

# **EARTHQUAKE RELIEF: SHIFTING ATTENTION?**

**Peter Smit**

Lecturer, Coastal Zone Management

Van Hall Larenstein

[peter2.smit@wur.nl](mailto:peter2.smit@wur.nl)

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This paper is part of a series on “Making communities safer: challenges of creating effective disaster risk reduction partnerships”. The series arose out of a panel on this theme at the World Conference of Humanitarian Studies in Groningen, The Netherlands, 4-7 February 2009 ([www.humanitarianstudies2009.org](http://www.humanitarianstudies2009.org)). It includes papers given at the panel and those of others who submitted papers but were unable to attend the conference.

*“The local community is taken as the primary focus of attention since that is the common unit which is affected by disaster and, more importantly, responds to deal with the event.”*

Russell Dynes, 1991

## Abstract

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*This paper discusses the processes during the relief phase after the occurrence of an earthquake. Major earthquakes result in disaster that outstretches the local, regional or even national capacities to deal with the consequences. International assistance is provided to rescue people from underneath collapsed buildings. However, more and more questions are raised if investment in local search and rescue capacity would not be more worthwhile. Although it is clear that local capacity can be degraded and will not function normally, after the “golden period” rates of rescue begin to diminish dramatically; international rescue teams will only be able to rescue a limited number of survivors alive.*

*In this paper the 2005 South Asia earthquake (with an emphasis on Pakistan) and the 2006 Yogyakarta earthquake in Indonesia are analyzed in order to provide more insight in the search and rescue of both earthquakes.*

*In the search and rescue phase, in Pakistan international assistance was provided, in Indonesia international assistance has not been required. This does not only have to do with differences in magnitude and consequently the number of victims and survivors, but also with the different local and regional capacities in both countries. For instance, the Indonesia Red Cross Society can provide basic services for up to 250,000 beneficiaries at the same time. In the immediate hours after the earthquake 400 staff and volunteers were mobilized. In Pakistan, little knowledge and understanding of how to respond at national, local or community levels was available. Strengthening preparedness mechanisms should be included in building local, national and regional capacities for response in emergencies.*

The 2005 South East Asia earthquake, in particular in the Pakistan region, has raised worldwide alarm, due to the large number of deaths and the inability to help many people, who after three weeks still had not been reached. Jan Egeland, the United Nations Under-Secretary General for Humanitarian Affairs and Emergency Relief Coordinator, verbalized these difficulties to reach survivors in the newspaper *Dar Al-Hayat* of 31 October 2005 as follows:

Aid workers in Pakistan have been hampered by a logistical nightmare the likes of which we have never seen, not even in the tsunami crisis. Several factors - the high altitude, mountainous terrain, the almost complete destruction of infrastructure in a huge swath of territory, ongoing landslides and aftershocks, and a harsh winter just days away, has made this the toughest logistical challenge the aid community has faced to date. The enormity of the challenge underscores the need for good cooperation on the ground to ensure that scarce resources are best utilized.  
(Egeland, 2005)

An interesting question arises: Is Pakistan an isolated incident or a situation in which many existing problems of relief work occur simultaneously?

Alexander (2005) presents, amongst others, the following elements as part of the problems around preparedness and relief:

- Chronic lack of preparedness in an area whose susceptibility to large earthquakes is known in great detail
- Spectacular collapses, and associated heavy mortality, in large, modern, reinforced concrete buildings that were not constructed anti-seismically
- Vast numbers of homeless people, especially in inhospitable high mountain area where traditional housing has collapsed en masse
- Early relief largely in the hands of untrained, unequipped local people, especially regarding the rescue of trapped survivors
- Foreign rescuers arriving in large numbers (and at huge cost), but substantially after the end of the 'golden period' in which significant numbers of people can be rescued from the rubble of collapsed buildings.

(Alexander, 2005: 1)

Even though the outcry of Egeland for good cooperation on the ground should be noted, Alexander argues that the story repeats itself; therefore this case is not an isolated one. The elements of chronic lack of preparedness, but in particular the early relief in the hands of local people and the late arrival of foreign rescuers, are supported by a report of the International Federation of Red Cross and Red Crescent Societies and the Iranian Red Crescent Society, reviewing the response to the earthquake in Bam, December 2003 (IFRC/IRCS, 2004). The local

Iranian Red Crescent Society only had 10 sniffer dogs and no specialist equipment, but rescued approximately 1,000 people, while 35 international search and rescue (SAR) teams, arriving more than 36 hours after the event, saved only 25 lives.

