

**TURKISH MINISTRY OF PUBLIC WORKS AND SETTLEMENT  
GENERAL DIRECTORATE OF DISASTER AFFAIRS**

**NATIONAL REPORT OF TURKEY**

Prepared for the IDNDR Mid-Term Review and  
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Turkish National Committee for  
International Decade for Natural Disaster Reduction

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## **CHAPTER I OVERVIEW AND EXECUTIVE SUMMARY**

The Turkish National Committee for the International Decade for Natural Disaster Reduction was appointed in 1989 after consultations, inter alia, among relevant agencies and bodies. The Committee consisted of seventeen members who then named five Working Groups as follows:

- o Earthquakes
- o Landslides and Rockfalls
- o Floods
- o Fires
- o "Other" Disasters such as Avalanches, Windstorms, Tsunamis and Volcanoes

Each Working Group comprised additional experts in each of these areas, so that the total number of contributing members was around 60. Disaster types endemic to other location in the world are perceived as not being important enough to be accorded separate consideration in Turkey. These include locust infestation, drought, and wildfire.

Much work has been completed since the inception of the Decade in 1990. While the National Plan has served as the general guide in this work, there have been deviations or omissions from the original blueprint. This report summarizes the important achievements to date, covering essentially the first four years.

In retrospect, the Turkish National Plan for IDNDR was an over-reaching plan with a good many items in its bag. Many important components of this list have already been addressed, e.g. the probability based earthquake zones map, updated seismic design code, landslide hazard map, avalanche hazard map, flood prediction and warning study, earthquake prediction collaboration, establishment of the Earthquake Disaster Prevention Research Center, and review of the national disaster management system are direct outcomes of the National Plan.

## **CHAPTER II RISK ASSESSMENT**

### **Country Profile**

The Turkish Republic is located within the rectangular sector bounded approximately by latitudes 36 - 42 degrees North and longitudes 26 - 44 degrees East (Figure 2.1). It comprises an area of 778'000 sq. km, and has a population of 58 million. It lies between the Black Sea and the Mediterranean Sea, bridging Asia and Europe. The European and Asian sides are divided by the İstanbul Boğazı (Bosphorus), the Sea of Marmara, and the Çanakkale Boğazı (Dardanelles). Anatolia is the name given to the larger Asian part which is a plateau rising progressively towards the east, and is broken by the valleys of some 15 rivers, including Sakarya, Kızılırmak, Yeşilirmak, Seyhun, Ceyhun, Fırat and Dicle. There are numerous lakes of which some, like Lake Van, are as large as inland seas. In the north, the eastern Black Sea mountain chain runs parallel to the Black sea; in the south, the Toros mountains sweep down almost to the narrow, fertile coastal plain along the Mediterranean. Turkey enjoys a variety of climates, changing from the temperate climate of the Black Sea region, to the continental climate of the interior, then to the Mediterranean climate of the Aegean and southern coastal regions. The coastline of Turkey's four seas is more than 8'000 km in length.

The country is divided into some 76 units called provinces where governors represent the functions of the government. Each province is further subdivided into districts. The major cities and their populations are: İstanbul (7.4 M), Ankara, the capital (3.2 M), İzmir (2.7 M), Adana (1.9 M), Antalya (1.1 M), and Bursa (1.6 M). The Turkish language belongs to the Ural-Altaic group, and has an affinity to the Finno-Hungarian languages. Modern Turkish is written with Roman characters. It is spoken by some 150 million people worldwide.

Turkey has a rapidly expanding economy in which tourism, agriculture, natural resources and industry are the principal components. Its exports (with industrial products comprising three-quarters) total some \$18 billion, and imports, including oil, total \$28 billion.

The Turkish Republic is a parliamentary democracy. Turkey is a founding member of the Organization for Economic Cooperation and Development (OECD), a member of NATO and the Council of Europe, and an associate member of European Economic Commission (EEC) and the European Free Trade Association (EFTA).

### **Hazard and Vulnerability Assessment**

The country's geology, topography and climate generate the kinds of natural disasters which form the justification of IDNDR. These natural disasters have caused widespread destruction and loss of life in the past. For example, Table 2.1 lists the percentage of dwelling units destroyed by natural disasters during the last 55 years. The data in this table indicates that of all types of natural disasters earthquakes represent the greatest hazard, causing about two-thirds of home destruction and an even higher share of fatalities and financial losses. In the period since 1960 the impact of floods, fires and rockfalls have abated, but landslides and avalanches have shown an increasing tendency. We anticipate that

in the future the major threat to human settlements will be posed by earthquakes, with landslides and avalanches occupying the next rank.

