INPUT PAPER

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NATIONAL FRAMEWORK IN ORDER TO REDUCE EARTHQUAKES BY MULTI-STAKEHOLDER PARTICIPATION IN TURKEY: National Earthquake Strategy and Action Plan of Turkey (UDSEP-2023)

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1. Introduction

Every disaster event is a powerful reminder of no country cannot completely prevent natural disasters. It is also a difficult task to create a society that is completely immune to the adverse effects of natural disasters. It is the primary responsibility of governments to protect its citizens as much as possible from the consequences of disasters and secure public safety. However, what governments can do is limited to several factors like capacity, economy, etc. For this reason, securing the multi stakeholder participation in achieving the DRR has a critical role. Multi stakeholder participation must include almost every level including central, local and individual perspectives. Strategies and plans must also be prepared by considering this approach and must include and give responsibility to the representatives from a wide range of community.

From the history, earthquakes were the main cause for shaping the daily life including economic and political structure of Turkey because of its topographic and geological situation. Turkey has suffered from devastating earthquakes in the past. Even in the prehistoric and historic times, many cities completely rubbished. According to the National Earthquake Zoning Map of Turkey, more than %70 of Turkey's lands is located on 1st and 2nd degree earthquake zones. Majority of the population live on seismically high risk zones and the distribution of this population is mainly concentrated in cities. Like in many countries around the world, urban population has increased very rapidly in Turkey increasing urban risks to manage difficultly. The most populated city of Turkey, Istanbul and the 3rd most populated megacity Izmir are located on 1st degree earthquake zone and several times affected from seismic events.

After 1999 earthquakes, Turkey implemented several earthquake mitigation measures and projects including legislative arrangements, technical capacity development, scientific projects and structural and non-structural mitigation measures. However, all those efforts have not been scheduled to a strategy or an action plan. This paper briefly describes the new strategic approach of Turkey in order to reduce earthquake related losses. National Earthquake Strategy and Action Plan of Turkey (UDSEP-2023) is a national roadmap in order to reduce earthquake related losses by 2023 and achieve earthquake resistant and resilient country within this period of time. By 2015 this strategy has been in effect and tested for 3 years, when this paper was submitted. Every action within UDSEP-2023 has an overall target in order to achieve earthquake loss reduction. Like many other natural hazards, prevention of earthquakes cannot be achieved completely but desired achievement on the reduction of loss of life, property and economy is the main target of earthquake strategy and action plan. Multi-stakeholder participation and realistic and manageable actions was the key both in preparation and managing the UDSEP-2023.

The long term consequences of this roadmap will also be evaluated as an input or lessons learnt for the new HFA (HFA2) during its implementation.

2. Earthquake Hazard in Turkey

Geologic, topographic, climatic features of Turkey make it highly vulnerable to different types of disasters, mainly earthquakes (Image 1). Turkey have been confronted with varying seismic shocks most of them caused enormous casualties and loss of property. North Anatolian Fault Zone, East Anatolian Fault Zone and Aegean Graben System are the main earthquake generating sources in Turkey. In addition to this extensive hazard, unplanned urbanization and construction led to increased vulnerability and hence risks on living areas. The mitigation of risk posed by seismic hazard has been the focus of governmental policies during the last half-century, especially after the devastating 1999 Marmara and Düzce earthquakes. Since the 1950s earthquakes alone have claimed the lives of more than 32 000 fellow citizens.

