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Methods of post disaster accommodation in terms of project management: Case of Isparta

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Abstract

There are many faults in Turkey and %93 percent of land, %98 percent of population, %98 percent of industrial area, %95 percent of dams in Turkey carry the earthquake risks. Turkey has encountered with many earthquakes and obtained lessons learned to improve the process of project with respect to supporting rapid accommodation, health, education and any other requirements. Studies have been revealed that after earthquake, three stages have been applied namely, Emergency Stage, Rehabilitation Stage, Reconstruction Stage to help the victims. According to Project Management Institute (PMI), Project Management Process Group (PMPG) consists of initiation, planning, execution, controlling & monitoring and closing. Applying these stages are vital to provide support according to plan. To understand importance of this process group, witness' comments are evaluated, and defined bottleneck throughout providing support. Moreover, efficiency and productivity shall be measured in order to ensure being within time and budget. In this study, after earthquake process is studied in terms of project management. Results are discussed and lessons learned are obtained in order to take measurement associated with post disaster for Isparta- Burdur zone located in the mid-west of Mediterranean, Turkey.

Keywords: Post disaster accommodation, earthquake, rehabilitation period, project management process group, lessons learned.

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1. Introduction

There are many faults containing %93 percent of land, %98 percent of population, %98 percent of industrial area, %95 percent of dams in Turkey. Isparta is located highest seismically active zone like many regions in Turkey. The earthquake zone of the region that we study in this paper is called as Isparta- Burdur being seismically active (Sezer, 1999; Institutional Firms, 2016). Isparta and its surroundings are extremely sensitive against earthquakes. The existing faulting in Isparta is shown in the seismic map given in Figure 1. (Carhoglu et al., 2014). The earthquakes occurred in Isparta region are shown in Table 1. (Yagmurlu, 1997; Akyuz, 2001; Sintubin, 2003).

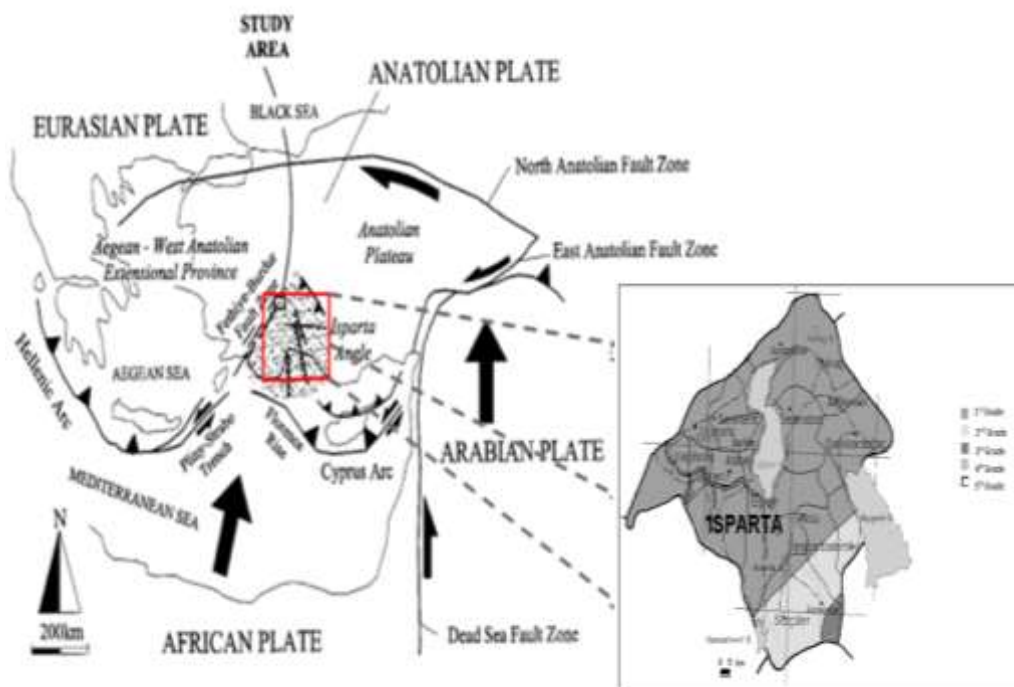


Figure 1. Earthquake hazard zones, active fault lines, Fault map of Isparta (Akyuz and Altunel, 2001; Sintubin, 2003)

