

**THE REPUBLIC OF ARMENIA**

**R E S O L U T I O N**

**7 June, 1999 N 392**

**Yerevan**

**About the Complex Program of Seismic Risk Reduction in the Territory of Yerevan**

The Government of the Republic of Armenia r e s o l v e s to:

1. Approve the Complex Program of Seismic Risk Reduction in the Territory of Yerevan. (SRRY).
2. In the time of the seismic risk reduction concerning problem's implementation, all the ministries, administrations, municipal bodies have to be guided by the complex program of SRRY.
3. The present resolution is valid from the moment of its proclamation.

**Prime-Minister of the  
Republic of Armenia**

**A. DARBINYAN**

# **COMPLEX PROGRAM ON SEISMIC RISK REDUCTION IN THE TERRITORY OF YEREVAN**

## **I. GENERAL PROVISIONS**

### *1. Introduction*

The present program is developed according to the State Complex Program on Seismic Risk Reduction in the Territory of Armenia (SCPSRRRA)

For the following reasons the Seismic Risk Reduction in the Territory of the capital of RA Yerevan city is separate, independent and critical issue:

- The concentration of the great part of the population in Yerevan
- The concentration of the Governmental bodies in Yerevan
- seismically not resistant residential and construction networks, that is, their seismic resistance level is significantly lower than the seismic hazard level
- hazardous facilities located in the territory of Yerevan
- insufficient preparedness of the population and Governmental bodies to the operative actions related to seismic risk reduction.

The Program is developed by authors (under supervision of Prof. S. Balassanian, NSSP RA), presenting concerned ministries and institutions, and non-governmental organizations dealing with various aspects of seismic risk reduction complex problems..

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All the parts of the program have been successfully approved at the most important international scientific conferences on seismic risk reduction and the principal two ones were dedicated to the fifth and tenth anniversary of the Spitak 1988 devastating earthquake.

### *2. Problem Description*

Yerevan as well as a number of capitals of Armenia destroyed by strong earthquakes in ancient times, not once has been affected by seismic shakings. One of those earthquakes has fully destroyed the city in 1679.

Considering the reoccurrence of strong seismic events, it is not difficult to guess, that an earthquake M-7.0, which intensity value is 10 on MSK-64 scale will strike Yerevan.

Being aware how the earthquake of I=9-10 intensity can affect the territories of Armenia, for example the Spitak earthquake in 1988, it is not difficult to suppose what would happen to the capital of Armenia if a strong earthquake would occur in Yerevan.

Alike scenario was studied in NSSP RA. The NSSP and western specialists consider that in case of not reducing the seismic risk in Yerevan by the special state program, the great number of victims and losses will bring to the situation where it is impossible to show effective help to population and liquidate the destructions.

## II. PROGRAM JUSTIFICATION

### *3.The State of the Arts*

In NSSP the seismic risk in the territory of Armenia is determined by the international standards. It was stated that Yerevan is mostly prone to the seismic risk.

In picture 1 it is presented the first map of seismic risk of Yerevan compiled in NSSP, where it is shown that the 15% (23 km<sup>2</sup>) of the territory of Yerevan is situated in seismic active zone. It means that the 26% of the population of the city is exposed to high seismic risk.

Taking into account that serious damages can occur in average risk zone as well, it becomes clear, that Yerevan in general, is extremely vulnerable from seismic viewpoint.

Considering the abovementioned it is essential to create a long-term state program related to seismic risk reduction in the territory of Yerevan.

- territory of Armenia is practically entirely situated in a seismically active zone:
- earthquake power reaches M=7.1 (present time period) and M=7.5 (according to historical and paleoseismical assessment), the average depth of focuses is equal to 10km, all the focuses related to up to 1sm/year active faults of average drift, the duration of destructive earthquakes in a case of unfavorable ground conditions could reach to about 1 minute, reoccurrence of earthquakes with the magnitude M=5.5 is 30-40 years.

### *4.The General Objective and the Main Problems to be Solved*

The general objective of the program is the seismic risk reduction in the territory of Yerevan by the level of the country sustainable development and population safety.