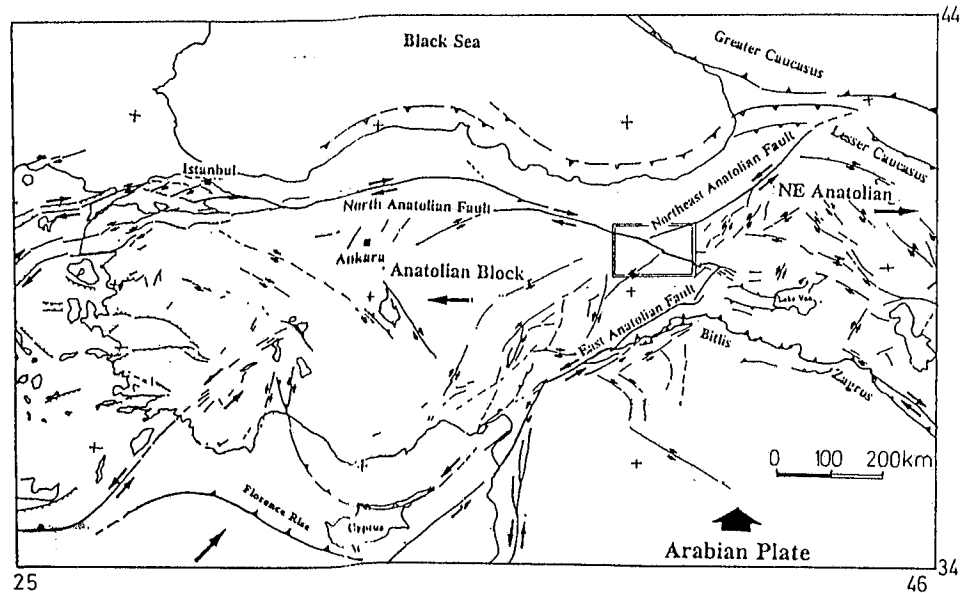


Figure 2.1. Geographical Location

In Turkey the Ministry of Public Works and Settlement is empowered, through Law No. 7269 enacted in 1958, to serve the public in its need for protection against all types of natural disasters, and to implement comprehensive preventive and protective measures for this purpose. The Ministry fulfils this mandate through its General Directorate of Disaster Affairs, which is similar to the Federal Emergency Management Agency in the USA.

Table 2.1 Statistics of Dwelling Units Destroyed by Natural Disasters

Natural Disaster Type	Percent of Total
Earthquake	61
Flood	14
Landslide	15
Rockfall	5
Fire	4
Avalanche, storm, rain	1

The most prevalent form of geological hazard in Turkey are earthquakes. The first time any form of seismic zonation was attempted in Turkey was in the aftermath of the magnitude-7.9 earthquake in the city of Erzincan in 1939. This event caused much loss of life and property, and was followed by other great earthquakes during a four-year long migration of epicenters associated with the central and eastern sections of the North Anatolian Fault. Mitigative measures were enacted in 1944 to prevent further losses. These

measures took the form of a law which enabled the government to enforce preparatory measures for buildings in what was then called "disaster areas". For this purpose, a seismic building design code and a seismic zones map, shown in Figure 2.2, were issued. Both documents have undergone revisions since that time. Currently, the 1972 version for the map (shown in Figure 2.3) and the 1975 version of the code are in effect.

