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Earthquake Park Design and Some Examples from the World and Turkey

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Abstract: Earthquake parks which enhance the quality of life and ordinary cases, increase the welfare of society as well as gathering in emergency / shelter will be used as parking areas are functional and designed to meet their immediate needs. So the planning of parks has a very important place for earthquake disaster management. When we look topography structure of Turkey, because of hosting the major fault lines, also deemed necessary the existing green areas (parks, recreational areas etc.) must be capable of converting the earthquake parking in case of a disaster and have adequate equipment for this situation. In this study, emphasizing the importance of earthquake parks in the world and in our country examined some available earthquakes parks and parking issues must be considered in the earthquake planning were investigated.

***Keywords**: Earthquake Park, Landscape Planning, Housing, Disaster*

Introduction

Nowadays, rapid growth of cities and unplanned progress of the process increases the risk of earthquakes. Although earthquakes area natural disaster, they are not only caused by the mechanism of the earth. From the time in which people started to live in settled community to the recent, the inference of human to the nature is main reason of the transformation of earthquakes to disaster.

Problems Emerging with Earthquake and After

Earthquake is a natural event that occurs as a result of the suddenly emergence from the slowly accumulating energy. In addition; although the earthquake was investigated as a subject of many scientific studies, but it was not yet fully understood in all aspects, time, location, size(severity, magnitude) properties of the unknown, is not inevitable and can be defined as the expected natural phenomena. Any other natural phenomenon does not threaten humanity so much uncertainty. For this reason, earthquakes should be considered in the study for a natural event which does not recognize the boundary (Demirarslan, 2005). Problems that arise after the earthquake, it is possible to examine four main headings as psychological problem housing problems, financial problems, institutional problems.

Housing problem: Increasing high population in urban areas in the world and Turkey, earthquake, flood, tsunami, natural events such as hurricanes, resulting in massive destruction in many urban areas rather than rural areas. In large urban disasters, the physical infrastructure of the city housing, public buildings, places of production and consumption undergoes destruction, today crisis live in urban social system that has gained a complex nature. In this case, after disaster, reconstruction and to ensure social and economic return to make life normal operation as soon as possible attempts more important (Konur et al., 2011; Ishikawa, 2002).

The building environment and housing, beyond connection needs access to public consumption of services is also one of the main tools makes it a priority in achieving a normal functioning of the social system to solve the housing problems after the disaster. With the possibility of providing shelter peoples/ families to daily living activity can return to their function in the relations of daily production (Konur et al., 2011; Ishikawa, 2002). In the other case, the continuation of the post-disaster state of chaos of different groups, with conflicting demands as a result of the emergence of social conflict is inevitable. Therefore, until the passing permanent settlement, the victims of housing and access to public consumption of services must be temporarily provided (Konur et al., 2011). Temporary shelter and settlement option scan take different forms according to the changing conditions in present time.

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Temporary placement and temporary housing usually conceptually without separating each other are used interchangeably. However, temporary shelter/ housing and settlement forms, the type of disaster carries different characteristics depending on the geography and climate conditions to the size of the demolish, the size of the affected population, the time required for reconstruction. In this context, temporary placement of after-disaster; emergency housing, temporary housing, temporary and permanent placements in residential that can be analysed in four stages (Konur et al., 2011).

Financial problems: After the earthquake difficulties are experienced to requirement of people eating and drinking, shelter, health and etc. in connection to the needs of an adequate level. This is the necessary for storage and quick access to encounter problems, people should be aware of this issue by developing the procurement method. After the earthquake, people lost the belonging house, other thing etc., to minimize the financial troubles, after disasters in order to support the process of complete recovery for sheltering, food, institutions involved in meeting the health needs and are required people's cooperation work (Konur et al., 2011).

Institutional issues: Institutions must be in a sufficient degree of cooperation in order to meet the material and moral needs of all survivors after the earthquake. As the largest NGO, has taken over the disaster preparedness and response missions in Turkey Red Crescent, is conducting a voluntary system for years. The Red Crescent disaster volunteers, they not response only live in the neighbourhood scale but serving in the professional disaster team. The Red Crescent is now on the basis of its capacity to develop awareness-raising on behalf of volunteers and community leaders for their efforts to reduce the risk of branches (Karancı, 2011).

Psychological problems: Earthquake, as well as the structural devastation created in regions where it is located, deeply shake people's lives and is a natural disaster with creation serious psychological effects. The aid provide dafter the earthquake are mainly life rescue, treatment of physical injuries, improving the provision of shelter and infrastructure. More complex and long-term psychological impact of the detection process and treatment, the damage in this area, often are resulting in the leaving their own into (Karancı, 2011).
During the 1999 Izmit-Istanbul, 2004 Indonesia, 2005 Pakistan and 2011 Japan earthquakes, in together with the many life and loss of property, as psychological destruction where people live, with the help of increased communication tools are laid all before the world's eyes (Karancı, 2011).