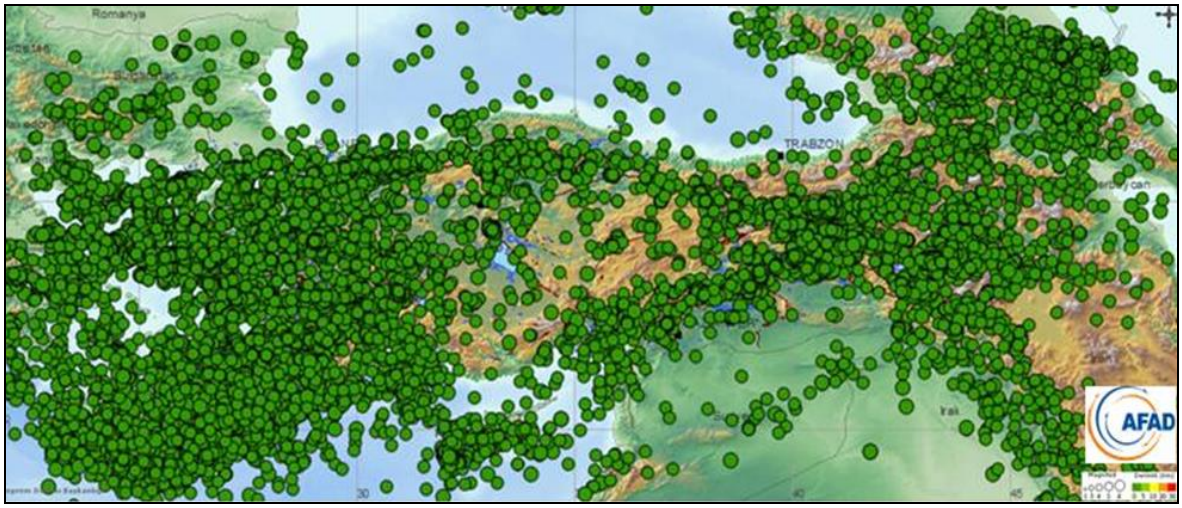

Image 1. Earthquakes with magnitude ≥4.0 in Turkey and surrounding regions between 1900-2013. Source: AFAD National Seismic Observation Network (www.deprem.gov.tr) and AFAD Turkish Earthquake Data Center.

According to the Earthquake Zoning Map of Turkey (Image 2), more than %70 of Turkey's lands are located on 1st and 2nd degree earthquake zones. Zone 1 colored in red illustrates the highest hazard, whereas Zone 5 colored in white illustrates the lowest hazard zone. This map was issued in 1996 with the decision of the cabinet and is still in force. In 2012 active faults of Turkey were published by Ministry of Energy and Natural Sources, General Directorate of Mineral Research and Exploration, and new faults were identified. Renewal of earthquake zoning map studies were initiated by AFAD and new map is planned to be issued by 2015. This map is mainly used for construction purposes and by Turkish Catastrophe Insurance Pool in determining insurance rates.

Following the 1999 earthquakes, several noteworthy risk reduction measures and projects were implemented in Turkey. First steps on DRR were taken during International Decade for Natural Disaster Reduction (IDNDR) period. After 1999 earthquakes several DRR strategies (Strategies on integrated urban development, earthquake risk reduction, climate change, etc.) were developed, legislative arrangements were made (Decree on Building Construction,

Earthquake resistant building codes, etc.) and institutional reconstruction applications (Establishment of Disaster and Emergency Management Presidency—AFAD in 2009) were achieved.