The Program includes the solution of the three main problems:

- 1.Seismic hazard prediction,
- 2.Seismic risk assessment,
- 3.Seismic risk reduction.

4.1 Seismic hazard prediction includes two main parts:

- primary seismic hazard prediction,
- secondary seismic hazard prediction.

The primary hazard is a ground shakings, cracks, and earth's crust faults, that is an earthquake. The secondary hazard is the natural and technogenic phenomena according to earthquakes.

In the number of natural phenomena are: landslides, faults, downpours, collapses, different sediments, ground dilution.

In the number of technogenic phenomena are: accidents, fires, deluges.

Prediction of the primary hazard includes the long-term and current seismic hazard assessment. The long-term hazard assessment means to predict the mostly possible temporary cracks location and strength in consequently raising scales in the territory of Armenia.

The primary hazard for Yerevan defined by Yerevan and essential facilities Seismic Micro Zonation (SMZ) Scale=1:5000, Scale=1:10000.

Current Seismic Hazard Assessment means prediction of possible strong event (intensity value 7 on MSK-64 scale) location, strength and time in the territory of Yerevan and in locations close to it.

4.2 Seismic Risk Assessment is a complex program, the solution of which makes us to take into account all the above- mentioned objective and subjective factors. The first approach to the

solution of this problem is the first map of seismic risk for the territory of Yerevan passed in the international examination and compiled by the Armenian NSSP where the seismic hazard, compared with buildings and structures seismic resistance influenced on the risk level, are used.

According to the map on the 1 picture, the most part of Yerevan is liable for the maximum seismic risk. The seismic risk proper assessment would let us implement an effective program of its reduction.

4.3 Seismic risk reduction supposes the following problems solution:

- elaboration and acceptance of normative documents and proper rules, guaranteed their juridical base for seismic risk reduction,
- establishment of a center for seismic risk reduction management on the base of the Armenian NSSP,
- early warning,
- reduction of a territory vulnerability,
- preparedness and training of population,
- preparedness of local authorities for risk reduction management,
- medical preparedness,
- creation of task forces,
- organization of rescue activities,
- creation of insurance system,
- liquidation of population migration.

### *5.Expected Results*

Implementation of this program will give the following results:

- a new perspective long-term state policy will be formed; seismic risk reduction directed to a population security and development of Yerevan,
- a seismic risk reduction planned system in the territory of Yerevan by NSSP RA, which will be implemented by the ministries, departments, public organizations and local authorities, otherwise, practically jointly with all the publicity proper to an international approach to the solution of this most difficult problem,
  - the local authorities general disaster sustainability will be increased,
  - preconditions will be created for great financial investments in economics, and submitted to higher seismic risk in Yerevan,
  - the newest technologies for seismic risk reduction will be involved in all the directions: from seismic risk prediction till seismic resistant building and population preparedness, new technologies deposit, which could be possible to use in all the other fields of state activities,
  - the technical and knowledge bases for insurance, science and engineering development will be improved.

Above-mentioned expected results could be got by the implementation and realization of the programs, supplemented each other by three main directions:

1. In the field of Seismic Hazard Prediction:

- further development of national observations, also collecting data, national center of implementation and analyzing,
- future development of dates and knowledge base, prediction of seismic hazard according to GIS and experimental systems and it's mapping,
- implementation of special rules of prediction information transferring to the President of the Republic of Armenia, the Government of the RA, responsible ministries, departments and population.

## 2. In the field of Seismic Hazard Assessment:

- creation of databases and knowledge clearing house,
- multi-parameter analysis of risk,
- seismic risk mapping in GIS format.

