a key principle, whereby the response to an emergency is an expression of solidarity with the people affected by a disaster (Caritas Internationalis, 2007). Caritas Internationalis has an additional principle that guides the interaction with communities, namely Subsidiarity. People have the right to participate in decisions that affect their lives and decisions should be made by the people closest to and most affected by the issues and concerns of the community. It means returning the rightful ownership of projects and development processes to local communities.

How can the professional NGO community implement these guiding principles in especially the response and recovery phase? To this end, nearly all iNGOs work by definition with local partner organizations such as the IFRC with the national society and the Caritas member organizations with the ecclesial network in the affected region. These capillary structures can be used to gain unique knowledge of and access to grass-root communities af-

ected by the emergency. Furthermore, through these local partner organizations, iNGOs can gain access to community buildings (such as schools and Church buildings), which can be used to provide essential emergency services to victims of a disaster and to personnel with considerable experience of working with grass-root communities such as Red Cross volunteers and Church representatives (varying from bishops, priests, religious sisters and brothers, missionaries up to lay people). However, reaching an optimal distribution of the work over the international, national and local NGOs has proven to be quite a challenge. First of all, it is difficult to reach proper situational awareness of what the needs and capacities are. The IFRC estimates that in some cases only 10% of the affected communities are reached in assessments. In doing assessments, most NGOs strive for compliance with the Sphere standards and follow principle two of the IFRC Code of Conduct (which is also the Code of Conduct for Sphere): "Wherever possible, we will base the provision of relief aid upon a thorough assessment of the needs of the disaster victims and the local capacities already in place to meet those needs." (Sphere, 2011: 370). The Caritas Internationalis emergency toolkit (Caritas Internationalis, 2007: 21) lists that first actions after a disaster include a check on: does the information suggest that local support (community and/or government and church) is sufficient to respond? Obviously for major disasters this is usually not the case. Second of all, operational iNGOs are typically in "delivery" mode. Lives and livelihoods are at stake and there is pressure of the donors and the media, so the pressure is on for iNGOs to show that they are active and providing relief. Often, local partners have limited capacities and therefore international organizations setup their own operations in parallel (as is reflected in how funding is allocated).

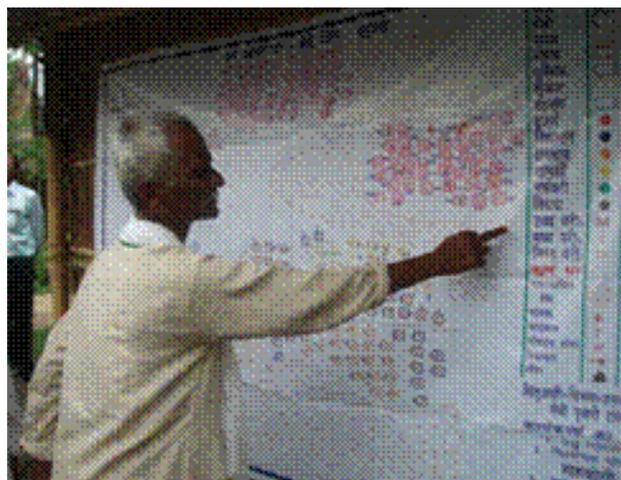


Figure 1: Example of the Participatory Vulnerability and Capacity Approach in India: the risk map

The challenges described above results in the objective of our research: to explore which novel information gathering and collaboration approaches enable international, national and local NGOs to better utilize their capacities, to reach better accountability both up- (towards donors)

and downwards (towards communities) and to optimize their interdependent efforts by building on the community as an important source of information.

3. Collaborative Approaches in the New Information Environment

The current information gathering and collaboration approaches of NGOs in disaster management center around participatory approaches such as Participatory Vulnerability and Capability Analysis (PVCA) in the preparedness phase (resulting in for example community risk maps, see Figure 1), mixed methods for monitoring and evaluation in the response and recovery phase (both up- and downward accountability (including information sharing with communities and complaint mechanisms)), and co-creating community-based or managed recovery strategies linking for example recovery to mitigation (how to build back better so that a next disaster will not affect a now collapsed house). Furthermore NGOs contribute to or make use of the earlier mentioned MIRA in the response phase or Post Disaster Needs Assessments (PDNA) in the recovery phase. The PDNA is a government-led exercise with the support of the EU, the UN system and the World Bank, bringing together national and international stakeholders to align recovery efforts in a coordinated way (UNDP Post Disaster Needs Assessment, 2014).

