

Earthquake Preparedness and Cultural Heritage Losses: The Case Study of Istanbul Museums

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Resumen

Medidas que deben adoptarse contra los terremotos - La pérdida del patrimonio cultural: estudio de caso sobre los museos de Estambul

El 97% del territorio de Turquía se halla en una zona geográfica de alto riesgo sísmico. Por lo tanto, hay muchas posibilidades de que en los próximos treinta años se produzcan terremotos, especialmente en la capital, Estambul.

Esta ciudad es la más poblada de todo el país y cuenta con numerosos museos instalados en monumentos históricos, a donde acuden miles de visitantes a diario. En colaboración con diversos institutos de investigaciones, se han elaborado varios proyectos relativos a las situaciones de emergencia que puedan darse en los museos. Esos proyectos atañen a la formación del personal, las actividades de conservación en el contexto de seísmos, la gestión de desastres, etc.

Résumé

Mesures à prendre face aux tremblements de terre - vers la perte du patrimoine culturel : étude de cas dans les musées d'Istamboul

97 % de la Turquie se situe dans une zone à haut risque de tremblements de terre, ce qui justifie les probabilités élevées pour que cette catastrophe naturelle se produise sur ce territoire dans les trente prochaines années, notamment à Istamboul. La capitale rassemble le plus grand nombre d'habitants du pays et regroupe de nombreux musées installés dans des bâtiments historiques où des milliers de visiteurs passent tous les jours. Plusieurs projets en rapport avec les situations d'urgence dans les musées ont vu le jour notamment dans le domaine de la formation, de la conservation sismique, de la gestion des catastrophes, etc., en collaboration avec des instituts de recherche afin de les préparer aux différentes éventualités possibles.

Introduction

Natural disasters can cause loss of human life and an economic crisis, and also losses of irreplaceable cultural heritage. Earthquakes can mean instantaneous destruction without warning, causing extensive and often irreparable damage to cultural heritage.

In Turkey, earthquake is the highest risk of all natural disasters. According to seismologists, 96% of Turkey is in the earthquake zone. The damage from the 1999 Izmit and Duzce earthquakes in Turkey is proof of their power and devastating force. However, there was some positive outcome from these events: the two major earthquakes made authorities and museum professionals realise that an earthquake can destroy the irreplaceable heritage of Istanbul which is exhibited and stored in museums. Turkey has therefore begun to review and reformulate earthquake and hazard planning.

Earthquakes in Istanbul

588 earthquakes occurred in Istanbul between 400 B.C. and 1894 [Sakin, 2002]. Earthquakes that have damaged Istanbul over the last 2,400 years have been significant, but the major faults near Istanbul are probably late in their earthquake cycles as there have been no major shocks since 1894. According to scientists, the probability of an Istanbul earthquake will go up to $62\pm 15\%$ over the next thirty years and $32\pm 12\%$ for the next decade [Parsons, Barka, Toda, Stein and Dieterich, 2000].

Scientists believe there will be an earthquake in Istanbul in the near future so museum professionals must learn to improve earthquake preparedness to protect museum staff, visitors, buildings and collections.

Istanbul Museums

Istanbul, which has the highest population in Turkey, also has the highest number of museums. There are some 66 museums in Istanbul containing historical and cultural heritage and attracting thousands of visitors a day. The museums of Istanbul come under different institutions such as the Ministry of Culture and Tourism, the Turkish Assembly General Directorate of National Palaces, the General Directorate of Military Forces, Istanbul Municipality, the General Directorate of Foundations, and the University; there are also private museums. The museums in Istanbul house different types of collections such as archaeology, history, ethnography, painting, sculpture, industry, Turkish and Islamic art and military collections.

Earthquake Preparedness in Istanbul Museums

Since the Izmit and Duzce earthquakes in 1999, the "Museum Disaster Preparedness Programme" has been conducted by Bosphorus University, the Kandilli Observatory and Earthquake Research Institute and the Disaster Preparedness Education Project. The aim of the programme, launched in September 2000, is to provide education and support for Istanbul museums to encourage them to undertake disaster preparedness and protection for their staff, visitors, buildings and collections.

Another project, which began in July 2003, is entitled «Seismic Conservation of Historical and Cultural Treasures of a World City: Sizing the Need and Formulating an Action Plan for the Museums of Istanbul, Turkey». It is a six-month project supported by the ProVention Consortium and designed to determine the need for non-structural risk mitigation in Istanbul museums; it also involves the production of educational references and hands-on guidance material to help initiate preservation efforts in a systematic way.

