

Environmental Emergencies Capacity Assessment in Turkey: workshop results and recommendations



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Office for the
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Ministry of Environment
and Forestry



United Nations
Environment
Programme

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Cover photo: View of Ankara from Ministry of Environment and Forestry building

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1. Introduction

In the context of longstanding collaboration between the Joint UNEP/OCHA Environment Unit (JEU) and Turkey, a request was made in early 2006 to conduct an environmental emergency preparedness mission. The invitation noted that the Ministry of Environment and Forestry and its national partners involved in disaster management (Ministry of Health; Ministry of the Interior, General Directorate for Civil Defence; Ministry of Energy and Natural Resources; the Prime Ministry Undersecretariat of Maritime Affairs and Ministry of Public Works and Settlement, General Directorate for Disaster Affairs) wished to receive a delegation to '*discuss possible areas of cooperation related to environmental emergencies.*' The **Environmental Emergencies Partnership**¹ was also noted as an important backdrop to the invitation. Subsequent discussions with Turkish authorities confirmed the following objectives for this undertaking:

1. To develop, in partnership, a common understanding of Turkey's needs, capacities and synergies related to environmental emergency response preparedness;
2. To discuss possible areas for partnership related to environmental emergencies and develop a shared initial strategy for future collaboration and partnership, and, more generally,
3. To increase awareness of practical prevention/preparedness measures related to environmental emergencies.

It was agreed that the exercise would be broadly based on the pilot National Capacity Assessment Methodology (NCAM)¹ developed by the JEU. This tool assists in the determination of national environmental emergencies capacities and needs at strategic, managerial and operational levels. According to the methodology:

- o The Turkish authorities would assign a focal point to coordinate the preparation of a baseline draft country report.
- o Relevant stakeholders would be jointly identified for participation in a three-day national workshop to be held in Ankara.
- o During the workshop, a) the baseline draft report would be presented by the authors and discussed with the stakeholders in order to arrive at a shared understanding of the situation in Turkey, and b) a simulation exercise would be carried out in order to understand how laws, institutions and procedures are likely to work in a real-life environmental emergency situation.
- o Based on the analysis of the country report and on the results of the simulation exercise, main issue areas would be jointly identified and options for next steps would be agreed.

The draft baseline Country Report was prepared under the coordination of Mr. Mustafa Er of the Ministry of Environment and Forestry during the last two months of 2006, and the national workshop was held 22-24 January, 2007. The workshop involved approximately 30 representatives of all the governmental bodies concerned with disaster management and of research institutions (see Annex 1 for complete list).

2. The Country Report

The information in this section was compiled by Turkish national authorities in the Ministry of Environment and Forestry to provide workshop participants with baseline information, and was presented during the proceedings. Editorial changes have been made to fit the contents into this document.

Country profile

Turkey is located at the border between two continents, Southeastern Europe and Southwestern Asia. Only a small part, the west of the Bosphorus (Istanbul Strait), is geographically located in the continental Europe. Turkey borders the Black Sea to the North, the Aegean Sea to the West and the Mediterranean Sea to the South, and has a coastline of 7200 km. The country occupies a strategic location, since it controls the Turkish straits (Istanbul, Sea of Marmara and Canakkale). Turkey has eight neighbouring countries, Armenia, Azerbaijan, Bulgaria, Georgia, Greece, Iran, Iraq and Syria. Mount Ararat, the legendary landing place of Noah's Ark, is Turkey's highest point at 5166m. The total area of Turkey is 780,580 sq km, of which 29.81% is arable. Anatolia is a high central plateau. At the coast lines a narrow plain while there are also several mountain ranges. Turkey has a variety of natural resources as coal, iron ore, copper, chromium, antimony, mercury, gold, barite, borate, celestite (strontium), emery, feldspar, limestone, marble, perlite, pumice, pyrites (sulfur), clay, arable land and hydropower.

Natural disaster profile

In general, Turkey is subject to earthquakes, floods, landslides, avalanches and forest fires, with earthquakes having by far the greatest impact on population and infrastructure. From the geophysical point of view, most of the country is affected by active fault zones: the North Anatolia fault, roughly corresponding to the southern shore of the Black Sea, and a variety of faults in the western Aegean region and in the southeastern and eastern Anatolia regions.

