Welcome to Armenia!

Bari Galust Hayastan!

Dobro Pogalovatj, Armenia!

Disaster Management System in Armenia

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Survey for Seismic Protection
Under the Government of the
Republic of Armenia

General Information About Armenia!

Introduction-1

- Geographical situation:

Location: North-east of the Armenian Upland between the Caucasus and Asia Minor(Southwestern Asia).

Geographical coordinates: 40 00 Northern latitude and 45 00 Eastern longitude.

Area: 29800 sq.km.

Population: 3336100 million

Mountains:

Highest mountain is Aragats – 4095m.

High mountains: Agdagakh-more than 3800 m.

Kapydgykh-more than 3900m.

- Water basin and climate:

Water area: 1400 sq.km.

Largest river: Araks.

Another rivers:the Arpa, the Vorotan, the Razdan.

Lakes: Sevana Lich.

Area:1240 sq.m.

Depth: 83 meters.

There is a cascade of hydroelectric station on the river Razdan;

tunnel with length in48.6kms from river Arpa to lake Sevan.

Climate is dry and high continental- four seasons are exactly defined.

Introduction-2

- Culture:

First theatre in Armenia was found more than 2000 years ago

Religion: Armenian Orthodox-94%(the first country in the world to adopt Christianity as a State Religion)

Languages:state- Armenian, one of the Indo-European linguistic family, Russian and others

Population: Armenians-96.5%, and 3.5%-Russians, Ukrains, Ezidi-Kurds and others

Literacy: 99% of total popu-lation

- Government:

Type - Republic

Administration division:

10 provinces (marzer) and 1 city (Yerevan is capital)

First Independence: 28 of May in 1918

National Holiday: Indepen-dence Day ,21 of September in 1991(from Soviet Union)

Constitution:adopted by nationwide referendum on 5 July 1995

Legal system: civil law system

Main legislative body: Armenian National Parliament (131 members)

Introduction-3

- Industry:

Electric motors,
Machines,
Tires,
Silk fabrics,
Microelectronics,
Jewelry,
Hosiery,
Software development,
brandy

Natural resourses:

Small deposits of gold, copper,molybdenum, zinc,alumina

Introduction-4

- Armenian import commodities:

Natural gas

Petrolium

Tobacco products

Foodstuffs

- Armenian export commodities:

Diamonds

Machinery

Cognac

Mineral water

Beer

Export partners: Russia-17%, US-11%, Belgium-11%, Iran-10%, Ukrain, Turkey

Agricultural products:

Fruit (grapes)

Vegetables

Livestock

Main plants:

Metsamor Nuclear Power plant;

Nairit factory,Cognac factory,

Cable-line factory in Yerevan

Three warm-electric power stations in Yerevan, Hrazdan and Vanadzor cities and fourteen hydro-electric power stations

Currency: Dram

Currency code: AMD

Natural Disasters,disaster Management and Countermeasures

Disasters: The territory of Armenia is located in high seismic activity zone (Alpine-Himalayan active belt).

In general disasters are divided into natural and man-made ones.

Main hazards of disasters for Armenia.

Natural disasters:

Earthquakes-94%.

Mudslides-3.15%.

Landslides-1.2%.

Floods-0.15%.

Man-made disasters:

Transport accidents-1.5%.

Irradiation-0%.

Latest Disasters in Armenia

- During the last centures the following strong earthquakes occurred on the territory of Armenia:
- Earthquake in Vaick, in 735 (M=6.5).
- Earthquake in Vayots-Dzor, in 906 (M=6.5).
- Earthquake in Garni, in 1679 (M=7.0).
- Earthquake in Spitack in 1988 (M=7.1).

Latest Disasters in Armenia

One of the most destructive earhquakes occurred in Armenia is the tragic earthquake on 7th of December in 1988 with epicenter in Spitack city (Northern part of Armenia).

The earthquake covered 40% of the territory of Armenia:

25000 people were died,

19000 became invalids,

More than 530000 became homeless.

Spitack earthquake caused great loss to economy,industry, as well as human resourses and other infrastructures.

Istablishment of Armenian NSSP

- After the Spitack earthquake the task of protection of population of Armenia became an integral part of the National safety of country.

Requirements for decision the task were following:

- Prompt response to disaster.
- Reduction the consequences of disaster.
- Working out the Disaster Management System for Armenia.
- Setting up the Institution responsble for Seismic Risk reduction in Armenia.
- Cooperation between all disaster related organizations.