## 3. In the field of Seismic Risk Reduction:

-early warning system creation in the case of possible strong earthquake in the territory of Yerevan,

-Yerevan deficiency reduction by seismic resistance heightening of existing buildings and structures, creation of effective landslide resistant engineering structures and landslide locations, new seismic resistant building on the base of new national norms, confirmed by the Ministry of Urbanization of RA and other activities of engineering protective direction of the territory of the republic,

- raising of population preparedness level by organizing special radio-TV programs according to published and distributed literature and papers, elaborating and using of training programs about the actions before, during and after the earthquake, psychological preparing of different groups of people, teaching to an individual and collective methods of help, creating a net of teaching prepared informers for protection of population in all the districts of Yerevan from earthquakes and other disasters connected with it. All the mentioned programs are realized by applying a special approach to each kind of lays of society for the different lays of people,

-preparedness of local authorities to the risk management by elaboration of methodological sources about the actions in a case of strong earthquakes or of it's hazard, elaboration of practical course material about making decisions in a case of strong earthquakes or of it's hazard, preparedness and training of the teaching base improvement of the senior workers of local authorities,

-medical preparedness raising through elaboration and implementation of automatic program of disaster medical information-management, elaboration and deposition of disaster medical survey development program on a national level, discussion of damage peculiarities in the aim of risk prediction of possible hygienic loss(victims and injured), elaboration of medical-geographic maps

-further development of material-technical base of special rescue brigade of NSSP RA and special rescue brigades of EMA RA, preparedness and training of rescues by getting international certificates, including rescue brigades of Yerevan having training courses each year,

-liquidation of migration of population by elaboration of stable activity guaranteeing program of primary necessity infrastructure in a case of earthquakes,

-psychological vulnerability reduction of a person by elaboration of collecting information from the proper international organizations, elaboration of stress overcoming methods in conditions of Yerevan, elaboration of teaching programs of existing center base.

The implementation of this Program will give an opportunity to increase the preparedness level of Yerevan and its population during strong earthquakes, which will result to the most social-economic stability of a country by reduction of finances for earthquakes liquidation results.

## *6.The Main Users*

The most vulnerable sections of population.

The specialists working in the field of disaster management.

The school and pre- school teachers.

The major employees of the governmental institutions.

The major employees of civil authorities and self-governed institutions.

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## *7.The Strategy and Implementation of the Program*

The strategy:

The program is carried out by the NSSP RA jointly with all the concerned ministries and departments. The NSSP RA, considered as a customer and responsible executor, carries responsibility for the implementation of the program. The basic principles of seismic risk reduction strategy in the territory of Yerevan as follows:

- preparedness priority over the recovery,
- priority of all the elements of seismic risk reduction in the field of preparedness,
- unity of efforts of ministries, civil authorities, departments, public organizations and generally specially completed efforts of society,
- simultaneous realization of sub-programs in all the directions of seismic risk reduction sub-problems,
- internationalization of the program by involving the best national and international centres in it's implementation,
- involving of foreign donors and investors for financing the various sub-programs of the program,
- multistage nature of the program formed from short-term (up to 1 year), medium-term (up to 5 years) and long-term (up to 20 years) sub-programs, which are implemented by the various ministries and departments.

Implementation

The program will be implemented by the various ministries, departments and public organizations (see the appendix).

The NSSP RA is responsible for the implementation of the program in case of necessity the NSSP RA is able to involve different foreign experts for implementation of the various parts of the program by means of sponsors. The implementation of the program will increase the preparedness level of Yerevan and its population at the time of strong earthquakes. Thus, it will result to the next seismic hazard significant reduction, which, generally, will support the population stable social-economic development.

### *8.Special Concepts*

During the program implementation the big progress will be gained in various directions:

- improvement of the surroundings condition and it's preservation,
- activation of public organizations and their involve to the general management system,
- organization of teaching children to the skills of vital necessity,
- rehabilitation of social-medical condition of the invalids and their involving into the general management system,
- activation of national minority and their involving into the field of social collaboration.

### **III. THE OBJECTIVE OF PROGRAM DEVELOPMENT**

- creation of seismic risk reduction modern system and development of the State system of Yerevan for protection of society stable development and reduction of population and their property vulnerability at the time of earthquakes,
- creation of conditions for preparedness of population and their stable development,
- creation of population training effective system for existence in the seismoactive conditions of Yerevan.