The following table summarizes the seismic events occurred during the last 25 years.

Date	Place	Magnitude/Size	Death Toll/ Buildings Damaged
27.03.1982	BULANIK	5,2	0/1.000
30.10.1983	HORASAN	6.8 /VIII	1.155/3.241
18.09.1984	BALKAYA	5.9/VII	3/87.
05.05.1986	SURGU	5.8/VII	8/824
06.06.1986	SURGU	5,6	1 /1.174
07.12.1992	AKYAKA	6,9	4/546
13.03.1992	ERZINCAN	6.8 /VIII	653 / 6.702
01.10.1995	DINAR	5.9/VIII	94/4.909

05.12.1995	PULUMUR	5.6/VIII	
14.08.1996	MECITOZU	5.4 / VI	145/707
22.01.1997	HATAY	5.5 / VI	1 /1841
27.06.1998	CEYHAN	5.9/VIII	145/1338
17.08.1999	IZMIT/MARMARA	7.4 /X	17127/50000
12.11.1999	DUZCE	7.3 /X	798 / 20503
06.06.2000	ORTA-CERKES	5.8/VIII	1 /1776
03.02.2002	AFYON/SULTANDAGI	6,0	2500/3000
01.05.2003	BINGOL	6,4	1000/2500
27.01.2003	TUNCELİ PULUMUR	5,8	250/100

A total of 2952 settlements have been affected by earthquake in the last 50 years. The most important event was the earthquake on 17 August 1999. According to official data, more than 17,000 died, more than 43,000 were injured, 114,000 buildings collapsed or were damaged, 600,000 peoples were made homeless and the total population affected was about 16 million. The most important forest fire of the last 25 years broke out near the city of Aydin in September 1985. During the response to this fire, 15 soldiers lost their lives. About 600 hectares of Turkey's most important forest were extensively damaged.

Landslides account for over 25% of Turkey's natural disasters, having affected a total of 4,161 administrative units during the last 25 years. Floods account for over 10% of Turkey's natural disasters, having affected a total of 1,861 administrative units during the last 25 years. In a single episode, about 45 settlement areas were severely affected and more than 100 people died. The most affected city is Erzurum. In total, 209 flood events killed 370 people and caused an estimated USD 95 million in monetary losses. Other disasters include rockfalls (8.2%) and avalanches (1.2%).

Natural disasters vulnerability

The Country Report stresses the interplay between natural factors and human behavior in determining the overall vulnerability to natural disasters. Whilst active fault lines and the vagaries of climate are natural factors, the Report also cites Turkey's rapid population growth, the fact that such growth occurs mostly in the areas which are most at risk for earthquakes, poor land usage and planning leading to deforestation and erosion. Finally, the report notes a lack of respect of the existing and very strict seismic building codes as man-made factors that greatly enhance vulnerability.

Technological accidents

A developing and highly industrialized country, Turkey has a long recent history of primary and secondary (to natural disasters) technological accidents. The Report lists some of the most significant ones:

- o After the August 1999 Marmara earthquake, three tanks burst and an estimated 6,400 MT of acrylonitril contaminated to the sea, soil, ground water and air. Also, a huge refinery fire broke out in Izmit and took many days to manage. Large quantities of toxic gases were released from the combustion of hydrocarbons and the Marmara sea was affected by a sizeable oil spill.
- o During pumping operations involving a large LPG tanker in Izmit on 28 July 2002, a tank caught fire and exploded. This triggered later the explosion of other 9 tanks in the facility. An estimated 300 MT of LPG burned and 2 workers employed in the facility were injured.
- o These were a huge fire involving naphthalene tanks at the ATAS refinery on 25 July 2004 in Mersin. There were no dead or wounded people. The fire lasted for 30 hours.
- o The collision between the Nassia tanker and another vessel and the ensuing fire resulted in the death of 29 officers and crew members of both ships. Approximately 20,000 MT of crude oil - a considerable part of Nassia's cargo - caused severe pollution and a fire which lasted 4 days and consequently suspended traffic in the Strait for several days. 1,578 tonnes of heavy fuel oil was spilled into the Marmara Sea, covering the coast of Marmara with fuel-oil and affecting about 5 square miles of the sea. After Clean up operations for 275 days 1,488 tonnes of oil were collected.
- o During the first Gulf War (1990-91), the Iraq Government discharged oil into to the Mediterranean and the spill reached the southern coasts of Turkey. More recently, the same risk threatened Turkey coasts because of bombing of oil refineries in Lebanon.