The Main Features of Armenian NSSP

The National Survey for Seismic Protection under the Government of the Republic of Armenia was founded on 17th of July in 1991 to implement state policy in field of seismic risk reduction.

- International framework program of NSSP on the basis of International projects.
- Creation of the modern technical basis adopted to Armenian conditions.
- Subordination to Armenian NSSP of all observation sites on the territory of Armenia, united in one National Network, consisting of the 150 stations on 3 levels:

a) global international networks (IRIS,GPS, READINESS).

The Main Features of Armenian NSSP

b) regional network on monitoring of densely populated areas and Yerevan city.

c) stations on monitoring of crucial objects (Nuclear power plant, chemical plants, dams, reservoirs and other).

24-hour collection, evaluation and analysis of data.

Using all kinds of connection (from satellite to telephones).

Large National Data Bank and National Earthquake catalogue including all the seismological,geological and geophysical information.

Strategies and Basic Goal of Armenian NSSP

Armenian NSSP was given special governmental status and ministerial powers

The President of NSSP is directly subordinated to the Prime-Minister

The basic goal of Armenian NSSP is the Seismic Risk Reduction in Armenia

Armenian NSSP has developed two Strategic National Programs:

-"Seismic risk reduction inArmenia"

-"Seismic risk reduction in Yerevan city"

The Programs,adopted by the Government of the Republic of Armenia on the 10th and 7th of July in 1999 are designed for 30 years

Main Functions of Armenian NSSP

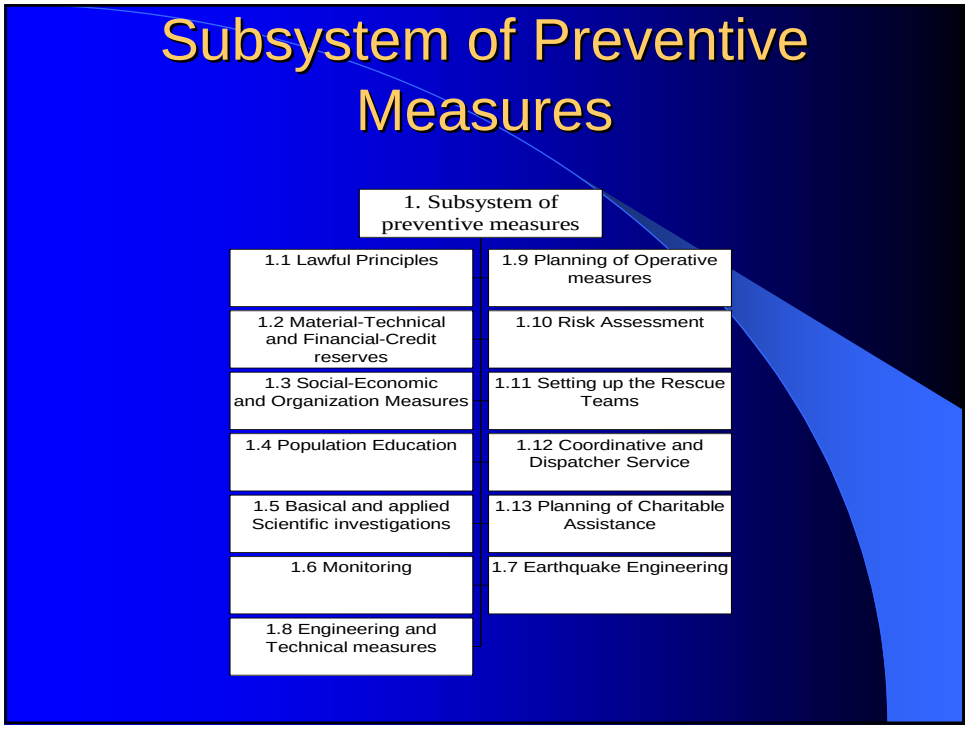
- **Seismic hazard and risk assessment,**
- **Vulnerability reduction in urban areas,including reinforcement and upgrading of existing buildings and structures,design of new codes and standards,**
- **Public awareness,people education and training,**
- **Early warning and notification,**
- **Partnership establishnent, involving public and private organizations,**
- **Risk Management, including Emergency Response and Rescue Operations,**
- **Disaster relief and people rehabilitation,**
- **Insurance,**
- **State disaster law and regulations**