## **IV. THE IMMEDIATE OBJECTIVES, RESULTS AND ACTIVITIES**

### 1. Immediate objective 1:

Population vulnerability reduction due to earthquakes and other disasters connected with them.

#### 1.1. Output 1.

Progressed prediction of seismic hazard and other secondary related hazardous phenomena.

##### 1.1.1. Activity 1.

Development of seismic hazard and other secondary hazards existed monitoring based on the national multiparameter observation of the NSSP RA.

##### 1.1.2. Activity 2.

Development and approval of the existing information and analytical system.

##### 1.1.3. Activity 3.

Extension of the informational base on seismic precursors.

##### 1.1.4. Activity 4.

Implementation of proper experimental systems for prediction of seismic hazards and other related hazards.

##### 1.1.5. Activity 5.

Seismic hazard short-term, medium-term and long-term mapping.

### 2. Immediate Objective 2.

Seismic risk assessment.

#### 2.1. Output 1.

Seismic risk maps.

##### 2.1.1 Activity 1

Creation of data base.

##### 2.1.2 Activity 2

Development of GIS software.

##### 2.1.3 Activity 3

Risk computation and mapping.

##### 2.1.4. Activity 4

Production of maps.

### 3. Immediate objective 3

Seismic risk reduction in the territory of Yerevan.

#### 3.1 Output 1

Center for seismic risk management was established on a base of the Armenian NSSP and operational communication network

#### 3.1.1 Activity 1

Development of an efficient channel between responsible national organizations and local self-governed institutions of Yerevan.

#### 3.1.2 Activity 2

Application of the new technology to assess the scale and character of disasters to support decision making in the allocation of resources for rescue and emergency assistance in Yerevan.

#### 3.1.3 Activity 3

Creation of database on the components of seismic risk reduction

#### 3.1.4. Activity 4

Installation of the communication network between Armenian NSSP and local self-governed institutions of Yerevan.

### 3.2 Output 2

Creation of an early warning system for strong earthquakes on the whole territory of Yerevan.

#### 3.2.1 Activity 1

Development of the project of the early warning system for strong earthquakes.

#### 3.2.2 Activity 2

Upgrading of the national observation network of the Armenian NSSP for use in the early warning system of Yerevan.

#### 3.2.3 Activity 3

Creation of software for the early warning system.

#### 3.2.4. Activity 4

Development of an alarm system network for early warning.

### 3.3 Output 3

To decrease the vulnerability of buildings and structures, lifeline services and infrastructure of settlements in Yerevan.

#### 3.3.1 Activity 1

Development of programs to decrease the vulnerability of territories in a case of strong earthquakes.

#### 3.3.2 Activity 2

Seismic microzonation of Yerevan according to the new methods.

#### 3.3.3 Activity 3

Detailed mapping of buildings of Yerevan and decision making of design seismic resistance of every structure.

#### 3.3.4 Activity 4

Creation of ground strong motion database and obtaining of synthesized accelerograms for different ground types of Yerevan.

#### 3.3.5 Activity 5



Implementation of research to reveal existing technical condition and damage extent of buildings and structures in Yerevan, in accordance with the requirements of the new method.

#### 3.3.6 Activity 6

Development and application of complex approach assessment of influence of strong earthquakes.

#### 3.3.7 Activity 7

Improvement and application of technologies for increase of seismic resistance of buildings and structures considering the peculiarities of Yerevan.

#### 3.3.8 Activity 8

Development and application of methods of engineer protection of cities, settlements, residential, urban and industrial facilities, transportation networks (roads and railroads) as well as lifeline services from strong local geological and hydro-geological processes conditioned by strong earthquake

#### 3.4 Output 4

Development of comprehensive management training program for the education of major employees of the mayory and communities of Yerevan in the conditions of strong earthquakes or its real hazard.

##### 3.4.1 Activity 1

Organization of training courses, special TV/radio programs for the education of major employees of the mayory and communities of Yerevan in the area of risk management

##### 3.4.2 Activity 2

Creation of videos and preparation of normative documents on disaster management and their using in the training program.