Technological vulnerability

The Report discusses the links between high industrial development and prevalent natural hazards. The biggest and most important industrial facilities, refineries, petrochemical plants are situated on the west coast of the Marmara Sea (Izmit Gulf). That region is unfortunately right on top of the North Anatolian fault zone. The big cities of Istanbul and Izmir and many smaller industrial installations are under the similar risk. The Report also refers to a number of "internal" factors (personnel not adequately trained, labor codes not always enforced, old, inadequate or poorly maintained infrastructure, lack of containment procedures), which have a bearing on vulnerability of the industrial installations and of the surrounding population.

A special case is constituted by the ship traffic going through the straits in northwestern Turkey. During the last 70 years, the number of vessels passing through the Straits has increased 11 times while their total tonnage has increased more than 25 times. Indeed, while the number of ships passing through the Straits was 4,500 in 1938, today this figure is today around 50,000. About one fifth of those vessels carry hazardous materials. The daily intense maritime traffic in Istanbul (about 2,500 shuttle boats), inter-city ferries, leisure crafts and fishing boats adds to the problem. More than 2.5 million people are involved every day in Istanbul alone in the maritime traffic for transport and other purposes. Furthermore, weather conditions causing poor visibility due to thick fog, snow and rain and strong changing currents and undercurrents reaching up to 7-8 knots are additional hazards in these narrow waterways.

Disaster response history

Natural and technological disasters have been responded to almost exclusively at the national level. The notable exception is represented by the 1999 Marmara Earthquake, which saw a massive outpour of international solidarity. Urban search and rescue and emergency health assistance were provided alongside huge quantities of relief items. International teams were also involved in the management of the fire at the Izmit refinery.

Floods, landslides and forest fires are ordinarily responded to by national disaster management bodies (General Directorate for Disaster Affairs, General Directorate of Civil Defence, various line ministries and the Turkish Red Crescent). The Army was sometimes involved in relief and/or evacuation procedures. In case of maritime accidents, search and rescue operations were carried out by the Coast Guard and Naval Forces under the coordination Turkey's Main Search and Rescue Coordination Center (MRCC). Shipwreck recovery and marine environment protection operations are normally the responsibility of the Coastal Safety and Salvage Administration.

The first line of response to technological accidents is generally provided by the security and firefighting services of the very affected factories. Only in case of large accidents other responders are involved at the regional level.

The disaster management setup

Alongside the relevant articles of the Constitution, Turkey has a well-developed legal framework for disaster response, which includes:

- Law number 4123 *"Relating to the services should be carried on about the damage and destruction which take place as a result of natural disasters."*
- Law number 7269 *"Relating to the measures taken and the aids made due to disasters"*
- Regulation number 12777 *"Regarding the fundamental principles concerning the Emergency Relief Organization and planning in the disasters"*
- The Decree Law number 180 "the Establishment and Duties of the Ministry of Public Works and Settlement"
- The Regulation number 7/10357 on Measures to be taken for preventing, extinguishing and rescuing in case of fires (excluding forest and building fires).

- o The law no. 5312 established on 11 March 2005 is arrange the responsibilities of the governmental bodies and private sectors for maritime accidents.

A number of other pieces of legislation deal with risk management, including notably with the reduction of risks connected with floods. Concerning environmental aspects, Law no. 4856 regarding the establishment and the duties of Ministry of Environment and Forestry came into force in 2003. With this law, MoEF has been charged with the duties of chemical management and preparation of emergency plans including identification of objectives and policies and economical instruments regarding the management of chemicals for an efficient environmental management.