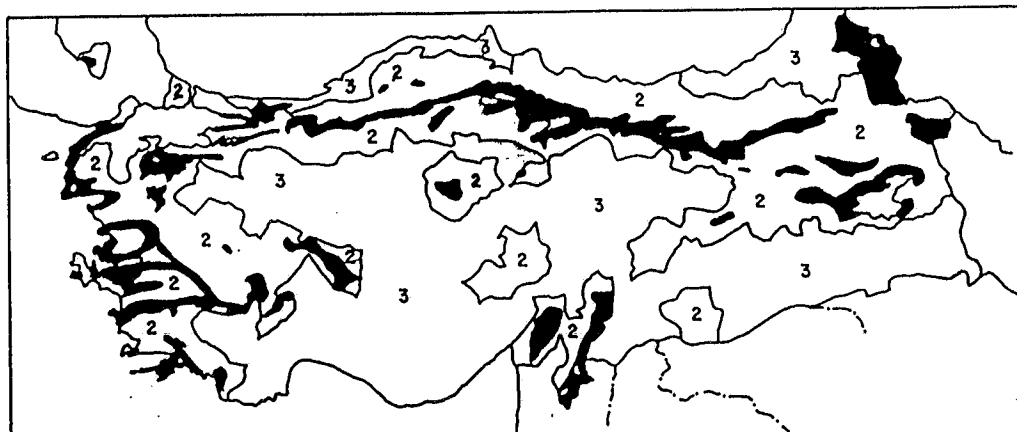


Figure 2.2 1945 Seismic Zones Map

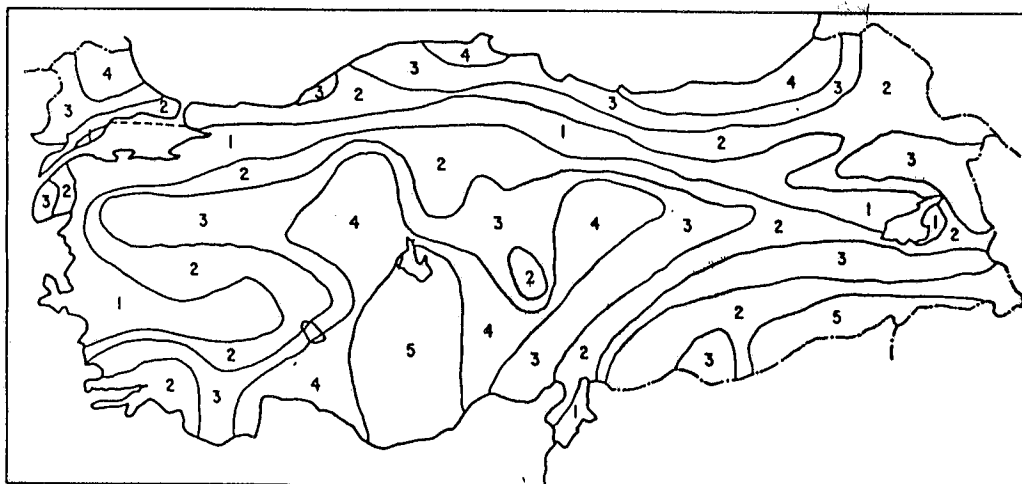


Figure 2.3 Current Seismic Zones Map

In the definition of the bounds of the seismic zones in Figure 2.3, the criterion which was accepted was the observed maximum intensity. In Table 2.2 we list the seismic zones and the elements at risk which they contain.

Table 2.2 Elements at Risk in Turkey

Earthquake Zone	Population %	Landmass %	Major Industry %	Dams %
Zone I (MMI $\geq$ IX)	22	14.8	24.7	10.4
Zone II (MMI $\geq$ VIII)	29	28.4	48.8	20.8
Zone III (MMI $\geq$ VII)	24	28.8	12.0	33.3
Zone IV (MMI $\geq$ VI)	20	19.4	12.6	27.1
Zone V (MMI $\leq$ V)	5	8.6	1.7	8.4

Landslides are the next worst form of geological hazard. Twelve provinces with a landmass of 9'300 sq. km and a total of some 11 million inhabitants in the Black Sea and Marmara regions are the most vulnerable areas. The causes of landslides are usually identified as deforestation, overpopulation, and excessive rains. Statistics compiled by the General Directorate of Disaster Affairs reveal that during the last 32 years 3885 settlements have been subjected to landslides, and some 75 thousand dwellings units have been relocated.

There existed no landslide hazard maps prior to IDNDR. Since April 1992, a subcommittee of the National Committee has started the work which will culminate in such a map. This task group contains members from a number of universities and other government agencies. The draft 1:1'000'000-scale map which this group has initiated has pinpointed landmovement studies performed by the contributing agencies, and has an associated database with information taken from survey forms as well as rainfall statistics. The initial indications of this mapping activity are that terrain with more than 5 percent slope, and 600 mm annual rainfall, north faces of inclined areas, and settlements within the North Anatolian or East Anatolian fault zones are most likely to be affected by this natural hazard.

Rockfalls appear most frequently in the Mediterranean, inner and Eastern Anatolian regions. In the period between 1960-1992 1297 settlements were affected by this form of natural disaster, and 30 thousand dwelling units were relocated.

Other forms of **geological hazards** such as volcanic eruptions, and tsunamis are not frequent enough in Turkey to deserve particular attention. It is estimated that about 500'000 people live in well-definable areas with potential volcanic activity, but risk studies,

preventive emergency plans or public awareness exercises have not been implemented. This apparent neglect can be traced to the fact that to date no material or life losses have resulted from volcanic eruptions. Similar qualifications apply to tsunamis.