##### 3.4.3 Activity 3

Organization of practical training in the form of exercises, analyzing of specific emergency situations and development of decision making process in disaster management.

#### 3.5 Output 5

Increased medical preparedness.

##### 3.5.1 Activity 1

Development of informational management system for disaster medical services using experience of leading countries.

##### 3.5.2 Activity 2

Forecasting of the risk of possible medical losses rising during strong earthquakes.

##### 3.5.3 Activity 3

Creation of mobile autonomous units for extending specialized medical assistance within the areas of impact.

#### 3.6 Output 6

Capacitated Task Force on the basis of governmental and non-governmental organizations of Yerevan.

### 3.6.1 Activity 1

Physical renovation of the training facilities of Task Force and their requirement with modern communication hardware.

### 3.7 Output 7

Network of mobile search and rescue teams.

#### 3.7.1 Activity 1

The modernization of the technical base and the equipment for search and rescue teams.

### 3.8 Output 8

Developed package of measures to encourage people against migrating from disaster affected areas.

#### 3.8.1 Activity 1

The development of programs to reduce the vulnerability of the territory of Yerevan in disaster prone areas.

#### 3.8.2 Activity 2

Development of a program to protect lifeline services in disaster prone areas.

#### 3.8.3 Activity 3

The establishment of an information network for the monitoring of population migration.

#### 3.8.4 Activity 4

Specification of planning structures of Yerevan and its conformity with the acting seismic norms and different seismic risk zones.

#### 3.8.5 Activity 5

Subdivision of financial sub-constructive elements and approval of specific conditions and regimes (industry, building base, etc.).

#### 3.8.6 Activity 6

Distribution of transport, engineering, power supply substructures as well as education and health service, complex planning organizations.

#### 3.8.7 Activity 7

Planning and territorial organization of material objects (buildings, structures).

### 3.9 Output 9

Created legal base to reduce seismic risk on the territory of Yerevan.

#### 3.9.1 Activity 1

Development and approval of normative acts (documents) regulating the actions on seismic risk reduction on the territory of Yerevan.

## V. PROGRAM INPUTS

Objectives	Inputs by the Governmental Organizations of the Republic of Armenia and Yerevan	Donors Input
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1. Seismic hazard prediction	Office space, relevant specialists and their knowledge and experience, technical means, operational and maintenance expenses of buildings and equipment, monitoring equipment and gadgetry, maintenance expenses, software	Financial support, methodological and technical assistance; consultative assistance, expert assessments, business trip expenses
2 Seismic risk assessment	Office space, relevant specialists and their knowledge and experience, operational and maintenance expenses of buildings and equipment, maintenance expenses, software	Financial support, methodological and technical assistance; consultative assistance, expert assessments, business trip expenses
3. Seismic risk reduction	Office space, relevant specialists and their knowledge and experience, operational expenses of communication system, expenses for using of fund materials, business trip expenses, a part of training expenses, database on disaster medicine, consultations, monitoring systems operational expenses, design, software, laboratory and natural condition testing, gadgetry and equipment.	Financial support, methodological and technical assistance; consultative assistance, expert assessments, business trip expenses

## VI. PROGRAM RISK

The change in the policies of the Government of the Republic of Armenia towards priority of the program of the seismic risk reduction on the territory of Armenia.

The absence of donors for the implementation of the program.

A change in the donors policy and suspension of financial support from the side of donors.

## VII. MAIN OBLIGATION

Any activity within the framework of the National Project should not contradict to the requirements of the legislation of the Republic of Armenia.

## VIII. REPORTING

For the program implementation reporting should be realized for two stages:

first stage is reporting of organization-executors to responsible executor (coordinator) of the program;

second stage is reporting of responsible executor (coordinator) to the Government.

First-stage reporting will be realized on specific bilateral agreements concluded between responsible executor and organization-executor.