Seismic Risk Reduction System

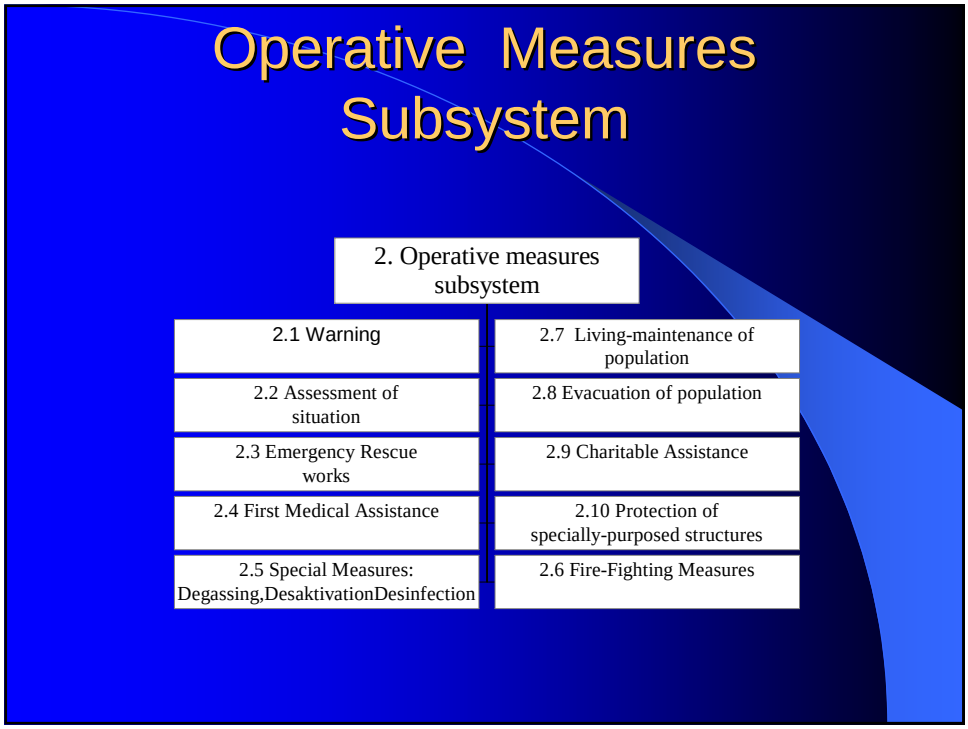
Seismic risk reduction system on territory of the Republic of Armenia includes 3 subsystems:

- Subsystem of preventive measures
- Subsystem of operative measures
- Liquidation of consequences and recovery actions' subsystem

Subsystem of Preventive Measures



Operative Measures Subsystem

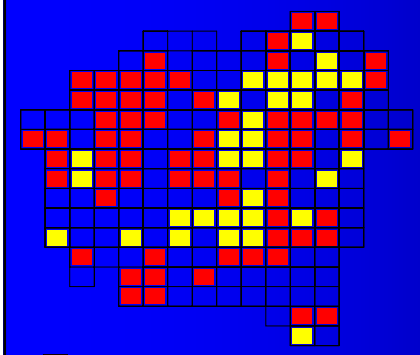


Liquidation of Consequences and Recovery Operations Subsystem

Liquidation of consequences and Recovery operations Subsystem

3.1.Preliminary investigation and assessment of consequences	3.8 Construction and Recovery Actions
3.2. Sanitary and Epidemiologic measures	3.9 Operative engineering-technical preventive actions
3.3 Emergency-recovery actions on dangerous technical structures	3.10 Works on clearing of debris and roads
3.4 Emergency reinforcement of buildings or its demolition	3.11 Recovery actions of communications
3.5 Emergency-recovery works of gas-mains and gas-storage	3.12 Emergency-recovery actions of municipal economy
3.6 Actions in variou s fields and branchs	3.13 Works on clearing from constructional and living dust
3.7 Social maintenance of injured population	3.14 Emergency-recovery works of energetics system

Seismic Risk Assessment Map for Yerevan-city



High risk
Moderate risk
No risk practically

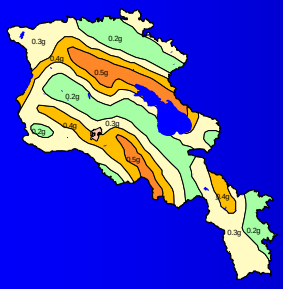
Map of distributing of seismic risk level by sectors with one square km. area on the territorry of Yerevan city

- The following three factors has been used during seismic risk assessment for yerevan-city:

- Seismic hazard level in Yerevan-city,estimated on the series of seismic events,
- Earthquake resistance of buildings and structures estimated according for ground conditions and design types,
- Size of population residing in buildings and structures which have different earthquake resistance.