Floods are the most widely distributed form of **meteorological** hazard in Turkey. The Task Group of the National IDNDR Committee dealing with floods has cooperated with the General Directorate of State Waterworks, the General Directorate of State Electrical Surveys, and the General Directorate of Meteorology to produce two very important background documents for flood hazard assessment. The first is the "Atlas of Maximum Precipitation Frequencies in Turkey", and the second the "Atlas of Maximum Riverflow Frequencies in Turkey". Within the same framework, a critical safety review of maximum spillway overflow of dams in operation has been made. A further compilation has been for the maximum floods in the country.

There has been an increasing frequency of avalanches in recent years. Whether this indicates a long-term tendency has not yet been fully assessed as yet. The first task attempted within the National Committee has been towards the preparation of an avalanche map for the country based on recorded observations, and a 1:1'000'000-scale draft has been produced. Within the same context a comprehensive literature survey on avalanche formation, dynamics of avalanches, and related topics has been performed.

## CHAPTER III MITIGATION ACTIVITIES

### Status of Nationwide Mitigation Strategies

As in many other similar contexts, the few months or even years following a major natural disaster witness a strong interest for hazard mitigation in the public opinion, which the political structure must consider. Such activities are given during this sensitive period political and financial priority, but these become blurred and less important as memories begin to fade, other priorities emerge, and fatalistic and even apathetic attitudes begin to prevail. This explanation is a plausible, though not necessarily acceptable fact for a country such as Turkey with a dynamic and young population on the development path.

The necessary technical manpower required for natural hazard mitigation exists today in Turkey, both in educational institutions and in the civil service. The same does not hold at local administration level where land use decisions are made, and where comprehensive scientific mitigative measures need to be implemented. An immediate and persistent problem is in supervision of building construction. Many recent disasters have shown that lack of quality control in building construction led to excessive material losses. There is an urgent need for ground breaking legislation in this regard. Societal attitudes nourished by the paternalistic attitude of governments in post-disaster periods to compensate for all losses only serve to exacerbate this situation. Currently the Sixth Five-Year Plan is in effect, and like most of its predecessors this one also foresees the replacement and rehabilitation of all inadequate forms of construction, and the establishment of an effective building supervision organization at urban centers to be operated by local governments. As seen in Table 2.2, active earthquake zones cover 43 percent of the land area of Turkey where the estimated number of substandard construction is 1.3 million units. The physical countermeasures stipulated in the Plan would be prohibitively expensive to put into effect.

At the political level it is perceived that Turkey must maintain an annual economic growth rate of 7 percent at least until the year 2005 because of its high population growth rate-currently 2.1 percent per year. Projections indicate that by the year 2015, population growth rate will decrease to about 1.3 percent, and the population will stabilize around 84 million. No destructive earthquakes or other natural disasters have hit the rapidly developing cities in the Marmara and Aegean regions during recent decades, but the averaged economic losses have still equalled about 1 percent of the country's GNP over the last 60 years. Assuming that natural disaster mitigation expenditures remain at the current low rates, the annual direct losses may reach 1.5-2 percent of the GNP in the post-2000 period. If, in accordance with pessimistic scenarios, major earthquakes were to happen within heavily industrialized belts, then this figure may well reach 7 percent of the GNP.

The current status of natural disaster mitigation and preparedness in Turkey is shaped by Law No. 7269-1051 whose title reads "Measures and Assistance to Be Put into Effect Regarding Natural Disasters Affecting the Life of the General Public"(referred henceforth as the Disasters Law). As the title implies this law mandates measures for all types of natural disasters which uproot enough citizens from their everyday lives as to be qualified as "general". A basic feature of this law is that it makes resettlement of affected populations the responsibility of the state, and determines that the basic policy and coordination at times of disasters be spelled out by the Ministry of Public Works and Settlement. Another feature of the law is that it established a "Natural Disasters Fund", a pool of money to be spent quickly



during emergencies. A number of statutes and regulations have also been enacted to facilitate the implementation of the Disasters Law. Article 4 of the Law and a regulation called "Emergency Aid Organization and Programs Related to Natural Disasters" contains detailed guidelines on how governorates and ministries will plan and organize emergency activities. The same article also requires that each province shall prepare a "Provincial Rescue and Relief Plan" and provide training and exercise to ensure that it is properly administered during a natural disaster.