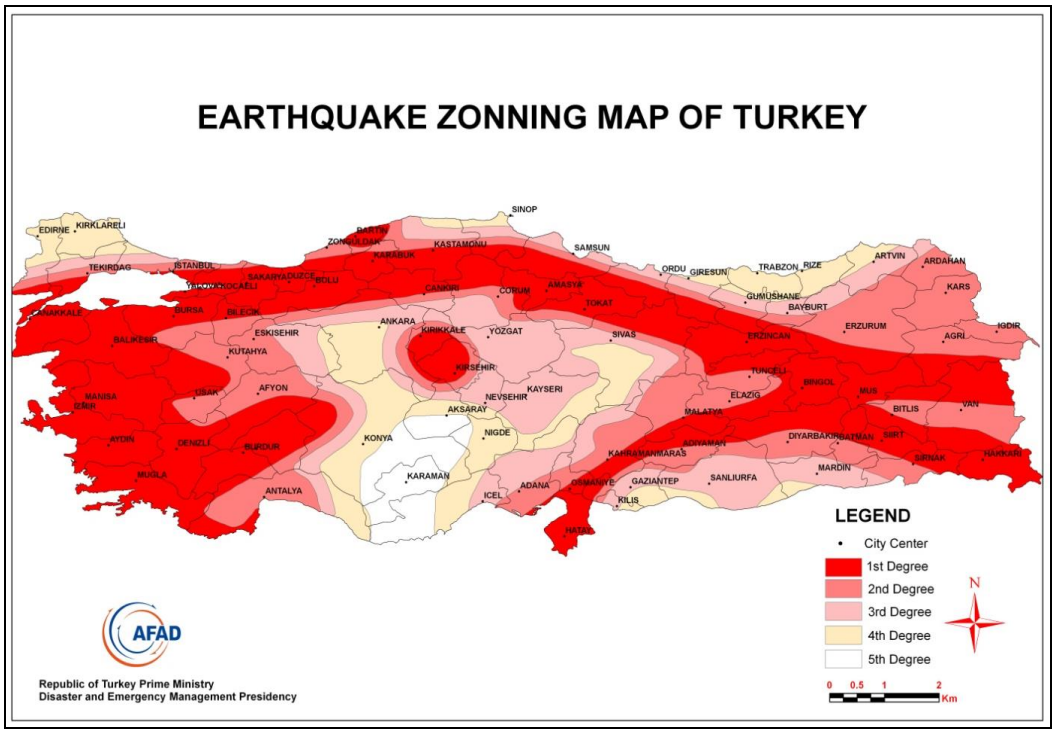

Image 2. Earthquake zoning map of Turkey (Source: www.afad.gov.tr ; www.deprem.gov.tr)

3. Strategic Approach to Disaster Risk Reduction with UDSEP-2023

Strategic planning to disasters are amongst the most important pillars of strengthening disaster countermeasures. Strategic approaches provide some basic advantages like; clarification of roles for actions, collaboration methodologies and measures among primary and secondary stakeholders, time limited actions, putting concrete targets and planning financial outcomes of the actions.

Many countries have gone legislative and administrative changes following major disasters. Japan is a good example to that. Report of Cabinet Office of Government of Japan clearly summarizes this evaluation (Cabinet Office of Japan, 2011). Situation is also similar in Turkey. Following the 1939 Erzincan Earthquake which is the most catastrophic earthquake event after the 19th Century, legislative changes have been regularly updated or prepared considering the recent developments and needs. As an earthquake prone country, Turkey has experienced several legislative changes and amendments following major earthquakes. The latest disaster law has been in force more than 50 years and several changes and amendments have done to that document. However, a document that describes the problems and proposes several solutions within a given time period with all stakeholders was not prepared for earthquake hazard and earthquake mitigation in Turkey.

In 2009, Turkey made a paradigm shift in its disaster management structure. Until 2009, 3 main government units namely; General Directorate of Disaster Affairs under Ministry of Public Works and Settlement, General Directorate of Civil Defense under Ministry of Interior and General Directorate of Emergency Management under Prime Ministry merged together under Prime Ministry with a new department called Disaster and Emergency Management Presidency (AFAD). AFAD is consisted of 8 departments each are responsible from the different phases of disaster management cycle. Being under Prime Ministry, AFAD has an overall coordination role between all stakeholders responsible from disaster management processes in the country.

Following its establishment, AFAD started filling the gaps in legislative and legal arrangements. AFAD also focused in disaster risk reduction (DRR) issues and primary gap identified in this context was evaluated as the lack of strategic documents for DRR. UDSEP-2023 was prepared in order to fill this gap in Turkey for a specific but most important hazard type. Sustained series of activities have been organized during the last decade for the purpose of enhancing the country's capacity to fight against earthquakes, and many reports have been prepared for that purpose. Before 2009, several stakeholders in Turkey prepared investigation reports, special reports and scientific documents on earthquakes and in general disaster management problems (Table 1). During preparation activities, international strategies and action plans were also investigated and benefited like Hyogo Framework of Action (Image 3).

Under coordination of the AFAD Earthquake Advisory Council representatives from an array of public agencies active in the area, academicians and practitioners have joined to prepare a nation-wide earthquake strategy and action plan. UDSEP-2023 prepared by considering the value of previous efforts some of which are listed in Table 1. UDSEP-2023 can be accepted as revision of existing papers, reports, plans to a strategy paper defining the roles, responsibilities and funds clearly within a timeframe.