These collaborative approaches will however have to adapt continuously to a rapidly changing information environment. The World Bank report Maximizing mobile (World Bank, 2012) shows the tremendous growth of mobile telephony in developing countries and the evolution towards data-based services. Furthermore, usage of social media, social networks, crowdsourcing and online communities increases. On the one hand this can aggravate the challenge since for example more and more spontaneous but not necessarily skilled volunteers will be activated, lower entry barriers for new organizations get created thereby increasing competition and misinformation gets spread through these very same digital opportunities. On the other hand it offers opportunities to facilitate the collaboration challenge, for example tagging of social media by volunteer technology communities (Global Facility for Disaster Reduction and Recovery, 2014) can help NGOs to improve their needs assessment of the affected community and information can be disseminated more easily using mobile data-based services or online platforms between organizations and with communities.

There are many examples of intra-organizational platforms (such as from Oxfam, CARE, Caritas Internationalis and World Vision), but also inter-organizational and global platforms, all-purpose, all-hazard, exist such as DisasterAWARE from the Pacific Disaster Center, the Humanitarian Early Warning System from IASC and Humanitarian Response from UN OCHA. There are also bottom-up initiated community managed platforms such as Ushahidi making use of open data. Lastly, different forms of preparation exist for professionals and volunteers in order to acquire not only technical skills but also the soft skills to cooperate and coordinate individual ac-

tivities towards a collective effort (Di Loreto, 2012). One can think of exercises, trainings and (serious) games such as mock drills of community volunteer disaster management committees at community level or emergency management exercises of professional responders at regional or state level. What is however missing is both a platform and game approach that integrates the different intra- and inter-organizational levels and that includes the community perspective.

4. The COBACORE Project: An Example Research Project

A good example of the type of innovation suggested in the previous chapter is the COBACORE (Community-Based Comprehensive Recovery - www.cobacore.eu) project. The EU-funded COBACORE research project aims to address collaboration challenges between communities that exist in the various phases of disaster management.

The COBACORE project groups actors in disaster management into three main groups, as can be seen in Figure 2. The affected community are the people directly and indirectly adversely affected by a crisis or disaster and in need of urgent (humanitarian) assistance. The responding community consists of local or outside community members which support in relief or recovery but are not trained in crisis response. The responding professionals are part of the professional community in the field of crisis response and recovery, such as national and local governments, NGOs and national crisis coordination centers. The COBACORE project groups actors in disaster management into three main groups, as can be seen in Figure 2.



Figure 2: The three main groups of actors in disaster recovery

4.1. The COBACORE project

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members which support in relief or recovery but are not trained in crisis response. The responding professionals are part of the professional community in the field of crisis response and recovery, such as national and local governments, NGOs and national crisis coordination centers.

Actors will often belong to multiple communities. Professional organizations in the affected area will be affected in their capacities, and therefore may share needs with local affected communities. Local communities and businesses will usually be the first line of support after a disaster, and thus will also belong to both the affected and responding community groups. One could say that the intersection of both groups is a resilient community – one that is capable of tending to its own needs. Another interesting overlap is that between the professionals and the responding community. At the intersection of these groups, we can situate trained volunteers, willing and able civilians that have had a certain degree of training by professionals and thus can provide established services to the recovery process.

Based on an analysis of recent cases of natural and technological disasters (COBACORE, 2014), we found that there are three main types of collaboration issues that exists between the three communities: (1) hampered information exchange between the professional community and the affected community, (2) collaboration gaps between the professional community and the responding community and (3) inefficiencies in needs and capacity matching between the affected and responding communities. These issues form the main drivers of innovation in the project, and steer the development of novel collaboration principles and supporting technologies.

The main instrument of the COBACORE project is a collaborative platform that facilitates the interaction between members of the professional, affected and responding communities (e.g. between affected citizens, professional organizations and volunteer groups). The COBACORE platform helps to collate baseline information with current information about needs, capacities and activities, and offers options to learn which parties are active on various aspects of disaster recovery. By providing tailored

interfaces for each type of community, but drawing on the same information base, the platform helps to achieve a higher level of coordination and a better matching of needs and capacities.