This paper discusses in more detail the processes involved in the relief phase just after occurrence of an earthquake with an emphasis on the search and rescue phase, providing more insight into the contribution of local and regional as well as international operations. It addresses the question of whether or not it is useful to shift attention from international to local and regional capacity to make communities safer in earthquake-prone regions. Community-based disaster preparedness as an element of a disaster risk reduction approach is evaluated as a tool to increase the resilience of communities exposed to earthquake disasters.

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## **Background**

### **Resilience**

The Hyogo Framework for Action (HFA) aims at a sustainable reduction of disaster losses. The reduction of losses is focused on a reduction in lives lost as well as losses in the social, economic and environmental assets of communities and countries. The framework's essence is to build the resilience of nations and communities to disasters. The academic debate about the definition of 'resilience' (Manyena, 2006) is not conclusive; however, for this paper it is sufficient to bear in mind that resilience is not restricted to e.g. improved physical infrastructures to resist earthquake impacts; the emphasis in this case will be on the resilience of communities. Therefore, we adopt the UNISDR definition of resilience: "The ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions." (UNISDR, 2009: 10).

### **Search and Rescue**

After the occurrence of an earthquake, search for and rescue of those who survived the earthquake but are trapped, starts. The search and rescue phase can be easier or more difficult depending on the level of entrapment. United Nations Disaster Assessment and Coordination (UNDAC) uses a system to classify different teams deployable for Urban Search and Rescue (USAR) (UNDAC, 2006). Local resources will start to rescue those who are lightly trapped with minor injuries. Specialized teams will come into action in the immediate aftermath of the earthquake to assist with this surface search and rescue. These light USAR teams often come from the affected country itself or from neighbouring countries. When structures have collapsed, medium USAR teams are able to break, breach and cut concrete associated with those structures typically found in suburban areas. Concrete reinforced with structural steel, found in urban settings is left to the heavy USAR teams. The medium USAR teams should be operational within

32 hours in the affected country; the heavy USAR teams have an additional 16 hours to reach their destination in the affected country (UNDAC, 2006).

### **Community-based disaster preparedness**

When a disaster occurs, the people at the local level (community or village) suffer its adverse effects. Before external help arrives, they have already applied coping and survival strategies to deal with the situation they are faced with, and they are interested in increasing their possibilities to decrease the impact of the disaster.

A large number of studies have been devoted to the principles of community-based approaches to Disaster Risk Reduction (CBDRR) and the strengths and weaknesses of these approaches. Even though we will not elaborate on these here, we do want to mention one complicating issue: the definition of a 'community'. From a hazards point of view a spatial delineation is vital, but other factors complicate this definition of people living in the same area. Communities are not homogenous with respect to economic and social characteristics, the composition is dynamic and people can be members of different communities at the same time and this influences their perception of the community they belong to. Furthermore, communities do not exist in isolation and are influenced by capacities outside the community (Twigg, 2007). However, bearing this in mind, the sudden onset of an earthquake can result in disruption of whole communities and therefore influences disaster preparedness at community level, as will be discussed.

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### **Methodology**

This paper aims to provide support to the discussion of whether or not it is viable to shift attention towards local and regional capacities with respect to earthquake rescue operations. The research can be best described as explorative. Although several aspects discussed in this paper have been investigated in detail before, these different aspects are not usually combined. Therefore, we use explorative research as a tool to provide a better insight and understanding of the subject.

To get an overview of the occurrence of earthquakes and the number of survivors involved, in relation to applied rescue operations, we have analyzed the available data through literature / internet research. Additional information has been obtained via structured interviews (email / phone) and in-depth interviews (face-to-face) with persons who have experience in the field of rescue operations.