4. Turkish Experience on National Earthquake Risk Reduction Strategy

Earthquake Strategy and Action Plan is the roadmap of Turkey in order to reduce earthquake related losses by the year 2023 by implementing 87 actions. The strategy document is formed along three principal themes, seven objectives, 29 strategies and 87 action items for which 13 responsible agencies have been designated for implementing the cooperative work (Image 4). This strategy includes 87 actions those will be achieved within 3 time periods namely; Short Term (2012-2013), Mid-Term (2012-2017) and Long Term (2012-2023). The fundamental philosophy of the National Earthquake Strategy and Action Plan-2023 (UDSEP-2023) can be summarized as "achievement of new earthquake-resilient, safe, well prepared and sustainable settlements so that the physical, economic, social, environmental and political harms and losses that may be engendered by earthquakes are prevented, or their effects reduced". The document aims to reduce the earthquake risk and enable a society

that is prepared against this form of hazard through examining the institutional framework for this objective and establish the priorities of the R-D programs on the subject.

Relationship between HFA and UDSEP-2023		HFA Priorities of Action				
		Priority Action 1: Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation.	**Priority Action 2:** Identify, assess and monitor disaster risks and enhance early warning.	**Priority Action 3:** Use knowledge, innovation and education to build a culture of safety and resilience at all levels.	**Priority Action 4:** Reduce the underlying risk factors.	**Priority Action 5:** Strengthen disaster preparedness for effective response at all levels.
TARGETS of UDSEP-2023	OBJECTIVE A.1: ENHANCEMENT OF THE EARTHQUAKE INFORMATION BASE	X	X		X	
	OBJECTIVE A.2: EARTHQUAKE HAZARD ANALYSIS AND REVISION OF HAZARD MAPS		X			
	OBJECTIVE B.1: THE REALIZATION OF EARTHQUAKE SAFE SETTLEMENTS AND EARTHQUAKE RESISTANT CONSTRUCTION	X			X	
	OBJECTIVE B.2: PROTECTION OF THE HISTORIC AND CULTURAL HERITAGE FROM EARTHQUAKES		X		X	
	OBJECTIVE C.1: PUBLIC EDUCATION ON EARTHQUAKES AND OTHER DISASTERS AND CULTIVATION OF ACTIVITIES FOR SOCIAL AWARENESS	X		X	X	
	OBJECTIVE C.2: REALIZATION OF LEGISLATION REFORMS FOR AN INTEGRATED AND EFFECTIVE EARTHQUAKE STRATEGY	X			X	
	OBJECTIVE C.3.1: CAPACITY BUILDING FOR RAPID, EFFECTIVE AND TIMELY INTERVENTION IN EARTHQUAKES AND OTHER DISASTERS	X			X	X

Image 3. Relevance of HFA and UDSEP-2023 (Actions within the objectives of UDSEP-2023 relevant with Priority of Hyogo Framework of Action are marked with "x").