Earthquake Awareness
Every individual, earthquake and to raise awareness about the danger screated by other disasters, how to reduce the danger in which it to educate you can do individual to introduce the stages of disaster preparedness and individuals to encourage to take the necessary steps to prepare for disasters and all individuals in the disaster to help him see the whole as part of a preparatory education projects should be prepared. To raise awareness of the disaster, to prepare ourselves and our surroundings next to a disaster, the main objectives of the training to be provided should include (Çavuş, 2011).
•create awareness about the dangers of earthquakes and other disasters for each individual,
• Every individual person must be educated how to reduce the danger,
•To introduce the stages of disaster preparedness and to encourage individuals to take the necessary steps to prepare for disasters,
• Each individual, to help him see himself as part of a whole. (Çavuş, 2011).

The World Seismology
Earthquake can occur any place, at anytime. Considering the magnitude earthquakes in the world each year, which is around 3.5-4million earthquake. About 1000 of this earthquake is making destruction (Karagöz, 2010). The largest earthquake ever measured the world is 1960-GreatChileEarthquake. According to among the Richter scale 9.5magnitude, 4000 and 5000human life lost this earthquake (Çavuş, 2011; Karagöz, 2010). Earthquake centre was capital city Santia go where Valdivia city located about700km south of Chile. Earthquakes spread cause tsunamis in the Pacific Ocean (Karagöz, 2010). When ranking earthquakes from the most violent in the world countries are exposed such as the highest following the first 7countriesrespectively;1-Japan, 2-China, 3-Iran, 4-Turkey, 5-Pakistan, 6-

Asia, especially in the southern parts of the continent, 7-west coast of the continental United States (Chilein South America) (Anonymus, 2014).

World's Existing Earthquake Park Example

Earthquake Park the Project in Configuration Location area after Hanshin Earthquake

6398 people were died at Great Hanshin earthquake occurred in theyear1995 and110 117 buildings were destroyed completely. Small parks and open space in high-density areas, as emergency gathering are a played an important role in preventing the spread of fire. The following chart shows that after the earthquake, people how to uses mall parks (Yasui, 2007; Orhon, 2002).

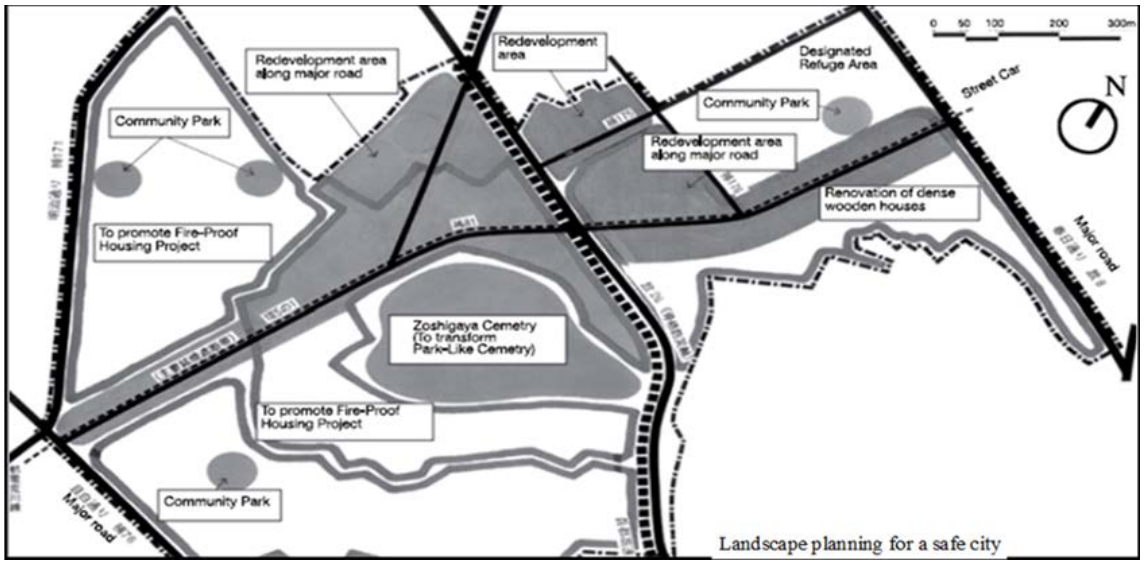

Figure 1. Hangshinearthquake park sample (Yasui, 2007)

Table 1.Purpose of the in Kobe City Parks after Great Hanshin-Awaji earthquake (24-25 Jan. 2006; Yasui, 2007)

