RESEARCH NOTE

Building Disaster-Resistant Communities: Lessons Learned from Past Earthquakes in Turkey and Suggestions for the Future

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This paper presents findings from a pilot study aiming to strengthen community participation in disaster mitigation and preparedness in a province, Bursa (Turkey), which is located in the first-degree seismic zone. The study was initiated in 1998, right after the Ceyhan-Misis earthquake and a year prior to the devastating 17 August Marmara, Turkey, earthquake. Therefore, the findings will be discussed within the framework of what happened before and after the devastating earthquake in order to analyze possible effects of a major disaster on the momentum and processes of community participation efforts. The initial phase of the pilot study focused on the collection of data through in-depth and focus group interviews aiming to uncover local views on disasters, mitigation, preparedness, and multisectoral collaboration and participation. The results of the initial phase showed an eagerness for local multisectoral participation and favorable attitudes towards community participation. Earthquakes were delineated as the most threatening.

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ype of natural disasters in this initial phase. Thus, the study focused solely on earthquakes as a first area to start community involvement and to analyze mechanisms for such involvement. In the second phase of the study, an attempt was made to bring together the local state authorities, municipalities, the private sector, and the nongovernmental organizations, in order to develop an action plan for mitigation and preparedness through the involvement of the local community. This collaboration took place under the initiative of the Local Agenda 21, a local municipal initiative under the U.N. Rio Summit 1992. The most important issue identified by the local multisectoral committee was the need to increase community awareness for earthquakes and to train them on what to do before, during, and after earthquakes. Subsequently, a pamphlet and a training-of-trainers handbook were prepared, and a phase of training of trainers was undertaken. The program had very little momentum due to mainly the hesitancy of the actors from different sectors in forming alliances and due to the purely voluntary nature of the work. There were also problems related to the lack of funding for the project. As the study came to its second year, with a further loss of momentum due to local elections and change of the initial municipality, the August 1999 Marmara earthquake occurred. This very devastating earthquake produced a significant momentum for the community participation initiative in Erzurum which was considerably slow to develop. The occurrence of a major disaster while a community participation project was underway provided us with valuable insights on what was hindering the project. It was basically the lack of a lack of fearlessness, lack of acceptance of risks, lack of local ownership, and the lack of an awareness of possible consequences of such a disaster.

The Marmara earthquake of August 1999 demonstrated that there were significant shortcomings in earthquake mitigation and preparedness measures. Due to the excessive damage and the fact that the quake affected a very large area, the response of the government in the immediate postdisaster phase was slow and uncoordinated. However, the Nongovernmental Organizations (NGOs) were very rapid in their responses, and numerous NGOs were involved in the rescue phase and thereafter. Unfortunately, the NGOs were also not prepared for such a disaster, and thus their efforts were not
coordinated. This recent earthquake once again pointed out the necessity of increasing community involvement in disaster management and creating collaborative alliances among local governmental bodies, municipality, the private sector, and the NGOs. Due to very extensive media coverage of the Marmara earthquake, the majority of people in Turkey watched the consequences from the TV and got sensitised to the damage and losses. Furthermore, the popular cultural view broadcasted through the interview with survivors was that “you can not trust and rely on external aid. You have to rely on your own resources.” The progress in the Bursa study will be discussed within the framework of the impacts of the Marmara earthquake. The strengths and the weaknesses of the present disaster management system in Turkey and the mechanisms uncovered in the Bursa study will be presented together with implications and suggestions for the future.

Effective planning and action for disaster mitigation and preparedness involves various social units such as central and local governmental agencies, the private sector, NGOs, local communities, and international agencies. The importance of strengthening the capacity of local communities in disaster reduction has been repeatedly stressed (Bates, Dynes, and Quanrantelli 1991; Dynes 1993; FEMA 2000). The Federal Emergency Management Agency (FEMA) recognized that for efficient and sustainable disaster management it is crucial to get the participation of the local communities. Based on this recognition, Project Impact (PI) was launched which aims to develop disaster-resistant communities. The overall aim of PI is to bring communities together, in order to take actions collaboratively so as to mitigate and to be prepared for disasters. To strengthen the capacity of local communities, it is crucial to understand the attitudes, expectations, and resources of the local community in order to develop plans that can be integrated into the ongoing social life of the communities in disaster-prone areas (Karanci and Aksit 1998). Furthermore, as has been stressed by Webb, Wachendorf, and Eyre (2000), it is important to examine the popular culture of disasters in order to understand the local views on disasters, the views on mitigation and the responsible agents for mitigation, in order to promoting programs tailored to local needs. This is particularly important in countries like Turkey which are in a rapid transition to modernity but which still may hold traditional views on
disasters, mitigation and the agents responsible for mitigation, like government, the private sector, community organizations, etc.

