




# Disaster Impacts and Risk Reduction Measures in Library Structure and Functions

## Kütüphane Yapı ve Fonksiyonlarında Afet Etkileri ve Risk Azaltma Önlemleri

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### öz

*Dünyada çok sayıda afet ve acil durum yaşanmaktadır. Bunun başlıca nedenleri olarak iklim değişikliği ve kentleşme sayılabilir. Gittikçe artan sayılarda kırsaldan kentlere olan göç ve endüstriyel faaliyetler daha çok insanın kentlerde yoğunlaşmasına neden olmaktadır. Bunun doğal sonucu olarak daha fazla insan doğa kaynaklı afet tehdidi ile yüz yüze gelmektedir. İnsan etkileri kaynaklı acil durumlar ve riskler de bilgi merkezleri olan kütüphaneleri tehdit etmektedir. Aynı anda çok sayıda insan bulunan bu merkezler özellikle de doğal kaynaklı afet etkileri altında çok hasar görebilir niteliktedir. Bunun başlıca sebepleri arasında yoğun insan kitlesinin aynı anda bulunması, bina ve ekipmanlardan kaynaklı problemler, deprem, yangın ve sel afetlerine karşı yetersiz önlemler, kütüphane dermesinin afetlere karşı kırılgan yapıda olması, yetersiz hazırlık çalışmaları sayılabilir. Çalışmada bilgi merkezlerinden kütüphane yapılarında meydana gelebilecek doğa kaynaklı afet etkilerinin araştırılması ve bu etkilere yönelik koruyucu risk azaltma önlemleri ile afet sloganları aracılığı ile afet farkındalığı vurgulanmıştır*

**Anahtar Kelimeler:** Afetler; Afet Yönetimi; Kütüphane, Bilgi Yönetimi, Kriz Yönetimi.

### ABSTRACT

*There are many disasters and emergencies in the world. The main reasons are climate change and urbanization. Migration from rural to urban areas is increasing day by day, and industrial activities cause more people to concentrate in cities. As a natural consequence of this, people face the threat of natural disasters. Emergencies and risks caused by human effects also threaten libraries, which are important information centers. These centers, which have a large number of people at the same time, are very vulnerable, especially under the effects of natural-oriented disasters. The main reasons for this are the presence of a large population at the same time, problems arising from buildings and equipment, inadequate precautions against earthquakes, fires and floods, the fragile nature of the library collection against disasters, and inadequate preparedness. The effects of natural disasters that may occur in library structures as well as the preventive risk reduction measures for these disasters, disaster awareness through disaster slogans are emphasized in this study.*

**Keywords:** Disasters; Disaster Management; Library, Information Management, Crisis Management.

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## 1.PREFACE

Libraries are information centers and users can spend a long time in these places to access information. Some libraries are not independent spaces, but may serve within a cultural center or structures with different functions. Natural oriented disasters that threaten information centers cause irreparable heavy damage or destruction in collections. However, not only the unique information resources presented to users and visitors are destroyed, but also results that cause damage to buildings (Kuzucuoğlu, 2021: 818). In libraries, which are areas where users, employees and people for other purposes are concentrated, it is necessary to be prepared for disasters in order to prevent heavy damage and losses from likely disaster effects.

When disasters such as earthquakes, fires, floods, and storms occur in certain periods due to the geographical structure of the regions, their capacity to produce disasters, and the vulnerability of structures, they cause negative effects on libraries. Each natural disaster has its own characteristics and nature. Recognizing these features, predicting the destructive forces of disasters and taking measures to prevent losses and damages with a proactive approach. Increasing information and awareness about the causes and nature of periodic disasters such as floods, human oriented fires and earthquakes ensures that losses are minimized.

Accurately predicting and modeling the occurrence and development of natural disasters supports the following practices: Drawing attention to potential danger/hazard sources and possible risks to library users, staff and people (working/residing around the library), detailed hazard hunting/risk analysis studies related to natural disasters. Taking risk precautions, limiting people and objects that may be harmed, and developing the fastest and most effective intervention methods at the human/collection/building scale.

