

TITLE: Social Vulnerability Research Against to Disasters for Istanbul

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SUMMARY/ABSTRACT

Executive Summary

Istanbul has been exposed to many earthquakes at certain intervals throughout history and these earthquakes have caused great losses. In the light of scientific studies and experience, it is predicted that a possible earthquake will be affected Istanbul in the near future. The unmanageable extent of a possible disaster in Istanbul plays a decisive role in the prioritization of activities aimed at reducing risk, so every step to be taken must make an effective contribution to resilient cities. For this reason, in order to understand the impact of the studies to be carried out on disaster risk, it is necessary to determine, define and examine the disaster risk with all its dimensions.

When the literature on disasters is examined, it is seen that disaster risk is considered as a whole of the concepts of "hazard" and "vulnerability". The concept of hazard is used in response to a natural or human-induced event (earthquake, landslide, flood, chemical leak, etc.) that causes a disaster. Vulnerability is expressed as the level of possible losses due to the hazard they are exposed to due to the fragility of the physical environment, society or administrative systems. By analyzing the concepts of hazard and vulnerability in an integrated manner, the level of disaster risk is determined.

In studies investigating the dimension of disaster risk that is seen that qualitative and quantitative characteristics depending on the type of hazard are primarily examined. For example, in earthquake hazard analysis, details such as the physical characteristics of the fault structure that caused the earthquake and its past activity are investigated. However, in order to predict the impact of this earthquake, the concept of vulnerability needs to be analyzed.

The concept of vulnerability is generally accepted to consist of four different but complementary sub-components. These are classified as physical, social, economic and administrative components. In the most general terms, the physical component includes superstructure and infrastructure damages, loss of life and injuries that may occur as a result of a potential hazard. The social component, on the other hand, is a concept that aggravates the physical effects of the disaster and includes the impact of the hazard on the individual and society (such as health problems, economic difficulties, the process of returning to normal life, education). While examining the economic dimension of disasters, the total economic loss that occurs on a macro scale due to a possible disaster is defined. The administrative component, on the other hand, includes the elements for the management of disaster risk and the administrative factors of the process (business continuity, disruption of institutional functioning, legal regulations, financial requirements, etc.) are addressed.

When compared to concepts such as "hazard", "physical vulnerability" or "economic vulnerability" in the disaster literature; It is seen that the concept of "social vulnerability" is a relatively new subject and has not been studied as much as other subjects. The biggest reason for this is that the concept of disaster was accepted as a situation related only to the magnitude of the natural hazard. In addition, physical or economic losses caused by hazards are visible, tangible and measurable. Social vulnerability is related to the characteristics of the social structure. Since it is directly related and has a complex content, it is more difficult to examine, evaluate and associate with disaster. For this reason, the experiences gained in the past disasters, the changes in the social structure as a result of the disasters, and the observations and data on the way society is affected by disasters have an important role in understanding social vulnerability. In line with this information, it has been determined that the level

of "social vulnerability", which defines the characteristics of the society that determines the process of preparing for hazards, fighting the challenges and then healing process, increases or decreases according to certain characteristics of the society (income, age group, education level, etc.).

In this general framework, the "social vulnerability" has been discussed, based on the "Social Vulnerability Survey The research carried out is a component of the Megacity Indicator System Project for Disaster Risk Management (MegalST). It is aimed to determine the level of social vulnerability against a possible earthquake-induced disaster in Istanbul.

The "Social Vulnerability Research against Disasters for Istanbul" was designed and carried out within the framework described above. Research consisted of the stages of determining the sub-indicators of the concept of disaster-oriented social vulnerability, determining the necessary data, designing questionnaires to obtain these data, conducting surveys, and analyzing and interpreting the results of these surveys.

The most critical stage in the conduct of the research was the design and modeling stage. At this stage, disaster-oriented social vulnerability indicators were determined by using both past studies and current literature, and which data could be obtained depending on these indicators. The critical point is to ensure that the agreed data is determined entirely on the basis of the disaster scenario that may arise as a result of a possible earthquake. The similar approach was also applied when determining the minimum number of samples to be obtained from the neighborhood.

After the design and modeling of the research; A survey study that was the most labor-intensive stage was carried out. Survey work was conducted in all neighborhoods in Istanbul over a sample covering 50274 households with the address information obtained from TUIK with the random sampling method, and the questions in the questionnaires consisted of closed-ended questions. Questionnaires in each household, having the knowledge and skills to represent the household, was carried out with an adult individual and the "Computer Assisted Face to Face Interview (CAPI)" method was used. With the help of web-based software, household survey entries was made simultaneously with face-to-face interviews.

In the final stage; according to the survey results, statistical analyzes were made, sample weights were calculated and the social vulnerability level was determined for each administrative unit (neighbourhood). In the analyzes, 7 clusters that can be used to measure vulnerability and criteria belonging to each cluster were created and a total of 53 variables were determined. Then, 53 variables were converted into scores between 0-1; for each digit, these variables are coded as "damageable", "top-mid-damageable", "mid-bottom vulnerable" and "not vulnerable". In the calculation, first of all, seven clusters were considered one by one. Accordingly, households with a social vulnerability score lower than 40.00 are "not vulnerable", households with a score between 40.00-50.00 can be moderately-low damaged, households with a score between 50.00-60.00 can be moderately-high damaged, and those with a higher than 60.00 points "classified as "damaged". These analysis results were converted to maps to visualization of the results.