For building disaster-resistant communities, the first step is to create community awareness of the risks of future disasters and to empower local communities and authorities by collaboratively developing and implementing action plans for mitigation and preparedness. For the sustainability of disaster management plans, it is essential to develop local ownership and to activate mechanisms that will sustain these efforts. In Turkey, although not very common, community participation programs have been used in the areas of health (Aksit, Aksit, and Lohfeld 1994) and education (Kagitcibasi 1998) but not in disaster management. Therefore, before initiating such an initiative it is important to understand how the central and local government agencies, the private sector, NGOs, and the local community members evaluate the concept of community participation. For example, Tatı (1996) pointed out that in Turkey the prospect of community participation in health does not look very good due to the medical approach adopted by policy-makers. This approach uses community participation as a means to an end. It focuses on educating the community so that they obey the doctors. Therefore, it displays a top-down approach to community participation.

Studies with the residents of metropolitan centers experiencing recent earthquakes in Turkey have shown that, although the community members perceived risks for future earthquakes and believed in the possibility of mitigation, a minority engaged in preparatory activities. For example, 82 percent of a sample of 1992 Erzincan, Turkey, earthquake survivors believed that mitigation is possible. However, only 48 percent believed that they can themselves do anything for mitigation (Rustemli and Karanci 1999). Similarly, Karanci and Aksit (1999), in their study on the 1995 Dinar earthquake, reported that 71 percent of the sample believed that in general mitigation is possible. However, this percentage dropped to 47 when they were asked whether they can themselves take any action for mitigation. Thus, although earthquake survivors in Turkey believe in the possibility of mitigation, their views on personal control of mitigation seem to be less optimistic. Furthermore, they believe that taking measures for mitigation is the responsibility of agents other than themselves. The most frequently cited agents were the state authorities or the municipality (Karanci 1997; Rustemli and Karanci 1999). Previous studies also pointed out that, although the earthquake survivors in Turkey believed in the possibility of mitigation, very few took preparatory action. In the Erzincan study
those reporting that they have engaged in any sort of preparation were 30 percent, and in the Dinar study this was 13 percent. Rustemli and Karanci (1999) noted that self-reported fear/anxiety and belief in control were significant predictors of engaging in preparatory behavior.

The present paper will first briefly focus on the legislation concerning disasters in Turkey. Subsequently, findings from a project aiming to strengthen community participation in disaster management in Bursa (Turkey), a metropolitan city located in the first-degree seismic zone but which has not yet experienced a recent earthquake, will be presented. The findings from the Bursa study will be presented in two sections, the first section dealing with what took place before the devastating August 1999 Marmara earthquake and the second part focusing on what happened in Bursa after the Marmara earthquake in order to delineate possible mechanisms giving momentum to the community participation initiative in Bursa.

The Turkish Disaster Law and the Institutional Framework

In Turkey, the first law concerning disasters was enacted in 1944. This law solely focused on earthquakes. The reason for this was that the major type of natural disaster affecting Turkey is earthquakes. About 66 percent of the population live in high earthquake-risk areas. During 1903-1998, 130 earthquakes occurred in Turkey, causing the death of 72,000 people (Ergunay 1999). The 1944 law was a response to the devastating 1939 Erzincan earthquake and several similar subsequent earthquakes, and it was the first law to stress the need for plans for rescue, material aid, and temporary shelter prior to the occurrence of earthquakes. The law also had a clause that emphasized compensation for the loss of property. The formation and the funding of provincial rescue and emergency aid committees were also introduced. In 1959 a new comprehensive law (Law No. 7269) covering disasters other than earthquakes, like fires, floods, landslides, and similar disasters replaced the 1944 law. The responsibility for its execution was given to the Ministry of Public Works. This law established the duties and the responsibilities of the "Provincial Rescue and Aid Committees." Turkey is divided into 80 administrative units, the provinces. The governors, appointed by central government, govern the provinces. The governors are the heads of the Provincial Rescue and Aid Committees. The main emphasis is to make and keep the plans for provincial rescue and aid updated and to clearly delineate the personnel involved in such plans. In 1983 in order to ensure the coordination between the central and
provincial administration an “Extraordinary Status Co-ordination Council” has been developed which is established if the need arises by the government. In connection with the law, a “Disaster Fund” has been established to ease financial support in time of disasters.