The project compiles and classifies examples of non-structural risk mitigation measures taken by museums worldwide; it is preparing an educational multimedia presentation explaining non-structural hazards and mitigation methods for museum collections in storage and on exhibit, is developing a survey instrument for museums to help the project team collect information on seismic preservation needs, and is gathering information on technical, financial, physical, human and other resources in the museum in question, while also assessing its impact on the local economy, organising a workshop with representatives of the museums of Istanbul and other stakeholders, visiting fifteen museums selected to see different types, management and collections, and to summarise the findings, drawing up a report to inform authorities of the scope of non-structural mitigation work which is needed in the city's museums; it is also providing suggestions on how to organise such work.

The Kandilli Observatory and Earthquake Research Institute of Bosphorus University (Disaster Preparedness Education Project) have organised the following seminars, meetings and workshops in the field of museology:

- a seminar on "Emergency Disaster Plan and Earthquake Preparedness", was held in October 2000 at Topkapi Palace Museum. Mr. Wilbur J. Faulk, senior project manager at the J. Paul Getty Museum, gave a lecture to the museum staff, together with other museum directors and professionals in Istanbul;
- the "Earthquake Emergency Plan Meeting" was held in cooperation with the Kandilli Observatory and Earthquake Research Institute and Yildiz Technical University (Museum Studies Programme) at the Topkapi Palace Museum on December 6, 2000. The target audience was museum directors and professionals from Istanbul museums and library directors;
- Dr. Jerry Podany, conservator of antiquities at the J. Paul Getty Museum, gave a four-day workshop in May 2001. The workshop on "Necessary Precautions in Museums Against Earthquake" focused on hazard assessment, seismic protection of exhibits and seismic protection of collections. It also provided hands-on exercises with the Topkapi Palace and Istanbul archaeological museums;
- a "Community-Based Disaster Mitigation Best Practices Day" was held on June 20, 2003, with sessions on basic disaster awareness, community disaster response, school disaster preparedness, health sector disaster preparedness, museums and cultural preservation, structural mitigation, non-structural mitigation, media and education, and neighbourhood disaster preparedness.

The participants concluded that the seminars, meetings and workshops had been extremely helpful. Several museums followed up with "Basic Disaster Awareness" training for their staff in Istanbul and the following museums have started work on earthquake preparedness, both in exhibition galleries and storage areas.

Topkapi Palace Museum

Topkapi Palace was not only the residence of the Sultans, but also the administrative centre of the Ottoman Empire between 1478-1839. It is a

complex of separate houses and gardens covering an area of 82,000 m² [Onder, 1983]. Topkapi Palace was converted into a museum and opened in 1924 on the order of Atatürk. It comes under Ministry of Culture and Tourism, has 14 permanent and temporary exhibition galleries and approximately 86,000 objects in its collection. Topkapi Palace is the most visited museum in Istanbul.

After the Izmit earthquake on August 17, 1999, a seismic survey of the Topkapi Palace Museum was conducted by structural and seismic engineers. Earthquake preparedness for an earthquake expected in Istanbul started on October 1, 1999, with the precautions described below.

The museum began anti-earthquake preparation, starting with the unique and more fragile objects. In the exhibition galleries, certain objects were removed from the display cases and precautions were taken to stop them falling on one another; sand bags were used and some of the showcases were covered with plastic sheeting. In the storage areas, certain objects were removed from shelves and placed in boxes; steel cupboards were attached to the wall.

The Imperial Treasury Exhibition Gallery was completely renovated and fitted to cope with the earthquake hazard. The renovation project was done by paying attention to earthquake mitigation. New showcases were put into niches, which were part of the museum building; the lighting system was taken out of the showcases, and number of objects exhibited was reduced. Those on display were all placed in Plexiglas casing and fastened with monofilaments.

“Earthquake Hazard Hunt” forms and information cards on basic disaster awareness were distributed to all museum staff. By 2000, the museum staff were taking part in seminars, meetings and workshops run by the Kandilli Observatory and Earthquake Research Institute and covering the basic principles of disaster management training, community disaster volunteer training.