The platform provides three main functions that directly answer the aforementioned key issues: (1) enhance the information exchange between the professional and the affected community, (2) facilitate the collaboration between the professional and the responding community and (3) improve needs and capacity matching between the affected and the responding community. The platform provides various features to its users that help to fulfil the main functions. The COBACORE project relies heavily on stakeholder engagement to uncover valuable features, and employs an incremental development process where new features are added after consultation with end users. The core set of features consists of ten features: facilities to register (a) actors, (b) needs, (c) capacities and (d) activities; options to match needs with capacities (e); option to obtain an overview of (f) needs and capacities, (g) actors and their activities and (h) the baseline situation; basic recovery monitoring views (i); and information exchange options (j). Needs and capacities are categorized via an expressive category and type system. A ‘category’ is one of twelve main societal domains that play a role in disaster recovery, such as transport, health or education. A ‘type’ is the sort of thing that is being sought or offered, where we distinguish three types: service or skill, information and asset (tangible or intangible). The combination of one or more categories with a type gives a simple yet expressive way to characterize needs, capacities, and activities. The COBACORE platform is implemented as a web service and is accessible through laptop or mobile device for each of the user groups: professionals, responding community and affected community. Figure 3 shows a screenshot of the current state of the platform.

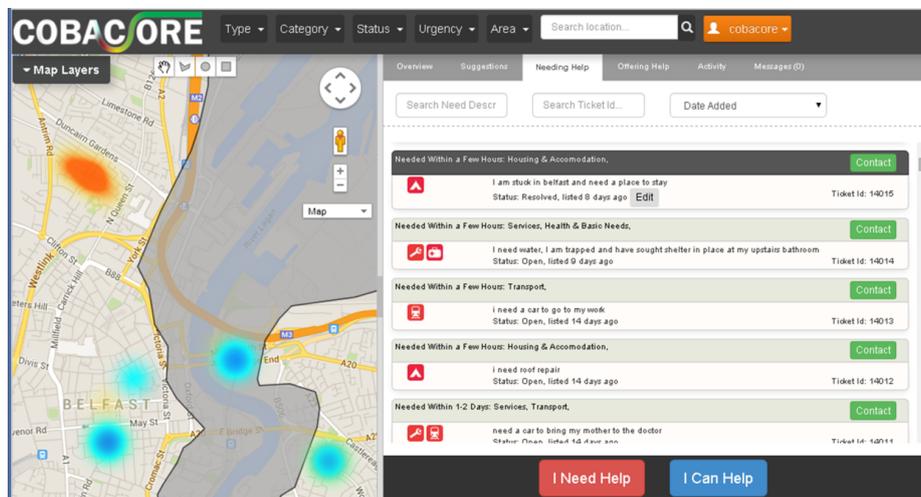


Figure 3: The COBACORE platform in its core feature state.

4.2. The COBACORE Gaming Approach

We developed a table-top turn-based simulation to –first of all- evaluate the platform and –secondly- to be used as a cooperative development game for the responding communities and professionals. Goals of the game are such that participants are required to assess needs and match capacities with these needs. The game consists of goals for each user group, workflows and actions, user group profiles and the evolving scenario (a disaster that had struck the city of Rotterdam/Belfast). Central to the evaluation is the comparison between a situation where user groups interact with the platform and a situation in which they employ state-of-the-art social media tools. In both conditions, user groups have the task to carry out needs assessment activities within a short duration scenario (typically one to three hours). Figure 4 shows the COBA-game set-up, where the different user groups are placed in different rooms.

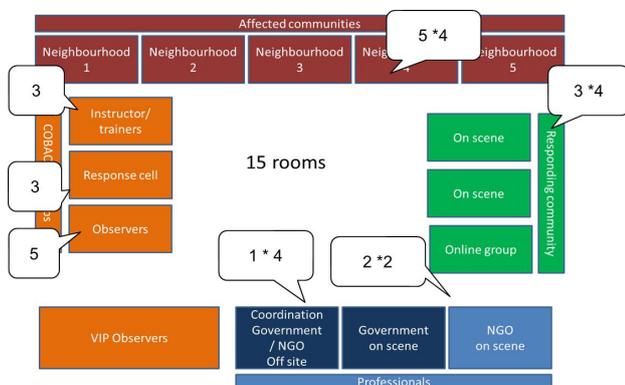


Figure 4: The COBA-game set-up

First, affected communities will be introduced into the scenario: the general crisis situation, their individual needs and how needs can be identified and communicated on a community level in the COBA-game. This will be introduced step-by-step, particularly because formulating community needs requires coordination via an appointed spokesperson. The community will have to self-organize this process of how to articulate needs on a community level. The self-organization has to be monitored and facilitated however, since experience learns that otherwise one gets the needs from the community leadership and not from the marginalized people in the community. The individual and communal needs will then be fed into the COBACORE platform by the users. Thereafter, the system will give instructions on which available capacities are present in the vicinity of the person that posted the need. The system will give instructions based on 1) physical proximity and 2) overlap in capacity and need via a standard categorization of needs and capacities from the COBACORE database.

