PPRD EAST 2
Together for a safer future

Prevention, Preparedness and Response to Natural and Man-made Disasters in the EaP Countries – PPRD East 2
EuropeAid/135314/C/SER/MULTI - Contract N° 2014/352-249

Ministry of Territorial Administration
and Emergency Situations of the Republic of Armenia
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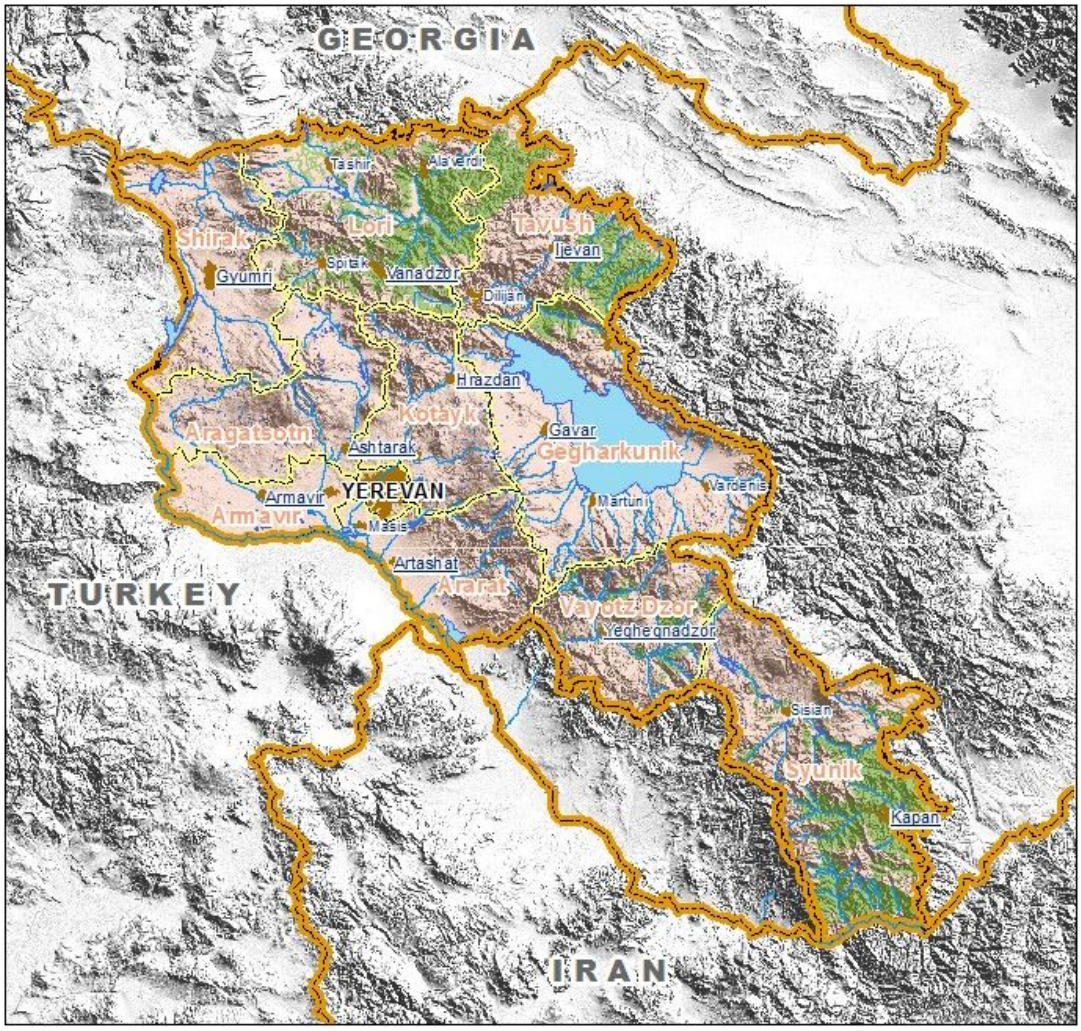
Country Profile

ARMENIA



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MWH

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- **Hydrometeorology and Monitoring Service SNCO (State Non-Commercial Organization)**

- **Rescue Department of City of Yerevan**
- **National Academy of Sciences, Institute of Geological Sciences**
- **Ministry of Foreign Affairs**
- **Ministry of Agriculture:**
  - **State Committee of Water Economy**
- **Ministry of Finance**
- **Ministry of Economy**
- **Ministry of Energy and Natural Resources**
- **Ministry of Healthcare**
- **Ministry of Nature Protection, Water Resource Management Agency**
- **National Security Service**
- **National Platform for Disaster Risk Reduction ARNAP**
- **Armenian Red Cross Society**
- **Oxfam**

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List of Content

Abbreviations

ADB	Asian Development Bank
AMD	Armenian Dram
APSFR	Areas of Potentially Significant Flood Risk
ARS	Armenian Red Cross Society
ASHMS	Armenian State Hydro-Meteorological Service
BMO	Basin Management Organisation
BSEC	Black Sea Economic Cooperation
CAC DRMI	Central Asia and Caucasus Disaster Risk Management Initiative
CAREC	Central Asia Regional Economic Cooperation Programme
CD	Community of Democracies
CE	Council of Europe
CENS	Centre for Ecological-Noosphere Studies of the National Academy of Sciences
CEP	Civil Emergency Planning
CEPC	Civil Emergency Planning Committee
CIS	Commonwealth of Independent States
CJSC	Special Mountain Rescue Service
CMC	Crisis Management Centre
CMEP	Civil Military Emergency Preparedness Program
CMSA	Crisis Management State Academy
COSMO	Consortium for Small-scale Modelling
CP	Civil Protection
CSTO	Collective Security Treaty Organization
DLD	Disaster Loss Data
DM	Disaster Management
DRA	Disaster Risk Assessment
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
DWD	Deutscher WetterDienst