Dolmabahce Palace Museum

Dolmabahce Palace was built between 1843 and 1856 and was the third largest Ottoman Palace in Istanbul. From 1909 until the dissolution of the sultanate in 1922, Dolmabahce Palace retained its status as an official imperial residence. The Palace was converted into a museum in 1979 and has a surface area of 110,000 m². It comes under the Turkish Assembly General Directorate of National Palaces.

Emergency preparedness training, focusing on the before, during and after stages of an earthquake, was given to museum staff. Museum evacuation plans were developed and all members of staff were informed of them. Civil defence exercises were conducted periodically by civil defence professionals with the museum to protect the lives of museum staff and visitors in the event of an earthquake. Most museum staff attended the seminars, meetings and workshops of the Kandilli Observatory and Earthquake Research Institute.

Before the 1999 earthquakes, a seismic survey had been made of the museum building. After 1999, museum professionals focused more

on earthquake preparedness. In the exhibition galleries, most of the porcelains were strengthened with museum wax and monofilament, and paintings were fastened to the wall. In the porcelain storage area, the shelves were all attached to the wall and fastening devices were used to prevent the shelves tipping and falling. Metal rail systems were used to store paintings.

Sadberk Hanim Museum

Sadberk Hanim Museum is the first private museum in Turkey. It is comprised of two separate buildings and has a total of 4,280 m². Because of new acquisitions, it was decided to purchase a second building and the new museum building opened in 1988. The total exhibition area is 625 m² [Anlagan, Anlagan, Gunsenin, Yilmaz and Akalin, 1995] and the collection has some 17,000 objects.

“Earthquake Hazard Hunt” forms and information cards on basic disaster awareness were distributed to all museum staff. Staff attended the seminars, meetings and workshops of the Kandilli Observatory and Earthquake Research Institute.

Before 1999, the shelves in the storage areas were all bolted to the wall. Glass objects in the archaeological section were attached to a base using museum wax. Most objects were secured by placing them in Plexiglas casing and some pieces in the Iznik tiles and ceramics exhibition galleries were fastened with monofilament. In the storage areas with both archaeological and Turkish-Islamic art objects locks were used on the cupboards, contoured casing elements were cut from soft Ethafoam blocks to hold and protect fragile objects, other objects were placed in boxes or cases and netting was used on the shelves.

Rahmi Koc Industry Museum

Rahmi Koc Industry Museum is the first major museum in Turkey dedicated to the history of transport, industry and communications. The museum has two historic building complexes on the shores of the Golden Horn. The Museum was opened in December 1994 and the first phase rapidly outgrew itself, so in 1996 another building was purchased and opened to the public in July 2001. The museum has more than 11,000 m² of exhibition galleries.

Museum staff attended the seminars, meetings and workshops of the Kandilli Observatory and Earthquake Research Institute.

Double-sided sticky tape was used in some of the exhibition galleries to secure small objects in showcases. Monofilament or thin steel wire was used to secure larger, moveable objects in showcases, e.g. telescopes. In the near future, more fragile objects in the exhibition galleries will be attached using different methods. Plans also include the storage areas where shelves and cupboards will be secured and objects placed in contoured casing.

Conclusion

After the 1999 earthquakes, very few objects were damaged and none of the museum buildings in Istanbul suffered damage, but Istanbul museums must be well-prepared for the expected “Istanbul Earthquake”.

Thanks to the disaster awareness programmes, training programmes, workshops and seminars in the field of earthquake preparedness, the custodians of the rich heritage in the region are well aware of and genuinely concerned about the risk.

Many precautions are needed to mitigate the effects of earthquake. Expensive technology has been developed around the world, but many practical and inexpensive measures can be taken. In addition to the efforts by the museums mentioned above, Hagia Sophia Museum's seismic survey has been continuing and the Beylerbeyi Palace Museum, Istanbul Archaeological Museum, Turkish and Islamic Art Museum have started to work on the mitigation of earthquake hazards for their staff, visitors, museum buildings and collections.

Each of the museums which have already started work on preparedness, have different management structures, museum facility areas, content and size of their collections, but their precautions have points in common. They have been taking practical, easy and inexpensive precautions against earthquake hazard.

However, it is now time to make these precautions and earthquake preparedness programmes more widely available to all Istanbul museums and indeed to all Turkish museums, and to assist the sector in prioritising and developing practical risk mitigation action plans both structural and non-structural.

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