Provincial governors are given extraordinary powers in case of natural disasters. For these powers to be exercised, however, the Council of Ministers must declare the affected area as a disaster area. The Provincial Rescue and Relief Committee is composed of senior provincial officials from relevant ministries and departments, and includes the mayor of the affected city who is of course an elected person. In spite of its local character, the disaster management system in Turkey is in fact highly centralized. The governor is an official appointed by the Ministry of the Interior, and has limited operational role because funding comes directly from the central government. The General Directorate of Disaster Affairs has taken on the role of establishing disaster policies, and revising them continuously in the light of experience. Given that major disasters in Turkey result from damage to buildings and infrastructure caused by earthquakes, the Ministry has been traditionally the most heavily involved.

## **Current Issues**

The IDNDR has provided a good opportunity for a critical review and assessment of the strengths and weaknesses of the disaster management and mitigation structure in Turkey. The following is a summary of this assessment:

**Broad Base.** The current law has a broad base in that it addresses all kinds of natural disasters. Principles and criteria for allocating state funds to affected citizens have been clearly spelled out.

**Financial Measures.** The disasters fund mentioned earlier is a convenient tool for shedding the constraints associated with national budget resources. Its revenues need to be expanded and brought to realistic levels.

**Continuous Revision of Legislation.** Turkey has numerous laws and regulations concerning prior planning and actions in the response, recovery, reconstruction, mitigation and preparedness phases of national, regional and local disaster management. These documents are continuously revised and assessed as their deficiencies become apparent, or as conditions change. For example, the earthquake zones map shown in Figure 2.3 has reached its final stage for the next updating in the form of a probabilistic hazard map drawn in view of the most recent information and knowledge. The proposed map is shown in Figure 3.1. The building design code covering requirements for all natural disasters has also covered much ground, and is expected to become finalized in early 1994.

**Political Stability.** The disaster management system is relatively immune to upheavals caused by political changes because the provincial governors are not political figures, and they as well as other members of provincial committees are not subject to mass reappointments following a change in government.

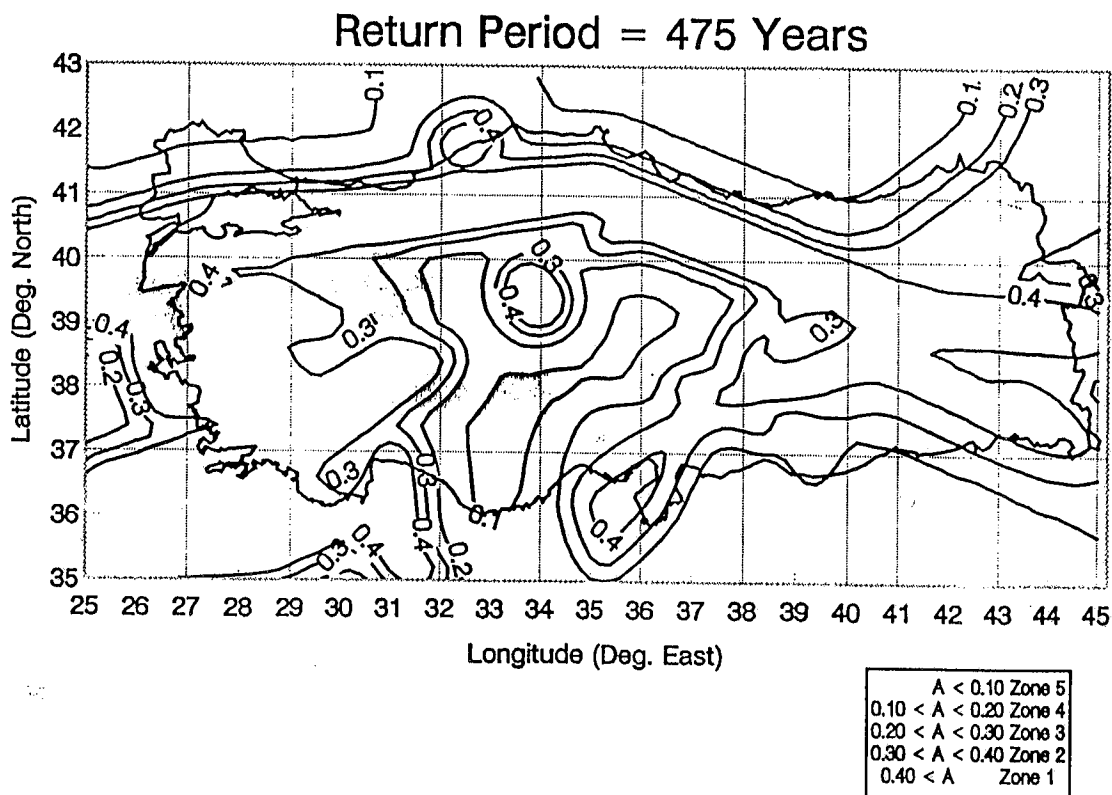


Figure 3.1 Proposed Seismic Zones Map

**Training of Government Officials.** The General Directorate of Disaster Affairs organizes continuing education courses for officials involved in disaster management at all levels of government. Topics covered have included preparedness, building vulnerability assessment, code enforcement, emergency rescue methods, and land use policies.