The construction of the library building should also be done in accordance with the design. In the usage phase, the responsibilities of people for the before and after the disaster, from the manager of the building to the library staff, should be documented in advance. Therefore, every library should have a disaster plan specially prepared for it (Küçükcan, 2008: 39).

Disasters in the OECD (Organisation for Economic Co-operation and Development) Earthquake Risk Report is defined as: “Disasters with potentially long-lasting, multi-generational effects present a broad spectrum of human, social, financial, economic and environmental impacts. Financial management of these impacts is a significant challenge for individuals, businesses and governments in developed and developing countries” (URL 3).

It is necessary to take measures to eliminate the negative consequences of natural disasters through struggle and intervention that will reduce human losses and material damage. It should be ensured that these measures are carried out more effectively, both with inter-institutional cooperation and with the conscious actions of employees / users.

For this reason, improving the response equipment in the library structures, increasing the intervention capacity, establishing early warning systems, defining the rules explaining how people should behave in a likely disaster, and putting them into practice with exercises are the primary studies that must be done. With a more participatory approach to be created in this way, a “library model that actively struggles with disasters” can be adopted.

## 2. PURPOSE

Libraries have a purpose of providing information to the society with their buildings and collections. In addition to these functions, libraries also have a mission to protect the collections that are the memory of the society and to convey them to future generations. Within the scope of the study, it is aimed to determine the risk reduction strategies by emphasizing the disaster awareness studies and for these places to be open to the negative effects of disasters.

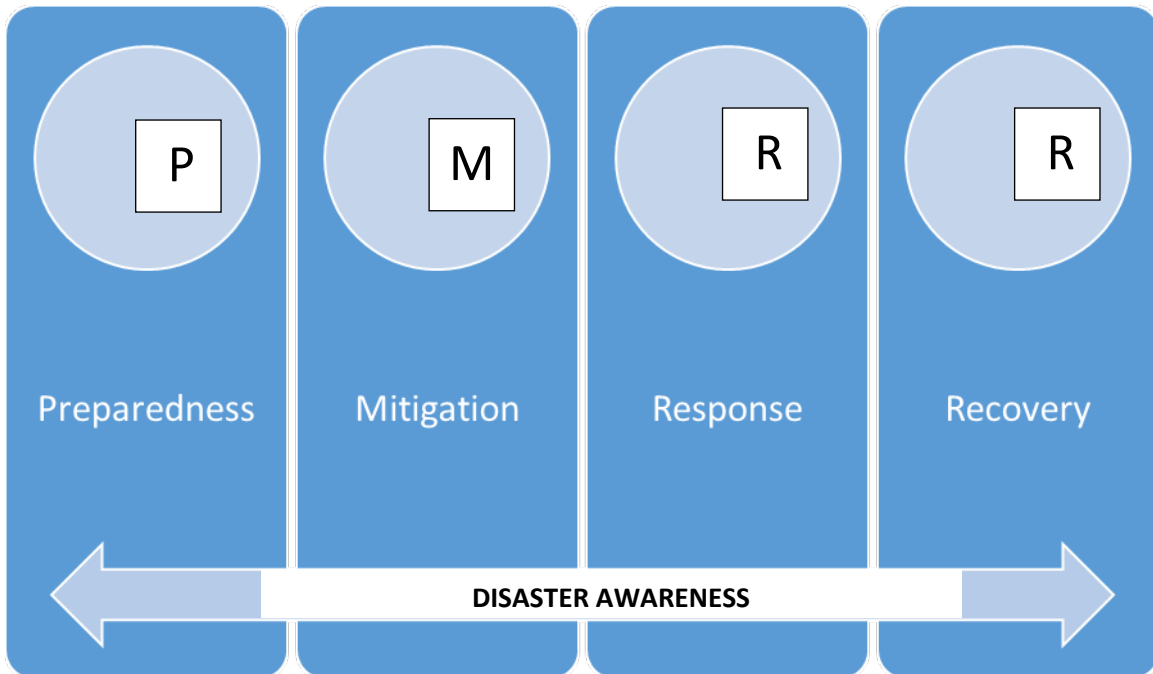
## 3. SCOPE

Within the scope of the study, the importance to increase the disaster awareness of library managers, employees and users was emphasized in order for libraries, which are one of the important information and cultural centers, to maintain their functions in disasters.