Parks numbers		Remaining Parks	Recent use parks	Usage Purpose				
				Meeting	Support activities	Support centre	Hostage	Total
Small parks	1000	151	47	23	13	1	0	37
	1000-2500	95	49	31	26	0	0	57
	2500	54	40	36	36	2	0	74
Area parks		31	24	17	33	6	2	58
District parks		11	9	6	13	3	0	22
Multiple aimed parks		5	3	0	4	2	0	6
Others		20	4	4	0	1	0	5
Total		367	176	117	125	15	2	259

After the Great Hanshin Earthquake in reconstruction work has been to strengthen the basic elements park system in the plan. In addition to this park, many earthquakes are made. Implementation of this project was completed in 6 years in 2001, and the park has been completed its application to secure the city as a result of the earthquake (URL,1).

Seismicity of Turkey

Turkey is located in Alpine-Himalayan seismic zone earthquakes, which happening earthquakes are the Atlantic Ocean to spread to both sides of the ridges is related to north-north-eastward movement of African-Arabian plate. North Anatolian Fault and East Anatolian Fault, such as certain large fractures in these jams continue to mobilize millions of years, is the main cause of earthquakes up today. North Anatolian Faultis1400-1500km long (Karagöz, 2010)

21.5% of Turkish population lives in the first degree and 31.4% in second degree earthquake region. The average number of deaths in the earthquake in Turkey since the establishment of the Republic of year 1923, while about1,000 people in year, the last Izmit and Düzce earthquake, about 1300 persons are death in45 seconds with earthquakes and property damage cannot account status. For these reasons the earthquake; worth checking out is the most important natural phenomena. Because we have not available scientific research and technology, when and where earthquakes would take immediate measures to ensure that it is not possible to predict for us. Furthermore, earthquakes of this uncertainty, them easures to be taken requires that the aggregate of the ball. Earthquake is a human problem not the only problem in our country (Karagöz, 2010; URL, 1).

Earthquake Park Planning and Required Equipment for Earthquake Park

Some important elements in the planning of the earthquake parking

- In the city, accessible points and a sufficient number of safe space evacuation area must create to perform the functionality (Bulut and Atabeyoglu, 2010).
- Density state capable meeting areas for needs should be selected according to the needs and disaster immediately after the selected field will contain functions expected.
- Actively working to meet the recreational green space needs and desires of the people before the earthquake, should be open to use by making functional with the necessary equipment in use after the earthquake (Şengezer and Özkahraman, 1996).
- At least one, earthquake park should be planned, including in the neighbourhood.
- Immediately after the earthquake, earthquake parking attendants trained to be organized very quickly, as well as experts from the local park where each person should be trained by elected officials. Things to work for a large number of people should be established to recycle in working plan.
- Earthquake parks should produce tangible spiritual solution in time to revisit old levels in people's life and social activities after the disaster.
- In the city, applicable places should be identified and people should be informed about it.
- The area may stop in case of danger of an individual only standing place is 0.5 m² and might need accordingly maximum of 50 m² an area to close to the technical infrastructure in these areas (water, toilets, maintenance, etc.) addition to help prevent confusion among those who suffered disaster when needed (Demirarslan, 2005).
- In the context of preparedness against earthquakes, after the earthquake, which is very important part in maintaining the vital functions of open and green space should be planned.
- The green areas for public as demands and needs of active recreation before the earthquake, green space standards should be increased, taking into account should be functional with the necessary equipment after earthquake.
- To ensure safety especially after the earthquake to meet immediate, needs can be made of the intervention, the green fields of the displaced urban service should be places where normal life again performed.
- Earthquake parks should be installed in separate collection pints in city centres established other than outside the park. As can be rearranged existing parks as earthquake parking or private outdoor green spaces should be designed with these issues (Aksoy et al., 2011;URL 6).
- Throughout the city centre is accessible many park points need to set up before earthquake, for the creation from available this area, but the expansion on the low capacity park and with necessary technical equipment must be provided.

Necessary units should be present in Earthquake Park:

Collection Areas, Sports Facilities, Ramps Generator, Sofas, Management and Computer Centre, Parking places, Heliport, Bath etc.