The development of earthquake zonation maps in Turkey started in 1944, and with numerous revisions the most recent one was developed in 1996. Similarly, earthquake-resistant building codes were revised several times, and the most recent one was published in 1997.

As can be observed, in all these laws and specifications, although detailed responsibilities are given to the central government and the local authorities, the nongovernmental organizations and the private sector are not involved in the system. Furthermore, the legislation solely focuses on preparedness on rescue, relief, and temporary settlement. Measures on mitigation are not included. The municipalities are responsible for the enforcement of zonation maps and building codes. However, by placing the central responsibility on the provincial administrators, the legislation undermines the responsibilities of the municipalities in disaster management. The system is highly hierarchical, and the linkages between central and provincial government are not adequate at the time of disasters (Karanci, Aksit, and Sucuoglu 1996; Erkanay 1999).

Project to Strengthen Community Participation in a Province not Recently Struck by an Earthquake: Bursa as a Metropolitan City Located in the First-Degree Seismic Zone

In 1998 Bursa was delineated as a pilot metropolitan center for strengthening community participation in disaster management. The aim was to examine mechanisms for strengthening community participation in disaster management in Turkey so those guidelines that can be utilized in other provinces could be developed. We first aimed to identify existing and prospective local institutions and networks and then facilitate mechanisms to strengthen and/or empower them so that local people will be better able to get prepared for a future disaster when it strikes and/or have greater welfare if disaster does not strike.

Bursa is one of the seven metropolitan centers in Turkey with a population of more than 500,000. These metropolitan centers have main municipalities consisting of city portions of more than one district, each of which has its own municipality (SIS 1990). Bursa metropolitan center with a population of more than one million has three district municipalities. All three municipalities, but especially two, have
received a massive influx of migration. According to recent calculations, in the period between 1980-1985 Bursa received 15,600 migrants every year. In 1985-1990 yearly migration inflow increased to 25,000. Among seven metropolitan centers in Turkey, Istanbul, Bursa, and Gaziantep are the only three cities where the yearly migration rate has increased from one period to the next.

In 1990 the city population of main or metropolitan Bursa was 834,576. However, the urban population in Bursa province as a whole was 1,157,605. Over the last 70 years, a complete reversal has taken place. In 1927, 28.6 percent of the population in Bursa Province was living in city centers in the province while 71.4 percent was living in the villages. In 1990, 72.2 percent of population was living in the cities while the percentage living in the villages was only 27.8 percent. These figures indicate mass migration from the villages of the province as well as from the villages and cities of other provinces in Turkey, including immigrants from South Eastern European (Balkan) countries such as Bulgaria.

Bursa is in the first-degree seismic zone. Bursa experienced its last major earthquake in 1855. Thus, close to one and a half centuries have elapsed since Bursa had a threatening earthquake.

**Bursa Study: Before the 17 August 1999 Marmara Earthquake**

**Procedure**

In the initial phase focus group and in-depth interviews were conducted with all parties delineated as having some real or potential involvement for strengthening community participation in disaster management (i.e., members of the provincial rescue and aid committee; heads of emergency aid service groups; officials from the greater metropolitan and district municipalities; heads or deputies of chambers of civil engineers, architects, and city planners; representatives of various nongovernmental organizations and the private sector; and finally the local media).

**Focus Group Questions and Main Findings**

Five main questions were used in the interviews. These were: **"What are the potential disaster risks in Bursa?"**, **"To what extent is Bursa prepared for such disasters?"**, **"Who is responsible for mitigation and preparedness?"**, **"Is there adequate community awareness and participation?"**; and finally, **"How can we increase community awareness and participation?"**
The respondents delineated earthquakes as the primary potential risk for Bursa. Floods, landslides, avalanches, the volcanic structure of Uludag mountain and potential risks related to this, forest fires, pollution due to industry, house fires, and erosion were also mentioned.

In response to the question, “To what extent is Bursa prepared for such disasters?”, respondents emphasized two opposing views. Those believing that Bursa is not prepared proposed that the building codes are not abided by, that there are poor quality buildings and there isn’t adequate supervision and enforcement of building codes, and that there are violations of the urban plan. They also stressed the view that community members lack awareness about risks. It was also pointed out that in case of a disaster the provincial and local authorities will be victims themselves and will not be able to function efficiently. Those expressing the view that Bursa is prepared stressed that the Local Agenda 21, an organization under the main municipality in the framework of the U.N. Rio Summit 1992, has potential power in creating sustainable community participation. They also pointed out that the emergency and service groups are ready for disasters.