Date	Region	Fault	M_s	I_0
The end of the 5th century	Dinar	?	?	?
88 I.O.	Dinar	?	?	IX-IX
53 I.S.	Dinar	?	?	VII-X
The beginning of the 6th century	Isparta	?	?	VIII
The middle of the 7th century	Isparta	?	?	IX-XI
641-668 I.S.	Isparta	?	?	VIII-X
1875	Dinar	Balkan Fault	?	IX-X
1889	Isparta	?	?	?
3 October 1914	Burdur	Burdur Fault	7.1	IX
7 August 1925	Dinar	Balkan Fault	6.0	VIII-IX
1933	Dinar	Balkan Fault	5.8	VIII
12 May 1971	Burdur	Burdur Fault	6.2	IX
1 October 1995	Dinar	Dinar Fault	6.1	IX

Figure 2. Major Earthquakes that occurred in Isparta region (Sezer, 1998)

Last earthquake was in October 1995 as depicted Table 1. There were no procedures related to rescuing and providing accommodation, health, education, food, water and electricity after the post disaster. During the Golcuk disaster, Turkey gave his one of the biggest exam for this matter and prepared some procedures to provide the aid on time. Three stages were defined by Limoncu and Bayulgen (2005) for the process after disaster namely, emergency stage, rehabilitation stage and reconstruction stage. In this study we examine the issues from the project management point of view to improve the best practice for the requirements to do after disaster.

2. Methodology

Well-known geophysicist Ahmet Mete Isikara says that, "Earthquake doesn't kill but buildings" He signed the biggest problems in Turkey. However, Turkey realized that not only buildings but also unplanned rescues also is vital. If earthquake is a risk, there should be risk management plan in order to minimize the effects of demerges.

PMBOK (2013) provides an overview of the Project Risk Management processes, which are as follows:

- a) Plan Risk Management: It is a process that methods for conducting the risk management activities.
- b) Identify Risk
- c) Performing Analysis of Risk
- d) Planning the Risk Responses
- e) Controlling the Risks

Risk management plan should be evaluated together with the "Process Improvement" due to provide best solution to post earthquakes. Process Improvement Plan is part of project management plan. Bottleneck in the project should defined and eliminated. This process can be named as "Process Improvement". Lessons learned is the biggest asset to define the problems in the project. Therefore, previous experiences with respect to earthquake are evaluated to provide best solution in the region of Isparta - Burdur. However, last earthquake was occurred in this region in 1995 and records related to witness and quality and efficiency of fist aid to the earthquake victim are not reliable. Therefore, process applied after earthquake in Golcuk is studied to highlight weaknesses and strengths of process and decide the process improvement areas.

Project Management Body of Knowledge (PMBOK) (2013) define the project improvement as "The process improvement plan is a subsidiary or component of the project management plan. The process improvement plan details the steps for analyzing project management and product development processes to identify activities that enhance their value." Post disaster process applied in the Golcuk and Burdur is intended to be improved through lessons learned.

3. Risk Management

3.1 Risks identification; problems dedicated during emergency stage

It is a process that determination of possible risks effecting to disaster and documenting each possible risk characteristics.