Every year the U.S. Geological Survey's National Earthquake Information Center reports over 30,000 earthquakes. Despite our familiarity with the earthquake-prone regions in the world, on average 25 of these quakes cause significant damage, injuries or fatalities. Whether these earthquake hazards actually turn into a disaster depends on a lot of different factors. The response to these disasters depends on their size. Residents of the hit area who survived the quake start helping casualties, trying to save trapped people or providing first aid. Shortly afterwards more professional bodies, for instance local Red Cross societies or the army will assist in this relief phase. If the magnitude of the disaster outstretches the local or national coping capacities, the national government can call for international assistance. International Urban Search And Rescue (USAR) teams are flown in, often in combination with medical assistance and followed by relief, such as shelter and food. Although these highly specialized teams from all over the world still rescue people from underneath collapsed buildings, increasingly questions are raised whether investment in local search and rescue capacity would be more worthwhile.

Two major earthquakes that occurred in the last couple of years are discussed as case studies: the South Asia earthquake (with an emphasis on Pakistan) of early October 2005 and the Yogyakarta earthquake in Indonesia of late May 2006.

### **The Facts**

In Table 1 (p. 7) some of the main characteristics of both earthquakes are presented. The rather large difference in magnitude probably influenced the number of deaths; the Pakistan earthquake resulted in a number of deaths that was twelve times higher in comparison with the Yogyakarta earthquake. As expected, the number of affected people and the total damage in the case of Pakistan is higher than in Yogyakarta. However, the number of people injured in Yogyakarta is higher than in the Pakistan earthquake; one of the possible explanations is that the number of people rescued during the Yogyakarta earthquake is higher, but that these people suffered from injuries. The time that the earthquake occurred has a possible influence on the number of people killed and injured as well. Alexander (1996) studied 83 earthquakes and concluded that 94% of the deaths and 77% of the injured occurred between 00:00 and 06:00 am, local time. In the light of this result the Yogyakarta earthquake could have resulted in a relatively higher number of casualties, due to the fact that more people would have been at home.

*Table 1 Main Characteristics of Pakistan and Yogyakarta earthquakes*

	Pakistan	Indonesia
	Bagh, Muzzafarabad, Poonch (Kashmir), Abottabad, Battagram, Kohistan, Mansehra, Shangla (NWFP)	Yogyakarta, Central Java
Date	8 October 2005; 08:50 local time	27 May 2006; 05:53 local time
Magnitude	7.6 Richter	5.9 Richter
Number of people killed	73,338	5,778
Number of people injured	128,000	137,883
Number of people affected	0 <sup>1</sup>	2,340,745
Number of people homeless	5,000,000	699,295
Total number of people affected	5,128,000	3,177,923
Total damage (in US\$)	5,200,000	3,100,000

Created on 11 June 2007 Data version : v03.07

Source: "EM-DAT: The OFDA/CRED International Disaster Database [www.em-dat.net](http://www.em-dat.net) - Université Catholique de Louvain - Brussels - Belgium"

Studies of earthquake disasters often do not comprise a lot of detail about the search and rescue; more information is available about the relief phase. However, based on the scarce information available, the search and rescue phase of both earthquakes can be reconstructed.

In the case of the Pakistan earthquake it became clear that thousands of people had been killed. Those seriously injured were in need of rescue and medical attention but the local health services had been decimated badly. All the search and rescue work had to be carried out in mountainous and hilly areas. Hundreds of remote villages were rendered more inaccessible by destroyed roads and infrastructure. As a consequence, the first search and rescue phase was carried out by local people, supported where possible by the Pakistani army. The rescue operations were difficult

<sup>1</sup> EM-DAT makes a difference between the number of people affected and number of people homeless (<http://www.emdat.be/ExplanatoryNotes/explanotes.html>). According to EM-DAT the number of people affected is defined as: "People requiring immediate assistance during a period of emergency; it can also include displaced or evacuated people" and the number of people homeless is defined as: "People needing immediate assistance for shelter". An interesting observation from the data retrieved from EM-DAT is that in the case of the Pakistan earthquake, all the people besides those injured were labeled as homeless and not as affected. In comparison, in the case of the Yogyakarta earthquake 22% of the people were labeled as homeless, the rest as affected. It seems that people in need of a shelter *and* requiring immediate assistance are labeled as "homeless" and if people only require immediate assistance they are labeled as affected. However, this observation is not substantiated with information on EM-DAT's website.

because of lack of professionals and specialized machinery. How many people have been rescued by local people is not clear (Idris, 2007).