In June 2014, the above game was held in Rotterdam, The Netherlands over the course of two days, with a participation of more than 40 volunteers from the Dutch Red Cross and representatives from Dutch Safety Regions. This experiment had a non-fielded setup, and thus lacked

full alignment with operational practices. At the end of the project, the COBAgame will be held in a second iteration with the platform in its final stage and in a more operational setup with participation of multiple professional and volunteers groups in the German-Dutch border area.

4.3. Project Ambitions

The COBACORE project does not have the objective to build an operational product, but rather strives to develop a foundation from which useful novel applications and approaches can be developed. Because of the differences in disaster management across the world, and because of the differences in societal capabilities and preferences between countries, it seems hard to envision an platform shape form that suites each and every disaster event. So, therefore the COBACORE platform foundation needs to be translated to suit local characteristics and suit the operational demands of active responding NGOs. To this end, the project will work with NGOs and national response organizations to build localized versions of the platform. Additionally, the gaming approach will be promoted as a valuable asset to training programs of response organizations.

5. Discussions and Conclusions

Large scale natural and man-made disasters require system-wide mobilization and sustained, concerted efforts by multiple stakeholders. All too often we see however collaboration gaps between stakeholders, levels of operations and different phases in the disaster management cycle. Specifically, communities are insufficiently involved and comprehensive knowledge about the affected environment is missing. NGOs have –more than most other stakeholders- affected communities at the core of their “raison d’être” and empower communities using participatory approaches for creating vulnerability and capability awareness and shared action plans for increased resilience and preparedness. Furthermore, they have usually well-organized access to communities through strong linkages to grass-roots organizations. Cordaid has for example utilized in the response to the Typhoon Haiyan the Philippines Caritas member organization NASSA. The rapidly changing and new information environment consisting of mobile services, social media, social networks, crowdsourcing and online communities offers new opportunities to engage with communities but also new challenges to stay abreast of all that’s communicated digitally. New collaborative approaches will be required to make sure collaboration gaps are being closed. The EU-funded COBACORE project developed a novel conceptual framework for closing the collaboration gaps between members of the professional, affected and responding communities (e.g. volunteer groups) in terms of issues, functions and features. The framework is translated into a web based platform and table-top simulation. The platform helps to register needs, capacities, activities and acquire situational information by the whole, and provides facilities to obtain better matching of needs

and capacities. We emphasize that both the platform and the game consist in fact of a technical, social and socio-technical layer. The technology is only a part of the solution and crucial for adoption will be the interaction between the platform and the users.

The principles behind the COBACORE platform apply to both the developed and developing countries context, since resilience enhancement and risk reduction is a collaborative process by default. Given that many disaster affected communities still live in resource-poor environments, it will be essential for NGOs to develop a hybrid collaborative platform that can combine both digital and non-digital input. Such a platform will enable NGOs to deal with the new information environment, adapt to the growing role of responding communities and take on a clearer coordinating and steering role. Adoption of such a platform should already take place in the preparedness phase. We foresee that the professional community might more easily adopt a COBACORE like platform, as it can for example become part of their training curriculum and daily work, than communities will do. It will be essential to investigate how adoption and ownership by communities can be assured for example by piloting the platform in one of the areas where Cordaid operates.

The platform focuses on usage in natural and technological disaster settings, where it relies on a fairly open and transparent process of collecting and sharing information amongst different stakeholders. However, from 2005-2009, more than 50% of people affected by 'natural' disasters lived in fragile and conflict-affected states (Kellet, 2012). When disasters and conflict collide (Harris, 2013), there will be additional challenges in using a participatory platform, such as the suggested COBACORE platform. The platform could be used by actors with malicious intent (Goolsby, 2013). The matching functionality of the platform will be much more sensitive and delicate in these conflict settings than in natural disaster settings. Actors in such settings include for example unstable governments and armed groups. And the affected community, the people at risk, know usually most about their predicament and have the greatest insight into the threats against them. However, disclosing such information could put them at risk.

The new information environment will create tough challenges both for disaster and conflict settings in terms of privacy, governance, content generation and validity. These are issues that will need further research. Although NGOs are not social computing organizations (Meier, 2014), it is recommended to expedite developing a basic social computing understanding (and possibly capability) in-house so that digital technologies can be incorporated into relief and recovery activities more easily. We note that development agencies are usually already more ahead with adopting and adapting to these new technologies than relief agencies are.

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