In 2006, the amendment of the Turkish Environmental Law article 11th requires facilities, municipalities and governorships to prepare emergency plans. The 13th article of this law has also requires facilities with possible environmental risks that may affect third parties to insure for financial responsibility.

Furthermore, according to the Article 13 of Turkish Environmental Law 2872 of 1983 and the Law amendments numbered 3301, protection of the environment is the basis during the production, transport, storage and usage of chemicals which have adverse effects on ecological balance when emitted to air, water and soil. According to the Article 16 of the Environment Law, when the environmental pollution is a threat for the public health the competent authorities (Ministry of Health or on the request of the Ministry of Environment and Forestry), decide the closure of the facilities resulting in those types of pollution temporarily or permanently and asks the highest level of local authority for the implementation of the decision.

In terms of institutions, the legal framework translates into a structure that involves all concerned governmental bodies and is replicated almost identically at the central (Prime Minister) and regional (Governor) levels. At the core of the system, the General Directorate of Disaster Affairs is entrusted with the following responsibilities:

- o Providing emergency aid and securing coordination among the relevant institutions during and after a disaster,
- o Implementing the measures to provide temporary shelter immediately after the disaster and undertaking the reconstruction and rehabilitation activities of damaged housing, work places and infrastructural facilities,
- o Taking measures to implement and coordinate planning, project preparation, implementation, management and control activities in disaster areas as well as in disaster prone areas,

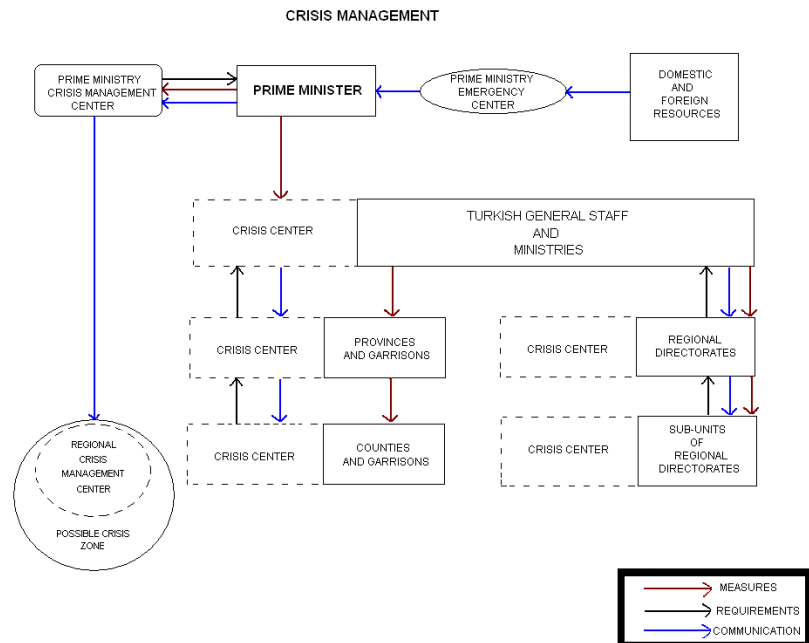


Figure 1. National crisis management set-up (courtesy of Turkish national authorities)