Analysis of these datas has shown that about 26 sq.km.(15% of total area) of the Yerevan-city is situated in high seismic risk zone.

The New Seismic zonation Map

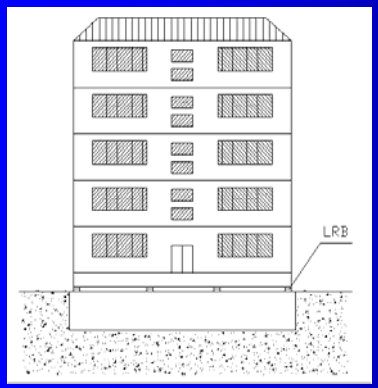


Scale M 1:500000

- **0.4g<a<0.5g**
- **0.3g<a<0.4g**
- **0.2g<a<0.3g**
- **0.1g<a<0.2g**

- The map was compiled in collaboration with Swiss Seismological Survey
- The Map was submitted to the Government of Armenia in 1998 and serves as actual basis for earthquake engineering realization in the territory of Armenia

New Methods of Increasing the Earthquake Resistance of Existing Buildings



The 5-storey building with seismic isolation

- Using absorbers of seismic vibrations in many-storied frame buildings on the level of floors;an example is construction “ Additional isolated upper floor”-(AIUF).
- Using the seismic isolation as in existing as well as in newly designed masonry buildings on the level of foundations-“Laminated rubber bearings”-(LRB).
- Both these methods have already used in Vanadzor-city-earthquake-stricken area and allow to increase seismic resistance of buildings without eviction of dwellers.

Main International Organizations Participation in Armenia

- UNCTAD-Unated Nations Conference on Trade and Development
- UNESCO-United Nations Educational,Scientific and Cultural Organization
- UNIDO-United Stations Industrial Development Organization
- UNDP-Unated Nations Development Program
- WHO-World Health Organization
- WMO-World Meteriological Organization
- OCHA-Office for the Coordination of Humanitarian Affairs
- ARCS-Armenian Red Cross Society
- SRCS-Swiss Red Cross Society

International Agreements and Programs

Nowadays the Armenian NSSP takes part in the following international agreements and programs:

- **Japan**

Memorandum between the Republic of Armenia and the Government of Japan on cooperation in the field of seismic protection on 25th of December 2001

-Iran

Memorandum of mutual understanding between the NSSP RA and the Geophysical Institute of Tehran University

Memorandum between the Republic of Armenia and the Republic of Iran on cooperation in the field of seismic protection

- **Russia**
- **II Agreement on Scientific- Technical Cooperation with the Institute of the Earth's Physics of the Russian AS.**

International Agreements and Programs

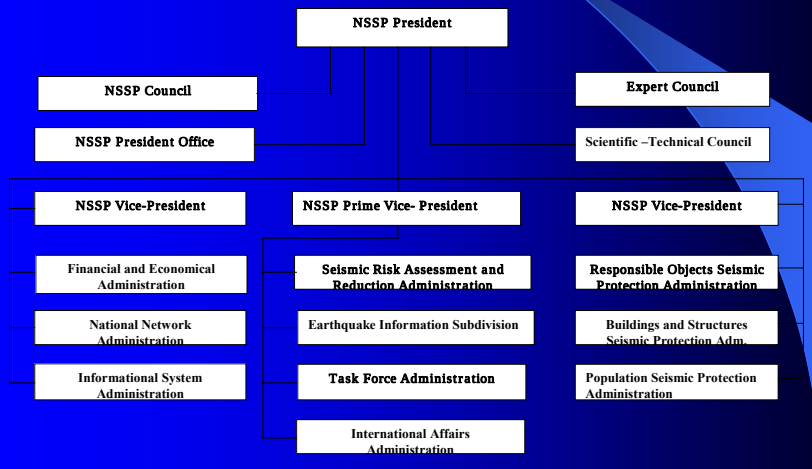
Switzerland

- **П Collaboration with the Swiss Federal Institute of Technology (ETH, Zurich) and operating at the same Institute the Swiss Scismological Service (SSS).SMACH accelcrographs**
  P Collaboration with the Swiss Disaster Relief (SDR)