The Government of Pakistan requested international assistance within 24 hours and several USAR teams were deployed to Pakistan to assist in the phase of search and rescue. On the 9<sup>th</sup> of October the first UNDAC team arrived in Islamabad, while two international USAR teams were already in-country. During the 9<sup>th</sup> and the 10<sup>th</sup> of October international USAR teams continue to arrive (in total 19 international USAR teams announced their departure via the Virtual OSOCC<sup>2</sup>). The USAR operations continued until the 13<sup>th</sup> of October; on the 13<sup>th</sup> the operations started shifting to relief. On the 14<sup>th</sup> of October the international USAR teams started to withdraw and on the 16<sup>th</sup> of October the SAR phase was over.

Table 2 gives an overview of the live rescues recorded. The information is retrieved from Virtual OSOCC.

*Table 2 Overview of live rescues (until 14 October 2005)*

Date	Location	Number of live rescues
09 October 2005	Muzaffarabad	1
10 October 2005	Muzaffarabad / Islamabad	14
11 October 2005	Muzaffarabad / Islamabad	4
12 October 2005	Muzaffarabad	5
	Total	24

Source: Virtual OSOCC; consulted 2 November 2006

It is striking that the number of people rescued by international USAR teams is known exactly while the number of people saved by local people, probably a much larger number, is not known at all. There are no records available on this particular item.

In the case of Yogyakarta, international assistance had not been requested. Bliss and Campbell (2007) evaluated the assistance provided to the affected. One of the key findings in this evaluation was that private individuals assisted predominately with rescue and locating missing persons within 48 hours of the occurrence of the earthquake (see table 3).

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<sup>2</sup> Virtual On-Site Operations Coordination Centre: through real-time exchange of information by all disaster response community actors, the Virtual OSOCC facilitates decision-making for international response to major disasters (<http://ocha.unog.ch/virtualosocc/>)



*Table 3 Primary Provider for each assistance category, 48 hours after the occurrence of the earthquake (in %).<sup>3</sup>*

	Private Individual	Local Government	National Government	Military	INGO	Local NGO	Corporate	Religious Org.	Other/Don't Know
Rescue	78	10	1	2	1	4	1	1	2
Locating Missing persons	90	2	1	2	0	1	0	0	3
Help with Deceased	79	8	0	0	2	5	0	0	6
Shelter	62	20	3	2	2	3	2	1	5
Medical care	31	44	5	1	5	8	3	2	1
Drinking Water	61	21	1	1	2	7	4	1	2
Food	64	16	3	0	1	6	5	2	3
Relocation	65	18	0	2	0	0	0	2	13

Source: Bliss and Campbell (2007)

As can be seen in the table above, in case of assistance with rescue and locating missing persons, respectively 78% and 90% is provided by private individuals. Often local emergency preparedness initiatives focus on capacity building and training at the community level; while such programs are essential, training at the household level is also critical.

Indisputable is the fact that during the occurrence of an earthquake the situation can change from one of normality to one of overwhelming need in a matter of seconds and minutes; the time to save lives will be measured accordingly, varying from minutes to hours. Researchers differ in their opinion about the length of the “golden period” in which significant numbers of people can be rescued, but the rates of rescue will diminish in time and international rescue teams will generally arrive in large numbers after the end of this period. Therefore earthquake preparedness and self-reliance in the community, particularly the training and education of local volunteers in basic first aid and rescue in earthquake-prone areas, should be emphasized more. Community disaster preparedness is important because most survivors are rescued by friends and neighbours rather than by organised rescue teams.

### **Disaster preparedness**

In the Yogyakarta earthquake several organisations participated in the rescue and relief phase. One of the organisations was the Indonesian Red Cross Society (Palang Merah Indonesia = PMI). Due to their long history in responding to natural disasters the organisation has established a 20 member emergency response team (Tim Khusus) and seventy 30 member SATGANA teams (rapid response and disaster preparedness/risk reduction). These teams are able to provide basic services for up to 250,000 beneficiaries at the same time. In the immediate aftermath of the

<sup>3</sup> The numbers represent the percentage (%) of the total provided assistance by the various providers: e.g. if 200 persons were rescued in total (after 48 hours), 156 were rescued by private individuals (78%)

Yogyakarta earthquake the Indonesian Red Cross Society mobilized more than 400 staff and volunteers; luckily, by accident, 200 of them had already been supporting internally displaced populations under the Mount Merapi operation (IFRC, 2006). A SATGANA team is specially developed and established to participate in disaster management in the geographical area of an individual branch of the PMI. The teams have a minimum of 30 volunteers and are managed by volunteers as well. Among the functions with the group are SAR, evacuation and first aid. SATGANA volunteers normally already have had a Red Cross training (of more than 48 hours) but in addition they get a specific training of 120 hours (IFRC, 2004).