## 4. METHOD

In the study, risk reduction measures for the protection of library buildings and collections against disaster effects were focused and determined as a method. Therefore, this research, which aims to identify problems and applications, is a survey type study that reveals the existing situation. The focus is on catchy basic words that staff and library users can easily apply. Within the scope of the study, protective measures were given for disasters such as earthquake, fire and flood.

Creating disaster awareness for the four important phases of disaster management, namely preparation, mitigation, response and recovery will lead to further success. Disaster awareness training should be included in each of these stages. Training of the public (local residents and those using the information centers and employees), posters, health and safety signs, warning signs should be part of these trainings.



**Figure 1:** Including disaster management and its stages and disaster awareness at all stages

## 5. DISASTER AWARENESS IN LIBRARIES

In the OCCUPATIONAL HEALTH AND SAFETY LAW numbered 6331, which was adopted on 20/6/2012, the following provision is included in Article 4, titled the employer's general liability:

"The employer is obliged to ensure the occupational health and safety of the employees, and within this framework;

a) Employer works for the prevention of occupational risks, taking all kinds of measures, including training and information, organizing the organization, providing the necessary tools and equipment, adapting health and safety measures to changing conditions and improving the current situation (URL 5).

The following provision is included in Article 5 of the General liability title of the HEALTH AND SAFETY SIGNS REGULATION, which is one of the sub-regulations of this legislation: "According to the results of the risk assessment carried out in the workplace, in accordance with the first paragraph of Article 10 of the Occupational Health and Safety Law No. 6331; In cases where it cannot be removed or reduced, employer keeps the health and safety signs and ensures that they are used in appropriate places (URL 6).

Libraries are also workplaces, and according to this legislation, awareness should be increased with safety signs as well as with training activities. In the study of Ansar Hussain in 2019, it is stated that libraries are under threat due to natural or man-made reasons, that libraries are constantly prepared for disasters, that most of the libraries proactively implement equipment and building preventive maintenance, training programs, etc. emphasized that it is constantly taking place in libraries (Hussain, 2019).

Aboyade et al., in their study of the level of disaster preparedness in university libraries, revealed the following conclusions: There is a need to increase the knowledge and awareness of staff on disaster management measures in libraries, that this issue should be a constant priority in libraries, and that regular training of staff should be adequately provided. If all similar measures are taken, it will maximize the chances of reducing or even preventing unnecessary destruction in the event of a disaster (Aboyade et al., 2021).

In the study examining the disaster preparedness activities of librarians in Nigeria, it was stated that the preservation of disaster preparedness and information materials is important, disaster perception is generally a function of awareness. It has been stated that the preparedness activities undertaken to protect information resources against corruption or complete loss are not sufficient, and the level of disaster preparedness awareness among librarians in developing countries is low (Ilo et al., 2020).

## 6. DISASTER RISK REDUCTION MEASURES IN LIBRARIES

In information centers where many people are concentrated at the same time, precautions for emergencies should be handled sensitively. Emergencies develop suddenly and cause chain reactions, causing much damage and loss of life and property. In information centers, planning studies should be carried out at the scale of both the employee, the user and the collection and collection (Kuzucuoğlu, 2017: 334).

In the conclusion part of the study of Jerome Idiegbeyan-Ose and colleagues in which the effects of disasters on libraries, the following opinions were given:

“Librarians are rapidly adopting new methods that extend the life of collections. Institutions in developing countries, including libraries; It is experiencing difficulties due to insufficient funding, corruption, sabotage, poor working conditions and low level of information technology. This means that most libraries in developing countries are not adequately prepared for disaster management; such libraries have no chance of surviving in a disaster situation” (Idiegbeyan-Ose et al. 2020:30).