The self evaluation process has also indicated the following deficiencies:

**Hierarchical.** The hierarchical nature of the disaster management system in Turkey tends to discourage local initiative, and underplays the role of local authorities.

**Linkages between Central and Provincial Government.** Experience to date has shown that adequate coordination between central authorities and local administrators during the critical period immediately following a natural disaster.

**Local Officials.** A common problem is that provincial officials engaged in disaster management are usually not from the province, and may be unfamiliar with the local situation. The turnover of officials may make local plans obsolete, and there may be delays in their revisions.

**Financial Limitations.** The 1975 version of the natural disaster resistant building design code requires, as does its predecessors, that such important structures as hospitals, institutional buildings, law enforcement facilities, etc. should be assessed, and those found to be inadequate should be strengthened. A succession of five year plans have also carried

stipulations that rural housing in disaster prone areas be upgraded. Neither of these has been implemented because of the tremendous costs involved.

**Land Use.** A major deficiency which needs to be addressed is the lack of national microzonation maps for a better evaluation of the natural hazard on a local scale. We have indicated above that steps in this direction have already been taken in that landslide occurrences, avalanche potentials and flooding statistics have been compiled within national IDNDR activities. Earthquake microzonation maps are not in a comparable status. Local administrators have sometimes tended to overlook the natural disaster component when making land use decisions within their jurisdictions.

**Construction.** Another major deficiency relates to the supervision of building construction, and the legal responsibility for substandard building practices. A related issue is the mandatory disaster insurance scheme. These require considerable political determination to resolve. An important aspect is that most rural housing outside municipal jurisdictional boundaries is not supervised by third parties.

**Paternalism.** The disaster management system in Turkey which requires the integrated cooperation of a large number of ministries does not contain instruments which would force the active participation of communities at risk. It is highly paternalistic, and gives assurances that the government will eventually replace all lost property, rebuild every shop or business, and rehabilitate affected economic investments through low interest loans, debt annulments and free credits. The impression on affected communities is that should a disaster occur, the government will immediately step in and take care of their needs, and rehabilitate their environment. This tends to create a spectator attitude on the part of the communities at risk.

### **Changes to the Disaster Management Model**

Through the efforts of the National IDNDR Committee possible changes and ways of improving the natural disaster management model in the country have been identified. These may be summarized as follows:

- o An effective way of enforcing building code requirements must be developed. Municipalities in most cities are not capable of ensuring the built elements at risk can withstand the effects of major disasters, notably earthquakes. The means for this are mostly legal in character.
- o The General Directorate of Civil Defense must be reinforced to have an adequate number of well trained and equipped units ready to intervene.
- o Provincial rescue and relief teams must be trained continuously, and given responsibilities beyond the boundaries of their own areas in case they need to be dispatched to neighbouring provinces. These teams must have state-of-art equipment for rescue trapped of persons.
- o Natural disaster mitigation policies must be made a part of local and national level plans.

- o Financial losses accruing from natural disasters must be distributed to a broader and more equitable base through mechanisms of insurance and similar instruments.
- o A comprehensive and unified effort must be launched towards identifying the nature and severity of natural disasters.

### **Emergency Preparedness Study**

The recent earthquake in Erzincan and an urban disaster in İstanbul illustrated the need for greater readiness in emergency situations. Emergency plans share a number of common features in Turkey. They identify hazards that are likely to threaten the community, potential situations that would place life and property at risk, and describe geographic areas and populations that would be vulnerable to such events. Plans typically discuss risk analysis, the probability of occurrence, and its likely severity. Designers of emergency systems now believe that it is best to prepare responders to deal with all possible situations.

Law No. 7269-1051 stipulates that each province prepare its disaster management plans for different scenarios, and submit them to the Ministry of Public Works and Settlement. In reality these plans are often based on deficient scenarios. They are updated with delays, and are poorly structured to cope with changing conditions and the growth of cities. The study referred to here was undertaken to evaluate the state of emergency planning within the major metropolitan areas and public and private agencies that intervene in post-disaster situations.