Second-stage reporting will be realized in accordance with the reporting plan of the responsible executor to the Government. Reporting plan of the responsible executor to the

Government should include reporting of the responsible executor at least once every six month during the whole duration of the program implementation. The Government may request additional reporting by special order, giving at least three months notice for the responsible executor before report consideration.

## **IX. LEGAL CONDITIONS**

Any changes or additions in the program can be made only on agreement between the Government and responsible executor.

All activities under the Program should correspond to the legislative requirements of RA.

## **X. PROGRAM STRUCTURE**

The program structure is presented on Appendix 2 in the scheme form.

Program executors by the activities (see. section IV) are:

1. National Survey for Seismic Protection of the RA  
1.1.1-1.1.5, 2.1.1-2.1.4, 3.1.2-3.1.4; 3.2.1- 3.2.4, 3.3.1, 3.3.2, 3.4.1-3.4.3, 3.6.1,-3.8.1
2. Emergency Management Administration (EMA) under the Government of the RA  
3.1.2, 3.1.3, 3.4.1 - 3.4.3, 3.6.1, 3.7.1; 3.7.1, 3.8.1 - 3.8.3
3. Ministry of Urban Development of the RA  
1.1.2 - 1.1.4; 2.1.1, 3.3.1;;3.3.1; 3.3.2, 3.3.3
4. Ministry of Internal Affairs and National Security of the RA  
1.1.4; 2.1.1, 3.1.3
5. Ministry of Science and Education of RA  
2.1.1; 3.1.3
6. National Academy of Science (Institute of Geophysics and Engineering Seismology, Institute of Geological Sciences)  
1.1.2 - 1.1.4; 2.1.1, 3.1.3
7. Ministry of Industry  
1.1.2 - 1.1.4; 2.1.1, 3.1.3
8. Ministry of Post and Telecommunications  
3.1.1; 3.1.4; 3.2.1; 3.2.2
9. Ministry of Transport  
1.1.2 - 1.1.4; 2.1.1, 3.1.3
10. Ministry of Energy  
1.1.2 - 1.1.4; 2.1.1, 3.1.3
11. Ministry of Environment of the RA  
1.1.2 - 1.1.4; 2.1.1, 3.1.3

12. Ministry of Agriculture

3.1.3; 3.3.1

13. Mayory of Yerevan

3.1.1, 3.1.4, 3.2.4, 3.3.3, 3.4.1, 3.4.3, 3.6, 3.7, 3.8.2, 3.8.1-3.8.7, 3.9.1

14. Nuclear Regulatory Authority of the RA

1.1.2-1.1.4, 2.1.1

15. Hydro-meteorological Service

1.1.2 - 1.1.4; 2.1.1

16. Armenian NPP

1.1.2 - 1.1.4; 2.1.1

17. Institute of preparation and retraining of specialists of Emergency Management Administration under the RA Government

3.4.1

18. National Disaster Medical Center of Ministry of Health of the RA

3.5.1 - 3.5.3

19. Local Authorities

3.1.3, 3.3.1

20. Armenian Red Cross Society

3.1.3

21. TV program "Emergency Channel"

3.4.1; 3.4.2

## XI. TIME- TABLE OF THE PROGRAM IMPLEMENTATION

NN	Activity	Dates of Execution							
		99	00	01	02	03	10	20	30
1	Population vulnerability reduction due to earthquakes and other disasters connected with them.								
1.1	Progressed prediction of seismic hazard and other secondary related hazardous phenomena.								
1.1.1	Development of seismic hazard and other secondary hazards existed monitoring based on the national multiparameter observation of the NSSP RA.								
1.1.2	Development and approval of the existing information and analytical system								
1.1.3	Extension of the informational base on seismic precursors.								