In the principles of the International Federation of Library Associations and Institutions (IFLA) (Adcock, 1998: 19), it is emphasized that it would be beneficial to prepare an information booklet for all employees, that this booklet should include the following topics and what to do in these emergencies:

- When an accident occurs to staff or visitors
- In case of theft, brutality and attacks
- In case of power cut, elevator breakdown, loss of security keys and similar situations
- In emergencies that endanger the health of people and collections and the structure of buildings (such as a bomb explosion)
- When a hurricane, earthquake and flood warning is received

In the research on emergency planning for earthquakes, Beinhoff emphasized eight different “preventive earthquake preparedness” activities carried out by the library staff before the likely earthquake (Beinhoff, 2008: 71-72).

- Structural hazard assessment and mitigation work for the library building
- Non-structural hazard assessment and mitigation study for library materials and furniture
- Emergency response training for library staff
- Supply of emergency equipment
- Establishing exercises and earthquake awareness habits in the library to respond quickly for an earthquake
- Development of earthquake damage assessment strategy
- Preparation of cleaning plan rules
- Documentation of earthquake damage.

The American Library Association's (ALA) Organizational and Operational Policies guide includes the following statements under the heading "Disaster Relief": "When a disaster occurs that affects one or more libraries, it is recommended that staff or colleagues of these libraries contact the ALA for assistance. This assistance will include: (1) Providing information to the public about the impact of the disaster on the library and where contributions can be made (2) Providing information to the library on dealing with disasters (URL 1)".

Cravey explains in his book “Protecting Library Staff, Users, Collections and Facilities” that the concept of “Physical Security” includes the following elements:

Site selection, neighborhood, boundaries, building design, parking lot design and location, sidewalks, access roads, exterior lighting (including parking lots), landscaping, fences, main entrance design, wheelchair access, front door type, interior door type, lobby security, staircase and railing design, glass use, interior lighting, emergency lighting, emergency stairwells, walls, fire doors, locks and keying, elevators, break rooms, sign systems (including Braille), book returns, audible, inaudible and flashing alarm systems, evacuation plans, broken windows, graffiti (Cravey, 2001).

In libraries, as in all workplaces, secondary disasters such as fire and infrastructure damage can develop after disasters. In order for libraries to fully function after disasters, they should develop rapid response techniques against unexpected and sudden events.

While developing these techniques, the characteristics of the geographical region where the library is located and its vulnerability to disasters should be evaluated. For this, it is necessary to determine the structural and non-structural features of the building. This risk analysis should be done from the basement to the roof of the building. In this regard, technical support should be obtained from many disciplines such as expert engineers, architects, occupational safety specialists.

Serious losses occur in earthquakes due to the inability to choose non-structural materials appropriately, not paying attention to their installation, and not being able to periodically control the modern materials that emerge with developing technologies. The quality of workmanship and the aging of the material also accelerate these damages. After disasters, very serious damage occurs in libraries in many parts of the world. In the 1983 Coalinga, 1994 Northridge, 1989 Loma Prieta, 2010 Canterbury New Zealand earthquakes, many museum and library buildings were damaged by non-structural materials (FEMA, 2011).

Critical areas of the building that can be damaged in a likely disaster should be determined. Furnitures, ventilation heating and cooling systems installed in the building after the construction phase, should be checked for seismic stability. For installation and maintenance works that require engineering, service should be obtained from specialized engineering companies.

The emergency / disaster plan work to be carried out before the earthquake and the preparatory work to be carried out in accordance with this plan will bring disaster safety together, and the library will provide a safety climate. The formula for this can be expressed as:

#### **PLAN + PREPARE= DISASTER SAFETY**

Systems such as fire detection and earthquake sensors should be installed, alternative water sources should be created around the building, and the number of hydrants should be increased.