Under all-hazards emergency plans, activities are spelled out regarding work in the following areas: communications, hazard warning, public information, evacuation, emergency shelter, fire, search and rescue, and law enforcement. These contingencies must be covered for all types of emergencies. The study will examine existing emergency response organizations and preparedness plans to determine the degree to which they create a system that is activated on the event of any emergency. Among the techniques used in the analysis are the study of official documents and international agency publications, interviews with government and private sector staff, and the development of a library of emergency plans. Under coordination of university experts local researchers will review the above criteria for evaluating the existing system. The research should identify whether or not unique needs exist with reference to natural or man-made hazards. They should ascertain whether a comprehensive framework exists that allows agencies and jurisdictions to address those unique needs. A series of separate, stand-alone, hazard-specific plans and agencies may result in gaps and overlaps. One of the areas of concentration for the implementing agency will be the national civil defense system.

### **Training**

Local police force, fire brigade and civil defense staff, plus Red Crescent staff and other non-governmental organizations need to be trained to enable them to carry out the necessary tasks within a range of natural and technological disasters. Within the scope of this project, local staff of organizations that intervene in emergencies will be trained for the demands identified within this component. Training in search and rescue, particularly for injured people under ruins and first aid will be taught. One training focus will be coordination because when scarce human resources have developed cooperative mechanisms

at the local levels can emergencies be dealt with expeditiously. The training will be given by the experienced staff members of the General Directorate of Civil Defense (GDCD) of the Ministry of the Interior who work in the central or the local units. The facilities of the Civil Defense College and the Ankara Civil Defense Unit will be used.

It should be pointed out that the GDCD will be setting up "Emergency Aid and Rescue" teams within its provincial directorates. These teams, to be constituted at the provincial levels covered by the protocol will be trained by national and peripheral organizations of the said directorate.

### **Other Components**

The seismic hazard map in Figure 3.1 is expected to constitute the basis of the next revised earthquake zones map of Turkey. The Decade has provided the push forward to enable the Earthquake Resistant Building Design Code of Turkey, of which the map is an integral part. Both of these documents are currently in the process of finalization, and we expect that this process will be finalized in 1994. The Earthquake Research Division of GDDA has contracted for the purchase of 20 digital accelerometers. By the end of the Decade it is planned that the total number of instruments will have reached 250.

## **CHAPTER IV PREDICTION AND WARNING**

### **Hydrological Hazards**

A number of activities related to monitoring, predicting and early warning systems had been envisaged. Among these were:

- o Revision of hydrological observations and stations
- o Establishment of hydro-meteorological data banks
- o Installation of telemetering and radar capabilities in selected watersheds
- o Installation of public flood warning systems

As part of the last item a project entitled "Flood Prediction Control and Warning System for the Seyhan River Basin" has been instituted, and is currently being run by a Japanese consulting engineering firm and the General Directorate of State Waterworks. A parallel project is managed by the General Directorate of Meteorology. This project foresees the building of a meteorological radar system in Turkey, and to couple it with a communications satellite due to be launched in 1994.

### **Geological Hazards**

No earthquake warning mechanism exists in Turkey. In keeping with worldwide developments in this area, a coherent project for earthquake prediction was launched in 1980. This project has undergone several organizational modifications, and since 1984 this work has been continued thanks to the active cooperation established with a number of German institutions. The multidisciplinary project concentrates on the western end of the North Anatolian Fault Zone (NAFZ). It is a direct consequence of the joint efforts towards a European program on Earthquake Prediction Research. It is concentrated about 150 km east of İstanbul, where the NAFZ branches into two parts. This geometrical singularity is considered to be responsible for:

- o a change in the fault mechanism from west to east
- o characteristic quaternary vertical movements
- o focusing of earthquake activity
- o extremely short (15 years) reoccurrence period of intermediate to strong events

Starting from the Western edge of the above mentioned area, Kandilli Observatory and the Earthquake Engineering Research Institute of the University of Bosphorus, in cooperation with the Tokyo Institute of Technology, carry out research activities with similar aims.

Thus, it may indicate a zone of difficult slip with stresses being built up faster than in other areas of NAFZ. The project involves about 20 institutions from a broad spectrum of disciplines. We will make further references to this in the chapter on International Cooperation.

## CHAPTER V INTERNATIONAL COOPERATION

### **Status**

A number of international cooperative projects have been undertaken with the impetus provided by IDNDR. While not all explicitly carry the IDNDR name, the justification can certainly be traced to the Decade.