1.1.4	Implementation of proper experimental systems for prediction of seismic hazards and other related hazards.								
1.1.5	Seismic hazard short-term, medium-term and long-term mapping.								
2	Seismic risk assessment								
2.1	Hazard and risk maps								
2.1.1	Creation of data base								
2.1.2	Development of GIS software								
2.1.3	Risk computation and mapping								
2.1.4	Production of maps								
3	Seismic risk reduction in the territory of Yerevan.								
3.1	Center for seismic risk management was established on a base of NSSP RA and operational communication network								
3.1.1	Development of an efficient channel between responsible national organizations and local self-governed institutions of Yerevan.								
3.1.2	Application of the new technology to assess the scale and character of disasters to support decision making in the allocation of resources for rescue and emergency assistance in Yerevan.								
3.1.3	Creation of database on the components of seismic risk reduction								
3.1.4	Installation of the communication network between Armenian NSSP and local self-governed institutions of Yerevan.								
3.2	Creation of an early warning system for strong earthquakes on the whole territory of Yerevan.								
3.2.1	Development of the project of the early warning system for strong earthquakes.								
3.2.2	Upgrading of the national observation network of the Armenian NSSP for use in the early warning system of Yerevan.								
3.2.3	Creation of software for the early warning system.								
3.2.4	Development of an alarm system network for early warning.								
3.3	To decrease the vulnerability of buildings and structures, lifeline services and infrastructure of settlements in Yerevan.								
3.3.1	Development of programs to decrease the vulnerability of territories in a case of strong earthquakes.								

3.3.2	Seismic microzonation of Yerevan according to the new methods.								
3.3.3	Detailed mapping of buildings of Yerevan and decision making of design seismic resistance of every structure.								
3.3.4	Creation of ground strong motion database and obtaining of synthesized accelerograms for different ground types of Yerevan.								
3.3.5	Implementation of research to reveal existing technical condition and damage extent of buildings and structures in Yerevan, in accordance with the requirements of the new method.								
3.3.6	Development and application of complex approach assessment of influence of strong earthquakes.								
3.3.7	Improvement and application of technologies for increase of seismic resistance of buildings and structures considering the peculiarities of Yerevan.								
3.3.8.	Development and application of methods of engineer protection of cities, settlements, residential, urban and industrial facilities, transportation networks (roads and railroads) as well as lifeline services from strong local geological and hydro-geological processes conditioned by strong earthquake.								
3.4	Development of comprehensive management training program for the education of major employees of the mayory and communities of Yerevan in the conditions of strong earthquakes or its real hazard.								
3.4.1	Organization of training courses, special TV/radio programs for the education of major employees of the mayory and communities of Yerevan in the area of risk management.								
3.4.2	Creation of videos and preparation of normative documents on disaster management and their using in the training program.								
3.4.3	Organization of practical training in the form of exercises, analyzing of specific emergency situations and development of decision making process in disaster management.								