The responses to the question, “Who are responsible for mitigation and preparedness?”, mainly delineated provincial authorities, municipalities, technical chambers, and finally the community members. Therefore, the discussions revealed that disaster management is perceived as the responsibility of actors from different sectors.

The responses to the question “Is there adequate community awareness and participation?” revealed a generally negative outlook. The responses centered on lack of awareness and the fatalistic and individualistic approaches prevalent in the community. Some, however, believed that the community is sensitive but that there are no proper organizations to get their participation. Finally, in response to “How can we increase community awareness and participation?”, the local media and its potential role were stressed. Furthermore, panels, conferences, and booklets on disasters were proposed as means to increase awareness. Local Agenda 21 and its neighborhood offices established under this agenda were seen as a very powerful mechanism to enlist and strengthen community participation.

The Second Phase: Formation of a Multisectoral Working Committee

The focus group and in-depth interviews showed that there are favorable attitudes towards bringing together the provincial and local
authorities, the nongovernmental organizations, and the private sector in order to establish community networks. We have observed that this mechanism has already some beginnings with the establishment of the Local Agenda 21, which is a global initiative set up during the 1992 Rio Summit Meeting of the United Nations. Our interviews also pointed out that it might be appropriate to restrict our initial work to earthquakes. Therefore, under the facilitative leadership of the Local Agenda 21, a volunteer working group, having members from various sectors was formed. This group was presented with a very general draft action plan based on the interview data. The group met a couple of times; however, the momentum was not very strong. It was evident that this form of collaboration was a new concept. Furthermore, the voluntary nature of the committee work and lack of financial support seemed to be hindering factors. The committee delineated the need for educational materials for the community members and a trainer’s guide to be used in conjunction with this material. However, they were reluctant to prepare such material locally, emphasizing the lack of funding and their other commitments. They proposed that the development of these will take time and will necessitate financial resources and asked the research team to prepare these materials. So, upon the request of the work group, the research group, based at a university in Ankara, the capital of Turkey, prepared a pamphlet and a training-of-trainers' manual. Although the researchers applied to various institutions for funding, at that stage it was not possible to get support for the printing costs of these materials. Furthermore, at the time there were elections for the municipality, and as a result, the municipality and the Local Agenda 21 workers all changed. Thus, there was a considerable slowing down of the committee work. Furthermore, we noted a rapid change in bureaucracy. During the time of the study, the vice governor of Bursa in charge of disaster affairs and the Director of Public Works and Settlement changed. Thus, in June 1999 the project seemed to have lost its momentum, and the local community did not seem to demonstrate any ownership of the project. We noted that there was not a great deal of enthusiasm in the province.

**Bursa Study: After the 17 August 1999 Marmara Earthquake**

The 17 August 1999 Marmara earthquake, resulting from the rupture of the North Anatolian fault system, severely affected the most densely populated and industrial area of Turkey. It caused 17,127 deaths and 43,953 injuries. Due to heavy industrial development in the region and related population density and the lack of conformity with seism
codes in building construction, the earthquake led to a great devastation. Apart from the high death toll, injuries, and building damage, it also led to a great psychological suffering among the survivors. The earthquake displaced more than 250,000 people. The extensive damage to reinforced concrete buildings in the earthquake was primarily due to poor quality of construction and failure to enforce building codes. The response of the government to this great devastation was delayed and uncoordinated. The media had prompt coverage of the event, and thus the earthquake and its devastating aftereffects were felt strongly by the majority of people living in Turkey (Bruneau et al. 2000). Bursa is located very near the center hit by this devastating earthquake and felt the earthquake shock to a great extent. Furthermore, the hospitals in Bursa were used to deliver health care to the injured. Thus, as was the case for every region in the Turkey, Bursa was highly sensitized to the risks of potential earthquakes and the reasons behind the extensive damage.