A reference has already been made to the cooperative project "Flood Prediction Control and Warning System for the Seyhan River Basin" which is truly a pilot study in flood prediction using state-of-the-art techniques. A similar study is currently underway in the avalanche disaster. A three-way cooperative project involving the Swiss Federal Institute for Snow and Avalanche Research in Davos, the French "Recherche Agriculture Division Nivologie" and the General Directorate of Disaster Affairs (GDDA) has been successfully negotiated. Funding for this project will be obtained both from the participating parties as well as the UNDP. A separate cooperative effort is underway in the area of training with the Austrian Avalanche Research Institute.

The most ambitious and comprehensive disaster reduction joint project involves Japanese International Cooperation Agency (JICA) which signed a multi-year agreement with GDDA for the establishment of a Earthquake Disaster Prevention Research Center in Turkey. The principal aims of this agreement are quoted from the project document as follows.

"In Turkey there are many poorly constructed rural dwellings which are located in seismically active zones and susceptible to extensive damage during earthquakes. In consideration of this the Japanese Technical Cooperation will aim to achieve the following:

To assist in the experimental construction and operation of an Earthquake Strong Motion Observation Network with several local stations and one regional station in Erzurum in eastern Turkey, with one center in Ankara for data processing, and in training the counterpart personnel in network operation and data analysis techniques. Through such technical cooperation, essential knowledge and technology for the rapid assessment of earthquake characteristics, probable damage features and upgrading emergency responses immediately following earthquakes will be accumulated in order to reduce the seriousness of damage and casualties.

To assist in setting up a displacement controlled actuator system, and training the counterpart personnel in experimental techniques. Through this collaboration the seismic behaviour of brick masonry and poorly reinforced concrete housing will be studied, and repair and strengthening technology will be developed through analytical and experimental procedures."

The project master plan stipulates that the Earthquake Disaster Prevention Research Center will comprise an Earthquake Data collection and Vulnerability Evaluation Subcenter, and a Training and Education Subcenter to be housed within the Earthquake Research Division of GDDA in Ankara, and an Earthquake Engineering Research Subcenter at the Faculty of Civil Engineering at İstanbul Technical University.

## **CHAPTER VI**

### **OVERALL EVALUATION AND FUTURE PROGRAMME OF IDNDR ACTIVITIES**

#### **Goals and Achievements**

In retrospect, the Turkish National Plan for IDNDR was an over-reaching plan with a good many items in its bag. Many important components of this list have already been addressed, e.g. the probability based earthquake zones map, updated seismic design code, landslide hazard map, avalanche hazard map, flood prediction and warning study, earthquake prediction collaboration, establishment of the Earthquake Disaster Prevention Research Center, and review of the national disaster management system are direct outcomes of the National Plan. There have been deviations from the intended plan as well as inevitable omissions, but we believe that Turkey has followed the founding principles and the guiding developments of the Decade to the fullest, and has achieved considerable success in this effort.

#### **Expectations for the Second Half of the Decade**

Turkey is firmly determined to pursue the objectives it has outlined in its National Plan just as vigorously during the second half of the decade as it has during the past four-and-a-half years. International collaboration, and systematic national reviews will be the mechanism to achieve this goal.



## ACKNOWLEDGMENTS

Many individuals have contributed to this report in their capacity as members of the various Working Groups in the National IDNDR Committee. Central coordination for the report was provided by the Earthquake Research Division of the General Directorate of Disaster Affairs where the cooperative spirit represented by Mr. S. Gencođlu, Division Head, and Mr. R. Yılmaz, Assistant Head, must be cited. Final editing and composition of the report was done by Mr. P. Gülkan, Department of Civil Engineering, Middle East Technical University.



# MINISTRY OF PUBLIC WORKS AND SETTLEMENT

General Directorate of Disaster Affairs  
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FAX MESSAGE

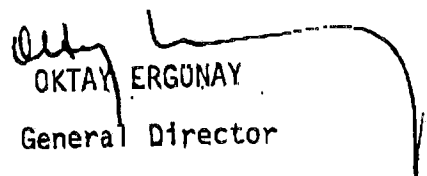
Date : Jan. 18, 1994	Subject : IDNDR Report
From : Oktay Ergünay	Fax No : 90 (4) 287 89 24
To : Dr. Olavi Elo	Des.F.No : 41-227338695
Notes :	
Total pages including this cover : One	

Dr. Olavi Elo  
Director  
IDNDR Secretariat

Dear Dr. Elo

I am forwarding again with Rapid Postal Service, a slightly revised version of the Turkish National IDNDR Report, which had been forwarded in December 1993.

Extending my best regards with the hope that it will reach you very soon

  
OKTAY ERGUNAY  
General Director

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