Sample Available Earthquake Park in Turkey

Esenler Earthquake Park

Esenler Earthquake Park; in basketball court, children's playground, picnic area, recreation area, amphitheater, fountains, toilets, showers and are part of a neighbourhood park with a helipad (URL, 2). There is a separate function of each chapter; in an earthquake in the generator into play, one can be

made logistics and personnel 5 door entry to be used for input. Planned use of existing as well as new areas of parks in the area after the disaster to ensure the health and quality of life standards are integrated into the project. Earthquake in the area of 19,000 m^2 park created to be used in post-disaster; -Sahr Hospital (20 patients capacity-Surgery-psychological supports Patient Tracking), the Administrative Unit (Internet-based Computer Hardware), Heliport, 2 total 2320 m2 tent area (700 people), Storage Area, Kitchen-Dining Hall (1000 people), Laundry - Dishwashers, Children's Playground, 336 KWA generator, 3,000 m3 water tank is positioned to be used if possible negativity to live. Another function of the skating rink used by the children in the park; tools is the use of materials quickly for downloading. Basketball court can be established immediately in the large tent outside the normal function of the crisis, and this area will be used as a hospital or exceeded-house. Picnic areas, the crisis turned into instant tent will be used as a shelter. Amphitheater of the disaster management unit is said to use instantly. The parking lot was carried out to be able to park the vehicle on a regular basis from the time of crisis. Helipad, emergency transportation, wounded transplantation, and so on. Come for the purpose helicopters will go to the needs of the people in the bar were also considered when designing; park toilet and shower cubicles (URL 3;URL 5).

In the project; helipad, where to store water and food ingredients, in emergency response for tools and equipment and blankets for compulsory residence, stoves, etc. such as equipment, food alerting equipment, etc. can be used by the transport vehicles being shipped parking, loads of tools to download and overlay can be a loading ramp, transformed to the basketball court to the emergency hospital in case of earthquake, indoor facilities to meet the heating requirements (store is available.), closed spaces can eliminate the toilet and bathroom needs, indoors can be installed Portable Kitchen, Lighting system, fountains, telephone centre.

Aykut Barka Earthquake Park

Aykut Barka earthquake activity park was planned as a recreation area, than designed to meet people the needs of pre-disaster and post-disaster (URL 4). The fields used as basketball and volleyball courts before the disaster, relief teams have been suggested as areas where they can set up first aid equipment.

Freedom Earthquake Park

Freedom Park, a short time period for public care after the disaster, is planned to be converted into housing areas and meeting area (URL 4). At Freedom Earthquake Park; there are 7 separate WC and shower, Missing Information Area, 9 wells, 95 pieces of hydrants. Also there is in pin boards for information in the gates area and public healthy park to be established within the service area with signage and will be quickly reached for the people.

Freedom Park is planned to meet a short time after the disaster in public care to be converted into housing. Planned use of existing as well as new areas of parks in the area after the disaster to ensure the health and quality of life standards are integrated into the project

Aykut Barka Earthquake Park


Esenler Earthquake Park


Özgürlük Earthquake Park

Figure 5.Some Earthquake Park examples in Turkey

Results

Earthquake which is the most destroying natural disasters but occurring time is unknown. After the earthquake, damaged homes after the main earthquake destroyed or caused the people who cannot

enter their homes against the possibility of aftershocks, it is necessary to help the housing problems of these people. Preparation of earthquake disaster management in the developing countries such as Turkey are inadequate and often work after the earthquake, seems to focus on the rescue operation. Open spaces should be designed to reflect the integrity and continuity; these areas, housing and other areas usage should be determined according to the optimum distance analysis: The Open-green areas should be designed for responding the recreation requirements and using as an earthquake park when it is necessary rather than their size.

Urban open and green as an indicator of urban spaces in the quality of life and containing many functions, especially emergency access in the aftermath of the earthquake and the collection, storage and distribution of emergency rescue equipment, emergency shelter for tents or temporary housing area seems to have become more important with the emergency case use.

In this regard, this study examined the World and Turkey samples. In the case study showed that within the context of earthquake preparedness planning within the scope of the disaster plans of urban open and green spaces. Frequent earthquakes and many residents work for earthquakes performed country as Japan and Turkey studies were examined in this investigation. As a result of the recent studies showed that it has been seen once more the importance of the enriching of open and green spaces in urban daily life, purposes for exceptional situations are also important for the preparation of requirements as earthquakes park of the city park. However, a survey study of (Aksoy et all., 2011) showed that the people surveyed in this study "The Earthquake park" asked if they had heard of the concept of the speakers, as high as 98 % said they do not know what it means of earthquakes park. After explaining what is the earthquake parks and content, then when asked whether they want to do in the near earthquake park where they live after being told that all of the visitors told they would be live near the earthquakes park (Aksoy et al., 2011).

As a result, the public should be informed about earthquakes and in urban areas with a high risk of earthquakes, a lot of points should be established for accessible for the earthquake park. A lot cities need creation of earthquake park places, available for the located in this area, but capacity is necessary to ensure that the expansion of the lower quality park and after necessary technical equipment performed. Vital sense so important in terms of the disciplines in this regard a number of public institutions and located Landscape Architect of the organization, creating open spaces in urban areas or populations in these open areas to evaluate existing ones, according to the density, planning earthquake parks, including at least one for each neighbourhood should be our primary goal.

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