Following the earthquake we came across an increased momentum and interest in Bursa for developing mitigation measures and for community participation. We have observed that there were a number of local initiatives taken for mitigation. The municipality designed several workshops and panels, inviting scientists from different parts of Turkey to deliver speeches on earthquake risk, preparedness, and mitigation issues. Furthermore, a disaster management implementation and research center was formed in the Uludag University, situated in Bursa, following the earthquake. Before the great earthquake, we tried to enlist the collaboration of the departments of sociology and psychology in this university, but they were rather slow to respond. However, following the earthquake, they were impressed by the initiative the disaster center was formed. Furthermore, they showed interest in the educational materials and requested the training-of-trainer's handbook and the pamphlets. They started a program for training trainers to deliver this education to the university staff and to the public. A series of workshops was organized to deliver the training manual to teachers at adult education centers and to representatives of various NGOs. The municipality was also very interested in meeting with us and discussing possibilities of work that can be followed. However, we realized that the new municipality and the new director of the Local Agenda 21 had no institutional memory about the previous working committee. They were surprised to find the minutes of the meetings after we gave them an account of what was done in Bursa during the previous municipality. In summary, there was enthusiasm, ownership, and momentum after the August 1999 earthquake. This supports what has been found previously in regards to
fear/anxiety as being strong predictors of preparedness behavior (Rugemili and Karanci 1999).

There was also strong support from the private sector nationally to support the printing costs of the educational materials prepared by the research team prior to the earthquake. It was ironic that material prepared before this earthquake to prevent what really happened was supplied only after the earthquake. Several different versions, different in the sense of carrying the logos of different supporting organizations, were published. Upon request from several NGOs, we held a number of workshops to deliver the training to their members. The last development in relation to the educational materials, for which we failed to attract funding before the earthquake, has been a grant from European Commission for Humanitarian Affairs (ECHO) and the United Nations Development Project (UNDP). The funding aims to strengthen the coping capacities of the Marmara earthquake survivors by training 15 central trainers, who will then train 200 local trainers to deliver the training to 200,000 earthquake survivors.

Lessons Learned and Conclusions

In this study our aim was to see how local organizations could be set up so that the local populations will be ready for disaster before it strikes. The final aim was to develop guidelines for community participation in disaster management suitable for Turkey. Our initial interviews in Bursa showed that it is possible to bring together central government agencies, main or metropolitan municipality and district municipalities, and nongovernmental organizations to increase community participation in disaster management. We have observed that this local need has already some beginnings in the establishment of Local Agenda 21 in Bursa, which is a global initiative set up in 1994 to organize local communities. The study, which was initiated in 1998, started with some enthusiasm due to the preceding Ceyhan-Misis Earthquake of 1998; however, this was unfortunately short-lived. The main reasons seemed to be lack of seed money or any other initiatives, the voluntary nature of the working committee, some friction between parties involved, and short-time memory of local earthquakes such as Dinar 1995 and Ceyhan-Misis 1998. Although during the interviews there was an agreement on the necessity of local multisectoral involvement, in actually there was hesitancy in developing alliances. The public sector held the belief that disaster management issues are their domain. The local elections further hindered the progress of work.
The public blamed the municipality for engaging in such a project for increasing their popularity in forthcoming elections. Furthermore, the public sector believed that disasters are serious events and one should not ask for the participation of the community members. Thus, the top-down approach to disasters and the emphasis placed on disaster preparedness with the exclusion of mitigation was evident. The project was not owned, and the responsibility for developing educational materials was given to the research team. However, the devastating earthquake of 17 August 1999 changed this picture greatly. Due to the sensitization created by the aftermath of this earthquake, we witnessed ownership and local initiatives. Furthermore, the public and the private sectors showed interest in the educational materials, and funding became abundant.

Before the August 1999 earthquake, the momentum for the development and the implementation of mitigation and preparedness action plans was difficult to sustain. Some of the reasons behind this were the rapid turnover in bureaucracy, the lack of financial and other initiatives, and the voluntary nature of the work. Compared to a similar though large-scale initiative of building disaster-resistant communities by FEMA in the U.S., our pilot study entailed no seed money. There was also no tradition of community participation in disaster mitigation and preparedness in Turkey. The occurrence of the devastating earthquake showed that a good window of opportunity for initiating projects for community participation is when fear and anxiety are high. However, fear and anxiety on their own cannot act as sole motivators in the long run. Funding, building collaborations, and local ownership are areas that need to be worked on in future attempts for building community participation. We are hoping that Bursa will be prepared for a disaster through the local organizations that will involve men and women as individuals and households as groups in community networks. Local Agenda 21, which has already been set up in Bursa, seems to be a good potential leader for such an initiative. However, the workers of the Local Agenda 21 admitted that they do not know how to involve local people in such networks. Community participation in these new forms is not readily forthcoming. Old forms of community participation should be unearthed, and new forms should be devised and implemented.
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