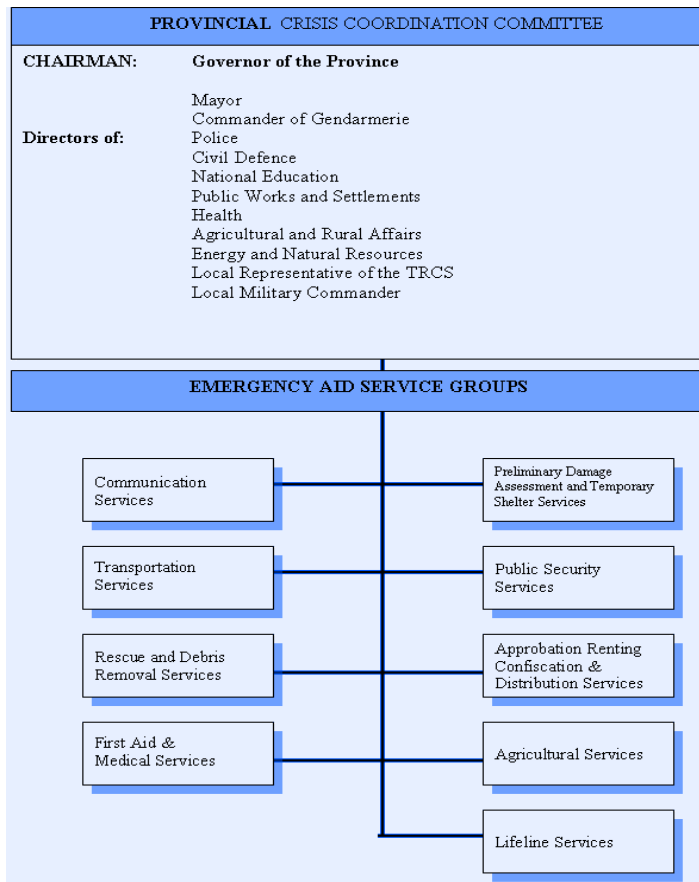


Figure 2 : Provincial coordination coordination structures (courtesy of Turkish National authorities)

- o Determining the potential disaster areas and taking the necessary precautions for preventing disasters and minimizing the loss of life and property,

- o Development of seismological and strong ground motion network for the country, establishment of a national information centre of processing of all kinds of earthquake data, such as the preparation of earthquake catalogues and earthquake hazard maps of Turkey,

- o Establishment of regional centers for the production and storage of prefabricated structural elements aiming at the accommodation of people in cases of disasters.

In addition to the governmental bodies, during emergencies the Turkish Red Crescent (TRC) takes plays a key role in three service areas:

- o Pre-damage assessment and temporary shelter,
- o Purchasing, renting, confiscating and distribution of relief items service group, and;
- o first aid and health.

TRC has the capacity of addressing 250,000 people's needs in times of emergencies so as to serve temporary shelter and nutrition.

With specific regard to environment, the Report notes that the management of environmental emergencies institutionally located in quite some different institution. They are, Ministry of Environment and Forestry, Ministry of Health, Turkish Atomic Energy Authority, General Directorate of Disaster Affairs, General Directorate of Forestry, Ministry of Culture and Tourism.

3. Preparedness for Environmental Emergencies: issue areas

Following the presentation of the Country Report, a desktop simulation exercise was carried out based on a fictional, extensive technological accident that goes "off site," i.e. requires emergency response beyond the capacity of the factory's own personnel. The scenario included an extensive fire, the release of a toxic plume affecting a large populated area and secondary pollution of surface waters.

Through the exercise, participants identified issues that require attention in order to improve efficiency and effectiveness in the management of such emergencies. This section describes these *as identified by participants during the simulation*, divided into emergency preparedness, response and follow-up.

Preparedness

- It appears that factories are required to compile and regularly update a wealth of technical information concerning hazardous materials (consistent with Seveso guidelinesⁱⁱ). However, such information may not be readily available to all first-line responders in case of an accident. For example, firefighters may not have consistent access to the information on a hazardous installation affected by an emergency. Systems and procedures should be in place so that emergency personnel can immediately access such information, for instance through crisis centres.
- Chemists employed by factories dealing with hazardous materials, and the specialists available through the crisis centres, may not have sufficient field experience to provide sound advice during emergencies. They would greatly benefit from field training. At the same time, the entire emergency response system for technological accidents would greatly benefit from regular drills and simulations.
- The role of the Ministry of Environment and Forestry in response to emergencies is far from clear, and was described by some as peripheral. Legally, the Turkish Environmental Law numbered 2872 assigns coordination role to the Ministry of Environment and Forestry in case of environmental emergencies, but there are some difficulties to put this legal structure into practice. In the harmonization process of relevant Turkish Legislation to that of the EU; with the Seveso II directive regarding major industrial accidents, the role of the Ministry will be better defined and clearer. Furthermore, the Ministry did not appear to have a clear vision of where it wants to go in the future. At the operational level, its relationship with other lines ministries and reporting lines to the General Directorate for Disaster Affairs are somewhat blurred. This was the most important issue to emerge from the workshop and will be dealt with in the last section under Recommendations.
- A wealth of capacity and expertise exist with the private sector in Turkey that the national setup for the management of environmental emergencies could take advantage of. Contacts should be pursued, possibly under the auspices of the Turkish office of the United Nations Development Programme, in order to assess such capacities and explore areas of possible collaboration.