USA

- **П Agreement with the US Geological Survey (USGS) on "Creation of the Station of Global Seismographic Network" (IRIS)**
  П Agreement with the National Aeronautics and Space Administration (NASA) about cooperation in the field of space geodesy
  П Agreement with the Massachusetts Technological Institute (МГТ) on "Study of Regional Deformations in the Territory of Armenia"

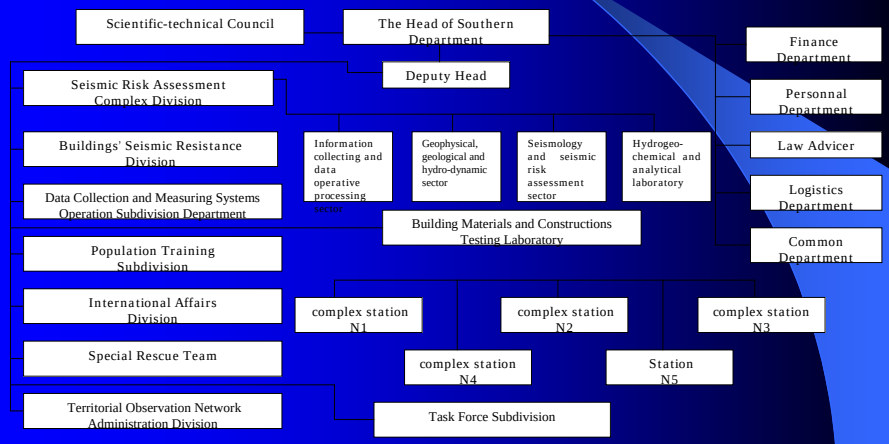
Armenian NSSP Structure and Details of Work



Structure of the Regional Departments of the Armenian NSSP

The Central Department of NSSP(center is Yerevan city) works in the region of Yerevan, Armavir,Aragatsotn,Ararat,Guegharkounik and Vayots-Dzor.
The Southern Department of NSSP (center is Kapan city) works in the region of Syunik.
The Northern Department (center is Giumri city) works in the regions of Shirak,Tashir,Tavysh.

The Structure of the Southern Department of the Armenian National Survey for Seismic Protection



The Activity of Task Force-1

- The lessons,learned from Spitak earthquake.

showed the necessity of prompt response to disaster and protection of population from strong earthquakes.As a result the fully equipped Task Force was organized under the Armenian NSSP.

- **The main goal of Task Force** is to reduce the possible consequences of disaster by conducting operative actions in case of emergency.

The Activity of Task Force-2

- Types of emergency:

1. The are two types of emergency situations in the Caucasus region:
2. The earthquake on the territory of Armenia and adjacent areas caused damage and various victims
3. The threat of destructive earthquakes in Armenia and adjacent areas

The Functions and Duties of Head of the Task Force

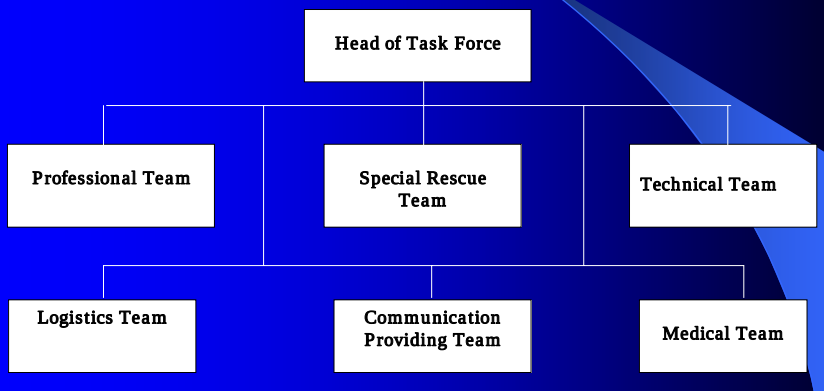
- Functions:

1. Formation of the Task Force and Managing
2. Working out of plans of Task Force before and after Emergency
3. 3. Defining the number of personnel of Task Force, as well as the necessary tasks which depends on the type of emergency
4. Preparing and conduction of training exercises

- Duties:

1. Notification the personnel of Task Force after receiving of information about emergency
2. Informing to Head of the Department about gathering all personnel of Task Force
3. All teams of Task Force must be operated by plans drafted beforehand in disaster area
4. Sending the periodical information about the results of implementation of these plans to Expert Council

The Structure of Task Force



The Structure of the Emergency Management