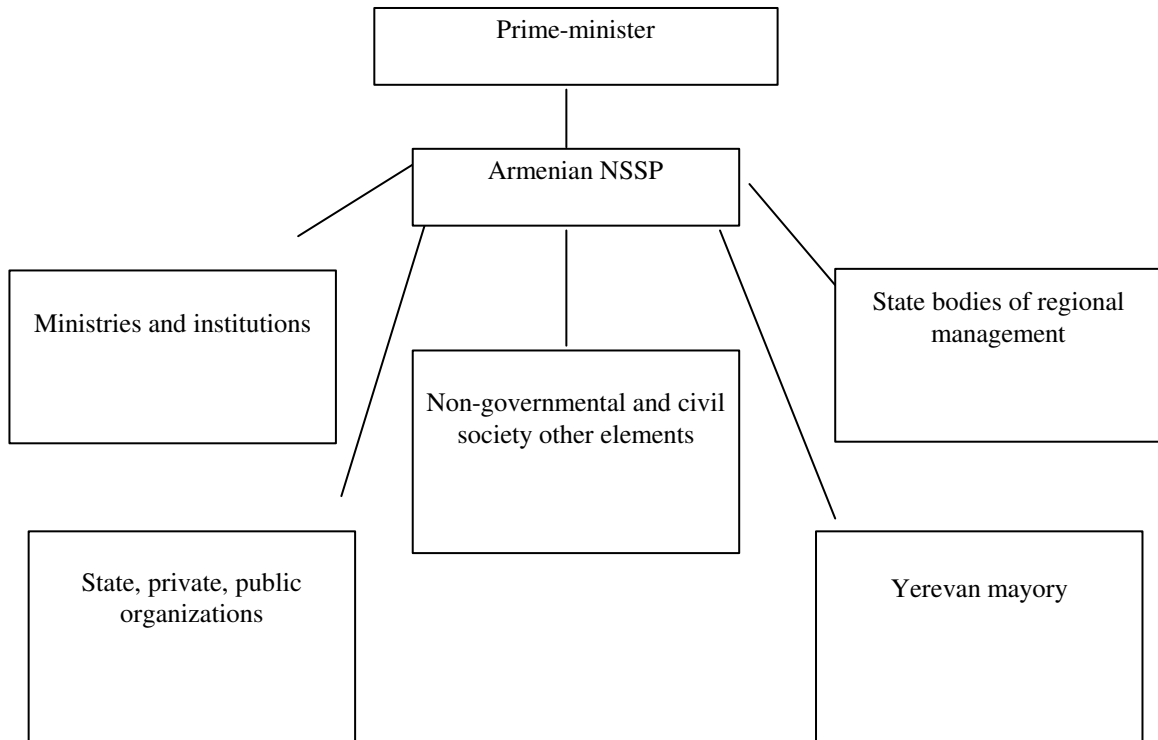
3.5.	Increased medical preparedness.								
3.5.1.	Development of informational management system for disaster medical services using experience of leading countries.								
3.5.2.	Forecasting of the risk of possible medical losses rising during strong earthquakes.								
3.5.3.	Creation of mobile autonomous units for extending specialized medical assistance within the areas of impact.								
3.6.	Capacitated Task Force on the basis of governmental and non-governmental organizations of Yerevan.								
3.6.1.	Physical renovation of the training facilities of Task Force and their requirement with modern communication hardware.								
3.7.	Network of mobile search and rescue teams.								
3.7.1.	Network of mobile search and rescue teams.								
3.8.	Developed package of measures to encourage people against migrating from disaster affected areas.								
3.8.1.	The development of programs to reduce the vulnerability of the territory of Yerevan in disaster prone areas.								
3.8.2.	Development of a program to protect lifeline services in disaster prone areas.								
3.8.3.	The establishment of an information network for the monitoring of population migration.								
3.8.4.	Specification of planning structures of Yerevan and its conformity with the acting seismic norms and different seismic risk zones.								
3.8.5.	Subdivision of financial sub-constructive elements and approval of specific conditions and regimes (industry, building base, etc.).								
3.8.6.	Distribution of transport, engineering, power supply substructures as well as education and health service, complex planning organizations.								
3.8.7.	Distribution of transport, engineering, power supply substructures as well as education and health service, complex planning organizations.								



3.9.	Created legal base to reduce seismic risk on the territory of Yerevan.								
3.9.1.	Development and approval of normative acts (documents) regulating the actions on seismic risk reduction on the territory of Yerevan.								
		Total duration of the program is 32 years							

## Appendix 1.

### Scheme of Seismic Risk Reduction Management



## Appendix 2.

National actors involved in SRRCP of Yerevan

1. EMA
2. NSSP
3. Defense Ministry
4. Internal Affairs Ministry
5. Health Ministry
6. Foreign Affairs Ministry
7. Nature Protection Ministry
8. Ministry of Agriculture
9. Ministry of Energy
10. Ministry of Social Welfare
11. Ministry of Post and Communication
12. Ministry of Transport
13. Ministry of Urban Development
14. Ministry of Economics and Finance
15. Ministry of Education and Science
16. Ministry of Industry and Trade
17. Central Bank of RA
18. Metereological Agency
19. EMA Personal Preparedness
20. National Academy of Science
21. Armenian State atomsupervision
22. Marz Governments (10)
23. Yerevan mayory
24. Local governments
25. Non-governmental organizations:
  - Armenian Red Cross Society
  - Armenian Producers Union
  - "Seismic band" Telecast

**Appendix 3.**