Response

- There may exist an over-reliance on the capacity of the personnel of industrial installations to manage large-scale accidents and on the role the army can play in such situations. Experience in many countries of the world shows that

governmental and non-governmental emergency management actors are key in minimizing the adverse consequences of environmental emergencies, especially when the population is involved.

- It appears that no established procedures exist to identify who is in command of the on-site emergency response operations. Whilst it is clear that the overall authority and responsibility lie with the Governor of the affected region, it is not clear to whom this authority is delegated during the response to specific accidents that involve different actors. This is a major problem, as precious time and energy may be wasted in appointing a commander in the heat of the action. At the same time, not having pre-established reporting lines, it may be even more difficult to "place" the Ministry of Environment during the response phase. Such procedures should be agreed upon at the highest level, widely disseminated among the emergency response organizations and tested through simulation exercises.
- It was also not clear whether procedures exist for the activation of crisis centres. Is there a threshold in the severity of the accident that would automatically trigger the activation of such centers? Are staffing levels and reporting lines defined? Does the Ministry of Environment have a specific role? If procedures indeed do not exist, they should also be agreed upon, disseminated and tested.
- Finally, chemists and environmental experts are apparently available through the crisis centres to advise during emergencies. It is not clear, though, to whom these specialists belong administratively. Who employs them, who makes them available, and according to what procedures? This was identified as an area where the Ministry of Environment could play a more active and predictable role.

Follow-up

- Participants felt that clear standards and guidelines describing 'who does what' following an emergency would be useful.
- The response to environmental emergencies and especially emergency follow-up operations such as cleanup, decontamination and rehabilitation often require specialized and costly equipment and technology. Such equipment and technology are not likely to be used very often, and it is generally not advisable for governments to acquire and maintain them. A better alternative is represented by stand-by arrangements between the government and international private companies who specialize in this kind of operations and can make their services available with no delay. Should this alternative be considered in Turkey, procedures should also be established on how to request and receive international assistance.

4. Conclusion and recommendations

The workshop served to develop a baseline assessment of Turkish capacity to respond to environmental emergencies, and allowed this to be shared with a wide range of participants, all of whom contributed their own views to the country report. Moreover, it served to highlight a number of important issue areas that could be considered by the Ministry of Environment and Forestry and its partners in future.

The main, overarching recommendation that emerged from the national workshop is that the Ministry of Environment and Forestry should elaborate clearly its own vision, objectives and structures concerning its role in the management of environmental emergencies. The view of the mission team is that this should be a first step, before tackling any of the more specific issues noted in Section 3, above.

In this undertaking, the Ministry of Environment and Forestry could draw on a wide range of international good practice and guidelines, for example those prepared by the JEU on setting up a national environmental emergency centres.

Whatever the final form and details of its environmental emergencies approach, the Ministry of Environment and Forests should consider the following:

- o The Ministry should have a very clearly defined structure and mandate for environmental emergencies that is known and accepted within the Ministry and the Turkish response community for generally. These should be explicitly sanctioned by senior management.
- o The Ministry should consider being first and foremost a provider or 'broker' of relevant knowledge and service to the existing Turkish response structure. The Ministry should clearly not endeavour to be an operational emergency response entity, but rather provide the right knowledge and tools, to the right people, in the right format, when it is required. That is, they would have ready information that would help responders identify and mitigate the impacts of any emergency with environmental aspects. (This would be consistent with good practice in a range of other Ministries internationally. Moreover, ministry staff indicated an interest in a strengthened role as a provider of information, so there may already be momentum in this direction).
- o To be an effective broker of emergency-related information, the Ministry would need a small number of trained staff who are reachable 24 hours per day, 7 days per week, and who can describe what information the Ministry can and cannot provide by way of information.
- o Clear, tested procedures for the above-noted functions (or those that the Ministry may ultimately choose) should be articulated in an environmental emergency contingency plan. Again, guidelines for the development of such contingency plans are available.