One of the most fundamental findings of the study was the determination that people's value judgments have an undeniable importance in social vulnerability. The fact that people do not expect to be harmed by natural disasters in general, they do not gain awareness of risk perception, and the widespread belief that "disasters are a punishment of God" in society are among the reasons that negatively affect the need to reduce disaster risk. It is seen that the predominance of a fatalistic understanding in society in general also affects the preparation process negatively.

Vulnerability Point	District Ranking
Vulnerable districts (total vulnerability score of 60 and above districts)	•Sancaktepe (61.60)
Moderate-upper vulnerable districts (with a total vulnerability score of 50.00-59.9 districts)	<ul style="list-style-type: none"> •Sultanbeyli (57.24), •Sultangazi (56.70), •Esenler (53.05), •Çekmeköy (52.93), •Ataşehir (52.89), •Bağcılar (52.49), •Arnavutköy (51.95), •Gaziosmanpaşa (51.94), •Esenyurt (51.58), •Çatalca (51.26), •Bayrampaşa (50.95), •Fatih (50.79), •Güngören (50.73), •Zeytinburnu (50.67), •Ümraniye (50.60), •Beyoğlu (50.46), •Kağıthane (50.45), •Avcılar (50.44), •Küçükçekmece (50.42), •Beykoz (50.31), •Eyüp (50.22), •Üsküdar (50.11)
Moderate-lower vulnerable districts (total vulnerability points 40.00-49.99 districts)	<ul style="list-style-type: none"> •Şile (49.88), •Bahçelievler (49.21), •Sarıyer (49.03), •Şişli (48.95), •Silivri (48.64), •Büyükçekmece (48.06), •Başakşehir (47.53), •Pendik (46.50), •Kadıköy (46.31), •Kartal (46.18), •Bakırköy (45.83), •Maltepe(45.06), •Adalar (45.05), •Beşiktaş (43.38), •Beylikdüzü (43.38), •Tuzla (42.68)
Districts that are not vulnerable (total vulnerability score of 39.9 and below districts)	There are no districts in this category.

This research has provided important data in order to combat these issues and to carry out studies that strengthen the risk perception and attitude of the society in general. The results of this study states that anyone who explains the earthquake as a destiny or anyone who believes all kinds of responsibility against the earthquake risk belong to the public administration increase social vulnerability. One of the striking findings of the study is that the vulnerability of households that are relatively stronger in demographic and socio-economic terms may increase due to their risk perception and attitudes. In other words, it has been determined that the socio-economic status of the households is high but their risk perception and attitudes are not at the same level and therefore they may be socially vulnerable.

It is seen that the majority of the research group has a high tendency to see the earthquake as a public risk rather than an individual risk. In terms of preparation for possible risks, the tendency to externalize risk is high and it is seen that the level of preparation for a safer social environment and future is low.

Another important result of the research is that the level of awareness about earthquakes should be increased. The fact that the earthquake risk is not seen as a problem in terms of the present time, since it is a risk of the future rather than the existing time, also presents an important expansion. In this context, it is seen that the most effective factor is the media. The most basic reason for this is the lack of trust of the society in the management level and the tendency to obtain the most basic information about disasters from the media. For this reason, it has been seen that there is a need for a reliable earthquake awareness study, but in meeting this redress it should not be overlooked that a complex process that includes political, economic, social and individual parameters should be managed.

Although the concept of social vulnerability is considered to be a concept that should be studied more frequently, especially in Turkey. In the light of the experience gained in this study; it can be emphasized that it is necessary to develop the clusters that constitute social vulnerability, cluster indicators and the relations between clusters with different perspectives. Although the indicators developed within the scope of this study have the potential to be valid for many cities or regions, it should not be forgotten that these indicators are a reflection of the current time, place and conditions, and it should not be overlooked that different methods and contents may need to be adopted in each different study. In this direction, Revisions and updates must be carried out for the social vulnerability analysis depend on characteristics of different cities or regions during the process of social vulnerability studies.

Another important point is that it is necessary to know that social vulnerability and socio-economics are closely related even if they are not the same thing. For this reason, it should not be overlooked that efforts to improve socio-economic status may also reduce social vulnerability. But more importantly, reducing social vulnerability will not only help improve socio-economic status but also contribute to making our cities more livable, sustainable, safe and resilient against hazards. Therefore, it should be noted that socio-economic status is only one component of social resilience.

On the other hand, studies on resilience should be carried out with a holistic approach in order to support social structure.

As a result, a database that can represent the whole of Istanbul on a neighborhood scale was created in details with a high resolution and the social vulnerability of Istanbul against a possible earthquake

was determined on a household basis during this study. It is mentioned that this research is capable of contributing from various aspects to all practices aimed at reducing disaster risk. The foremost of these is to establish a relationship between the social structure and the physical condition/quality of the city, thus enabling the disaster risk to be analyzed in a holistic way. In addition, these outputs will be beneficial for studies related to urban renewal, urban transformation and risk reduction.

Thanks to these study outputs, it is possible to identify the more vulnerable segments of society against disasters. It gives a chance to set a course for making these segments more resilient, making prioritization of policies and strategies.

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