All library staff should participate in periodic drills on emergencies and disasters, and their colleagues should form a chain that will know each other's phones and addresses. All employees should be aware of emergency contact information so that they can reach the relevant phones in case of a disaster. Contact information of stakeholder institutions should also be known. Before a possible emergency, emergency evacuation floor plans should be drawn and hung in the library, and all library personnel should learn the locations of primary and secondary evacuation doors, emergency assembly point, fire extinguishers and emergency evacuation exit doors in the facility. In addition, the locations of water and natural gas valves and electrical switches should be marked to be reached in emergencies and disasters, and drills for these areas should be carried out.



**Figure 2:** Ahmet Süheyl Ünver Public and Children's Library Emergency Evacuation Plan (A Kuzucuoğlu archive).

Alternative means of transportation should be explored. If a damage has occurred in the collection or the building in the library, the action steps required to eliminate the problems and reactivate the systems and equipment should be defined in advance.

The task distribution of the personnel who will work in the event of a disaster and how they will coordinate with the other teams in the institution should be defined.

Emergency teams, equipments and training activities should be defined, and they should always keep their information up-to-date and active with periodic drills.

Information center employees develop the necessary skills for successful evacuation only during such exercises (Rossol, 2014, p.47). Persons assigned to information centers should be informed about what to do during and after the disaster, and should be prepared for all conditions with an applied in-service training (Küçükcan, 2012, p. 167).

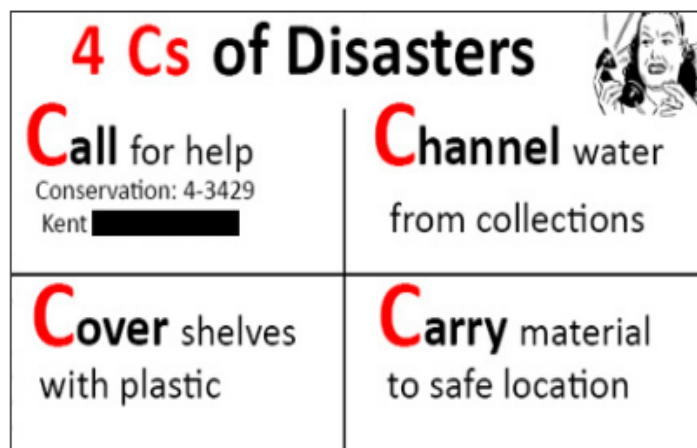
It should be ensured that inventory records of the equipment that will be needed in disasters are kept, insufficient materials and equipment are provided, and sufficient budget is allocated for them.

Each library has its own unique location and conditions. For this reason, the library disaster action plans to be prepared should be developed based on the conditions of the library. For example, information such as which collection will be evacuated first in a likely fire should be included in these action plans.

Existing disaster plans should be tested with studies based on different scenarios according to disaster diversity. Pre-planned preventive and limiting measures will allow possible damage to be kept to a minimum.

Who and what can be affected by disaster action plans? How can it be affected? The question should always be asked. What measures can be taken after the answers to these questions are found? Answering such questions is essential. Kansas University Library Emergency Response Unit has developed an application called 4C in this regard. Conservation Service responds to emergencies in the seven library buildings of the University and coordinates the "Collection Emergency Response Team", which consists of library staff in each library. Collection Emergency Response Team members participate in disaster preparedness and recovery training, monitor the use of disaster kit consumables, and help keep disaster plans up-to-date.

The Unit has developed an emergency card, called the 4Cs, that anyone can keep on their phone, wallet or office, outlining the simple steps anyone can take in an emergency. Developed by the Kansas University Library, the 4C card consists of "CALL for Help, CHANNEL water, COVER shelves, CARRY materials to a safe location". A more catchy message is given with illustrations and slogans (URL 2).



**Figure 3:** 4 C’s of disaster (Source: lib.ku.edu)

During the fire, pull the pin, which is the set of words mottoed acronym as PASS, , which stands for "Pull, Aim, Squeeze, and Sweep" should be applied. Each library staff should be aware of the use of fire extinguishers and fire hoses, and adequate training should be given with the exercises to be carried out before a possible disaster. An emergency response equipment cabinet should be kept ready in the library at all times.