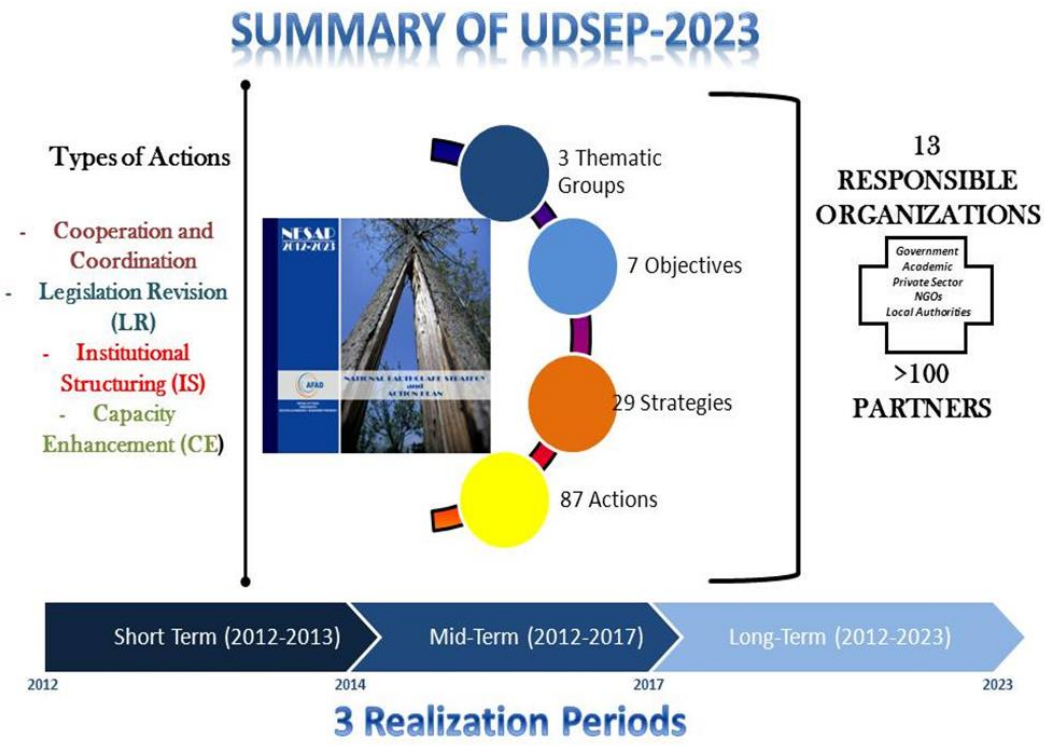

Image 4. Summary of UDSEP-2023.

Table 1. Reports on disaster management and earthquake issues prepared before UDSEP-2023.

Year	Title of the document	Prepared by
1999	National Earthquake Programme	Report of Turkish Union of Geophysics and Geodesy
2000	Special Investigation Report on Disaster Management	Turkish General Assembly
2000	Report of Special Commission for Natural Disasters	State Planning Organization
2000	Report on Earthquakes	Turkish Chambers of Architecture and Engineers,
2002	Report on National Strategy on Earthquake Mitigation	National Earthquake Council
2002	Report on Natural Disasters	Turkish Court of Accounts
2004	Earthquake Working Group Report	Turkish Economic Congress
2004	National Strategy Report on Natural Disasters in Turkey	JICA Turkey Office and Ministry of Interior
2004	Reports of 1st National Earthquake Council	Ministry of Public Works and Settlement
2005	National Earthquake Investigation Programme Report	Scientific and Technological High Commission Report No:11
2008	Supervisory Committee Report on Disaster Management	Prime Ministry
2009	Disaster Preparedness and Urban Risk Management Commission Report of Urbanization Council	Ministry of Public Works and Settlement
2010	Special Investigation Report on Reducing the Effects of Earthquakes,	Turkish General Assembly
2010	Report on Earthquakes	Chamber of Geological Engineers
2011	Sub-Group Reports of UDSEP-2023	AFAD
Reports are in Turkish and can be downloaded from http://www.deprem.gov.tr/sarbis/DDK/DDK_WEB.htm		

The scope of UDSEP-2023 is comprised of works to be done in the following areas:

1. Earthquake Information Infrastructure Research,
2. Earthquake Hazard Analysis and Maps
3. Earthquake Mitigation Plans (scenario-risk analysis),
4. Earthquake Safe Settlements and Development,
5. Education and Enhancement of Public Awareness,
6. Protection of the Historic and Cultural Property from Earthquakes,
7. Emergency Management,
8. Legislation Development and Financial Arrangements.

For each area given above special groups were structured and each working group prepared detailed reports. In sum, almost 100 specialists contributed to the final version of UDSEP-2023. Within UDSEP-2023, in accordance with the general scope, risk reduction activities are dominant with some actions devoted for the development of emergency management and post disaster recovery activities. Some of the expected outcomes per se disaster management phases are given in Image 5.