Annex 1: Participants (excluding mission team, focal point and Chair)

Nur GUNESOGLU	BOTAS (Petroleum Pipeline Corporation)
Nesrin OZCAN	D.S.I. (G.D. of State Hydraulics Works), Department of Etude and Planning, Agricultural Engineer
Dilek YAZICI	D.S.I. (G.D. of State Hydraulics Works), Department of Etude and Planning, Environmental Engineer
Ilhami AYDIN	G.D.of Forestry, Head of Division
Selahattin DURMAZ	G.D. of Emergency Management Head of Department
Ilhami AYDIN	G.D.of Forestry, Head of Division
Hamza YILDIZ	Ministry of Health, Refik Saydam Hygiene Center, Chemistry Engineer
Turan GENC	Ministry of Interior, General Directorate of Civil Defence, Head of Division
Berkant ATAAY	Ministry of Interior, General Directorate of Civil Defence, Technician of Search & Rescue Team
Yuksel SOYLERIZ	Ministry of Health
Tuba ATILA	Ministry Of Health
Bulent OKAY	Ministry of Public Works and Settlement, G.D. of Disaster Affairs
Banu BEHRAM	Ministry of Environment and Forestry, G.D. of Environmental Management, Chemistry Engineer
Saliha DEGIRMENCIOGLU	Ministry of Environment and Forestry, G.D. of Environmental Management, Agricultural Engineer
Menekse DONMEZ	Ministry of Environment and Forestry, G.D. of Environmental Management
Huri EYUBOGLU	Ministry of Environment and Forestry, G.D. of Environmental Management
Kemal DAG	Ministry of Environment and Forestry, G.D. of Environmental Management Head of Division
Gokhan SENTURK	Ministry of Environment and Forestry, G.D. of Environmental Management
Yucel NAR	Ministry of Environment and Forestry, G.D. of Environmental Management
Pervin DILEK	Ministry of Environment and Forestry, G.D. of Environmental Impact Assessment and Planning, Engineer
Turan ERKOC	Ministry of Public Works and Settlement, G.D. of Disaster Affairs
Lutfu KILICLAR	Ministry of Health, Refik Saydam Hygiene Center
Baris KOCTURK	Ministry of Agricultural and Rural Affairs, G.D.of Protection and Control
Meral ELVERDI	Ministry of Agricultural and Rural Affairs, G.D.of Protection and Control
Serap DURMAZ	MTA (G.D. of Mineral Research & Exploration)
Izzet ARI	State Planning Organization, G.D. of Social Sectors and Coordination, Assistant Expert

Elif KUCUK	TPAO (Natural Oil & Gas Company Of Turkey) Chief Engineer of Environmental
Dr. Esin UCUNCUOGLU	The Scientific & Technological Research Council of Turkey Research Expert
Aylin SEYIDOGLU	The Scientific & Technological Research Council of Turkey Assistant Expert
Nihan MORALI	The Scientific & Technological Research Council of Turkey Assistant Expert
Ayhan ERHAN	Turkish State Meteorological Service
Yusuf GULAY	Turkish Atomic Energy Authority
Abdurahman BEKERECI	Turkish State Meteorological Service, Department of Research and Information, Meteorologist
Cemalettin DOGMUS	Undersecretariat of Maritime Affairs
Gurhan AKTURK	Undersecretariat of Maritime Affairs
Murat KORCAK	Undersecretariat of Maritime Affairs

End notes

¹ <http://www.humanitarianinfo.org/eep/>

¹¹ NCAM methodology is available at <http://ochaonline.un.org/webpage.asp?Page=647>

¹¹¹ <http://ec.europa.eu/environment/seveso/index.htm>