Communication is defined one of the major problem after this disaster. According to research report released in 2010 by Parliament, 18.373 people lost their life, 48.901 people injured in Golcuk earthquake. However, during couple of days after disaster, communication between organization

under ministry was blocked and ministry couldn't control the disaster. Many of death people buried to mass grave without record. Council of Ministers Ahmet Sagar worked between 1999 to 2002 expressed that "we hardly established communication between governors and prime minister at 19:00 on the same day. We learned the magnitude of damage at 11:30. in all aspects of communication has been stopped. Therefore, it is obvious that death and injured is expecting over the reports of government agencies. According to informal information declared by Wikipedia; approximately 50.000 people died, 100.000 people were injured, 133.683 buildings were collapsed, 600.000 people lost their accommodation a 16 billion people were affected from different results of this disaster.

In addition, transportation can be included to major problems occurred after disaster. Ambulance carrying the injured to the Istanbul through the main roads of TEM and E5 were blocked due to other rescue vehicles coming towards them in order to arrive to disaster area. Therefore, both injured and rescue team couldn't achieve their intention on time.

Moreover, another problem identified related to land emergently required for grave and tents (accommodation, health, education, food, storage) couldn't provide on time during the Golcuk disaster. Furthermore, rescuing the people buried under rubble took time due to lack of coordination.

3.2 Performing analysis risk

The process of prioritizing risks for further analysis or action by assessing and combining their probability of occurrence and impact. According the interviewed witnesses living in the Golcuk during disaster, priorities of problems are indicated as accommodation, food, health, education, storage area, communication, transportation respectively.

Probability of the defined problems were high before the Golcuk earthquake. After Golcuk earthquake, some procedures were prepared to reduce the aforementioned risks. However, accommodation is still problem with respect to emergency stage and rehabilitation stage. During the emergency stage, tent town are established. However, this temporary solution before the rehabilitation stage carries risks for health, water, food, education. After emergency stage couple of weeks take to move prefabricated rehabilitation houses. Therefore, this risk should be assessed in order to reduce negative effects.

3.3 Planning the risk responses

The process of developing options and actions to enhance opportunities and to reduce threats to project objectives. Strategies should be developed according to Avoid risk, Control and Mitigate risk, Accept risk, Transfer risk. We can define the risk response as;

Risk Avoidance: It is a basic process to change the plans to prevent from the disaster.

Control and Mitigate risk: When risk is actualized, it is a method to control the risk according to plan in order to mitigate.

Transfer risk: It is a method related to outsourcing the risks to the third party partially or totally.

With respect to tent housing system, it is discussed that how to control risks. As experienced during the disaster that solution of tent house is not the best practice due to containing risks with relates to health, water, food, education, social and psychological issues. Therefore, risk avoidance can be chosen and tent housing during the emergency stage step can be skipped and directly leading the victims to temporary prefabricated house.

4. Process Improvement in Post Disaster

Process improvement steps are defines as;

"Process boundaries" is a process of providing limits of process (from beginning to conclusion), inputs, outputs, internal and external stakeholders of the process. Emergency stage takes couple of weeks depending on the size of the damage.

Stakeholders are identified as victims, Municipality, Ministry of Health, Ministry of Communication, Ministry of Transportation, AKUT (Search and Rescue Association), Police and people came from the other regions to help.

"Process configuration" is a process of providing a graphic depiction of processes, with interfaces identified, used to facilitate analysis.

"Process metrics" is a process of defining the control area and analyzing the process efficiency. It is observed that establishing the tent town, providing the tents, foods, health, transportation to the victims at the outset were disorganized and suffered to provide to the victim on time in Golcuk. After a week, still water, foods, health, transportation, communication and education couldn't be improved as needed.

5. Discussion and Conclusions

In order to develop best practice after the post disaster, instead of tents, temporary housing should be provided to the victim. Firstly, Isparta municipality should provide an area to establish these prefabricated houses. However, these houses should be established beforehand. These houses can be aged over the time and adequate solutions should develop for this matter. It is observed that Isparta needs some storage and working areas for the firms. According to record Isparta has approximately 49.801 firms in 2016 (Earthquake Map, 2016). These firms are potential to hire these prefabricated houses until earthquake disaster. After the disaster rapid evacuate plan for these firms can be applied to accommodate the victims.

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