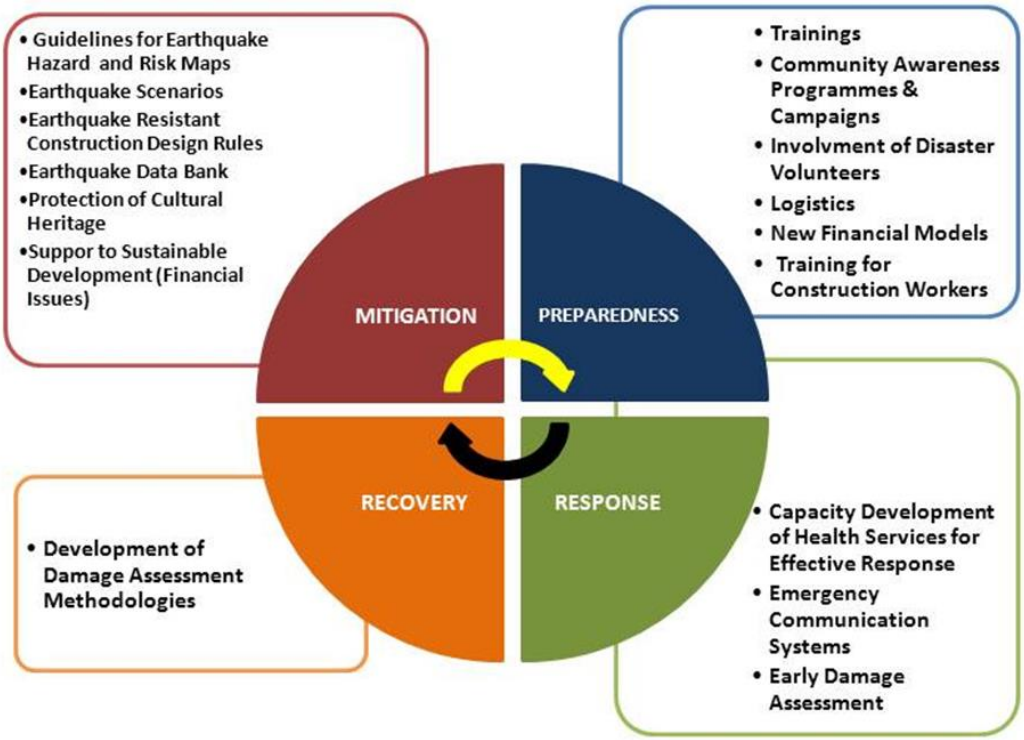

Image 5. Expected outcomes of UDSEP-2023 as per disaster management phases.

As seen in Image 6 first thematic group includes strategies and action mainly related with earth sciences. Better earthquake observations, early warning and early damage assessment studies, seismic hazard mapping, better understanding the physical characteristics of earth interior are amongst the expected outcomes by 2023. With second thematic group, earthquake engineering activities, safe construction, protection of cultural heritage, retrofitting of critical structures, protection of infrastructure and training of workers and

technicians working in construction applications are planned to be achieved. 3rd Thematic Group is mainly related with awareness, training, education activities and resilience of communities. In addition to that primary legislative arrangements are included within this group. Last strategy is devoted to increasing emergency management capacity. The whole document in English and Turkish is available at AFAD Earthquake Department web site (www.deprem.gov.tr).

This plan is consistent with existing policies, plans and will become a part of National level DRR strategy and action plan which is being planned. During the preparation of this documents all actions are designed to be realistic and able to implement and final decisions are given by the possible responsible organizations.

5. Conclusion

DRR is the most important element in order to achieve secure living areas and maintain resilience to disasters.

Earthquake Strategy and Action Plan of Turkey is a national roadmap in order to reduce earthquake related losses by 2023. It includes strategies and actions under three thematic areas. This document was prepared by multi-stakeholder participation and published in official letter by the decision of Ministerial Level Disaster and Emergency High Board. UDSEP-2023 gathered previous efforts in earthquake mitigation to a strategy document. Political commitment to that roadmap was also reached. Just like many roadmap or guiding documents, UDSEP-2023 will also be a living document. There could be no major, but limited changes during the implementation period.

Strategic approaches to DRR measures are important tools for countries in order to manage DRR activities within a given timetable and coordinated way. This methodology gives possibility to funding agencies when prioritizing the funding for specific projects. By using strategic approaches, including time limited actions with clear responsibility of roles also prevents loss of multiple funding of similar studies and motivates responsible organizations to reach expected results within a given schedule.

HFA (2005-2015) has promoted countries to create strategies and plans. Preparation of those plans are important motivations, however implementation of them is the key in order to achieve DRR. HFA2 could be an opportunity to further detail the ways of implementation of national level strategies and plans at all levels.

Image 6. Strategies of UDSEP-2023.

6. References

AFAD, 2012, National Earthquake Strategy and Action Plan. Prime Ministry Disaster and Emergency Management Presidency (www.afad.gov.tr)

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www.deprem.gov.tr, Web site of AFAD Earthquake Department.