Figure 4: PASS slogan for a fire drill (A. Kuzucuoğlu archive).

R.A.C.E. is also another acronym in case of a structural fire. There are four essential steps:

- Rescue/Remove anyone from immediate danger to a safe area
- Assess the situation and pull the nearest fire alarm. Contact Switchboard with Code/Campus/Location
- Confine the fire by closing all doors/windows
- Extinguish the fire or evacuate the area (URL 4).



Figure 5: RACE's 4 essential steps (Source: <https://www.wrh.on.ca>)

During the evacuation, the slogan of ATTENTION (DIKKAT in Turkish) “Do not turn, Do not Push, Do not Run, Do not Talk, Do not be Hurry, Follow” should be applied by all library staff and users in order to prevent injuries/death in case of panic.



**Figure 6:** Suggestion for a library drill- ATTENTION (DIKKAT in Turkish) slogan (A. Kuzucuoğlu archive).

In the study of Kostagiolas et al. for academic libraries in Greece in 2020; Disaster management in academic libraries is not completely neglected but not taken seriously, it has been emphasized that the level of disaster preparedness is insufficient due to a number of side effects, such as including the economic crisis, lack of personnel and equipment maintenance activities, inadequate buildings and insufficient funding. As a result of the survey conducted with library directors, the question of disaster effects was answered as follows:

- Collection damage: 32%
- System damage: 15%
- Equipment damage: 14%
- Building damage: 14%
- User injury/death: 3%
- Employee injury/death: 3% (Kostagiolas et al, 2011)

According to this study, it is understood that collection damage is at serious rates, and studies are needed to reduce structural and non-structural risks.

## 7. CONCLUSION

Neglecting safety rules in libraries causes work accidents and serious consequences in emergencies / disasters. Training efforts to increase the awareness level of both librarians and library users will limit the effects of occupational accidents or emergencies. It is important to develop health and safety signs, warning posters, slogans, which are among the educational materials, for before, during and after emergencies.

In libraries, emergencies and disasters can occur suddenly at unforeseen times. Being constantly prepared and raising awareness should always be a priority.

Library structures and collections can be easily affected by disasters due to their nature. The answers to the following questions should be sought for strategies that can be developed to minimize the effects of natural disasters:

- What are the natural disasters that can affect libraries?
- What are the characteristics of these disasters?
- What are the current dangers?
- Where are the easily damaged areas in the building?
- What are the intervention and struggle action rules of employees and users in emergencies and disasters?
- Are disaster drills held regularly?
- Have emergency action plans been prepared?

Libraries, which are the memory of the society today and in the future, are places open to the use of all age groups and risk groups. It should be the duty of all authorities to ensure that libraries are safe and healthy against disasters. All disasters were not counted in this study. Separate risk assessment studies and emergency plans should be prepared for all disasters that may affect a library building. Fire brigades are preparing the emergency response plans for the critical buildings of their administrative boundaries. In these plans, the following should be determined: water resources that can be used during a possible fire in a building, hydrant tanks and chemical extinguishers to be used against fire. Therefore, it is important that libraries and cultural centers receive support from the local fire department and share their plans with the fire department while making these plans. Hazard hunting should be done in participation with the fire brigade. Slogans for each disaster should be developed and these slogans should be adopted by users and employees during the drills. These slogans should be designed for before, during and after the disaster.

Each of the mitigation and preparation stages in risk management, and the response and recovery stages in crisis management should be meticulously implemented, and all work should be documented. With the implementation of the issues specified within the scope of the study, libraries should be prepared for emergencies and disasters.

Preservation of precious artifacts, which are very important for the urban culture of human beings, should be ensured. National and international standards, regulations and laws should be examined and followed, and a priority order should be established in which collections should be saved/treated at the time of/after the disaster. Cooperation with national and international institutions in the field of preventive protection should be established, and periodic seminars and workshops should be held with experts in the field.

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