In the case of the Pakistan earthquake of 2005 Idris (2007) concluded that search and rescue in the first phase was carried out by local people lacking the support of professionals and specialized machinery: “The country’s capacity to undertake rescue operations was very poor: there was a lack of trained personnel and specialist equipment. There was an over-dependence on foreign search-and-rescue teams which, by definition, took time to reach the affected areas. When coupled with the massive destruction to road and communication networks and constraints on air transport capacity, this very likely meant lives that could have been saved were lost.” (Idris, 2007: 73). The challenge to build Pakistan and its communities’ resilience to disasters was clearly present. Therefore, in March 2007 the National Disaster Management Authority was set up to serve as a focal point for coordinating and facilitating the implementation of strategies and programmes on disaster reduction, response and recovery; also, the National Disaster Risk Management Framework was published. The report states that its vision, mission and priorities have been developed in harmony with the Hyogo Framework of Action (NDMA, 2007). It addresses the implementation of community and local level risk reduction programmes as a key issue. To achieve the goals and objectives of the framework at this level, projects and programmes will be designed and implemented in selected districts and municipalities. The programmes will focus, amongst other things, on community organizing, training, awareness-raising, and volunteer training in search and rescue. Activities will be implemented at village, neighbourhood, city and school levels. The United Nations Development Programme (UNDP) works in close collaboration with the NDMA to build Pakistan’s disaster management capacity and has published several training manuals, amongst others a manual for those who conduct trainings on disaster management for communities (UNDP, 2007a; UNDP, 2007b). Information regarding achievements in training communities so far is not easily obtained. Achievements by the NDMA are presented on its website and these include courses to strengthen disaster response capacities, but it is not clear whether this is done at the community level.

Although not included in this research, the 2008 Balochistan earthquake in Pakistan has been briefly reviewed with respect to local search and rescue initiatives based on community based disaster preparedness programs: to date, unfortunately, no information on this particular subject could be found.

## **Conclusion**

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The title of this paper raises the question whether or not the attention with respect to earthquake relief, and more specifically, earthquake search and rescue, should shift towards preparedness at local or community level. Do communities become safer in this way? As with all sudden-onset disasters, during an earthquake disaster, the situation moves from one of normality to one of overwhelming need in a split second. Within minutes, hours after the earthquake impact search and rescue should start; after this “golden period” rates of rescue will diminish.

No or limited disaster preparedness, as is shown in the case of the 2005 Pakistan earthquake, results in lives lost that otherwise could have been saved. Over-dependency on international assistance that takes by definition time to reach the areas of impact is not desirable: often the international search and rescue teams arrive largely when the period in which the number of people can be rescued alive is over.

Organizing disaster preparedness at the community therefore pays off, as is shown in the case of the 2006 Yogyakarta earthquake. Resilience building via community-based disaster preparedness in the case of earthquakes should be supported. However, important in this case is what should be considered a community. The heterogeneous and dynamic character of communities makes it hard to view them as just a spatial delineated entity, furthermore complicated by a individuals’ own perception of what constitutes a community. The 2006 Yogyakarta earthquake shows that the role of the individual is even more stressed due to the fact that private individuals are the primary providers of assistance within 48 hours after the occurrence of the earthquake.

Preparedness training programmes therefore should without doubt continue to be aimed at the community level but providing basic training in search and rescue at the household level could be an essential extension. Especially in the case of disaster response to earthquakes this could be critical, due to the fact that all levels within the disaster response institutions (e.g. the local government officials involved), might be affected and areas affected by the earthquake might be cut off from assistance. In the first minutes, hours or even days, the members of communities, individuals, have to cope with the impacts of the disaster themselves and therefore should be equipped to make their own community safer.

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