EAEC	European Atomic Energy Community
EaP	Eastern Partnership
EAPC	Euro-Atlantic Partnership Council
EADRCC	Euro-Atlantic Disaster Response Coordination Centre
EBRD	European Bank for Reconstruction and Development
ENPI	European Neighbourhood and Partnership Instrument
ERCC	EU Emergency Response Coordination Centre
ERRA	Electronic Regional Risk Atlas
EU	European Union
EUFD	EU Floods Directive
FAO	Food and Agriculture Organization
FHM	Flood Hazard Mapping
FRMP	Flood Risk Management Plan
GCM	Global Circulation Model
GCTU	General Confederation of Trade Unions
GDP	Gross Domestic Product
GFDRR	Global Facility for Disaster Risk
GHG	Greenhouse Gas
GIS	Geographic Information System
GRIP	Global Risk Identification Programme
GTZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
HNS	Host Nation Support
HNSG	Host Nation Support Guidelines
IAEA	International Atomic Energy Agency
IBRD	International Bank for Reconstruction and Development
ICAO	International Civil Aviation Organization
ICC	International Criminal Court
ICT	Information and Communication Technology
ID	Identity
IDA	International Development Association
IFAD	International Fund for Agricultural Development

IFC	International Finance Corporation
IFRCS	International Federation of the Red Cross and Red Crescent Societies
IGS	Institute of Geological Sciences of the National Academy of Sciences
IIAP	Institute for Informatics and Automation Problems of the National Academy of Sciences
ILO	International Labour Organization
IMF	International Monetary Fund
INSARAG	International Search and Rescue Advisory Group
IOC	International Olympic Committee
IOM	International Organization on Migration
IPCC	Intergovernmental Panel on Climate Change
IPU	Inter-Parliamentary Union
ISO	International Organization for Standardization
IT	Information Technology
ITSO	International Telecommunications Satellite Organisation
ITU	International Telecommunication Union
JICA	Japan International Cooperation Agency
JN	Journalist Network
JRC	Joint Research Centre
MIGA	Multilateral Investment Guarantee Agency
MNP	Ministry of Nature Protection
MoA	Ministry of Agriculture
MoD	Ministry of Defence
MoF	Ministry of Finance
MoH	Ministry of Health
MoU	Memorandum of Understanding
MoUD	Ministry of Urban Development
MoTC	Ministry of Transport and Communication
MTAES	Ministry of Territorial Administration and Emergency Situations
MS	Member State
MTEF	Medium-Term Expenditure Framework
NAG	National Advisory Group

NAM	Non-Aligned Movement
NAS IGS	National Academy of Sciences, Institute of Geological Science
NATO	North Atlantic Treaty Organization
NGI	Norwegian Geophysical Institute
NGO	Non-Governmental Organisation
NKE	Non-Key Expert
NSDI	National Spatial Data Infrastructure
NSSP	National Service for Seismic Protection
NUTS	Nomenclature of Territorial Units for Statistics
OAS	Organization of American States
OIF	Organisation Internationale de la Francophonie
OPCW	Organization for the Prohibition of Chemical Weapons
OSCE	Organization for Security and Co-operation in Europe
PFP	Partnership for Peace
PPP	Public-private partnership
PPRD East 2 Programme	EU-funded Programme for Prevention, Preparedness and Response to Natural and Man-made Disaster in EaP Countries
PuP	Public-public partnership
RA (or RoA)	Republic of Armenia
RBMP	River Basin Management Plan
RDC	Reception/Departure Centre
RS	Rescue Service
SAR	Search and Rescue
SCRPC	State Committee of the Real Property Cadastre
SCWE	State Committee of Water Economy
SDC	Swiss Agency for Development and Cooperation
SDI	Spatial Data Infrastructure
SNCO	State Non-Commercial Organisation
SoP (or SOP)	Standard Operating Procedure
SW	SoftWare
TTX	Table-Top Exercise

UN	United Nations
UNCTAD	UN Conference on Trade and Development
UNDP	UN Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNIDO	United Nations Industrial Development Organization
UNIFIL	United Nations Interim Force in Lebanon
UNISDR	UN International Strategy for Disaster Reduction
UN OCHA	UN Office for the Coordination of Humanitarian Affairs
UNWTO	UN World Tourism Organisation
UoM	Unit of Management
UPU	Universal Postal Union
US	United States
USAR	Urban Search and Rescue
USGS	United States Geological Survey
WCO	World Customs Organisation
WFD	Water Framework Directive
WFTU	World Federation of Trade Unions
WHO	World Health Organisation
WIPO	World intellectual property organization
WMO	World Meteorological Organisation
WRF	Weather Research and Forecasting
WRMA	Water Resources Management Agency
WTO	World trade organization

1 Executive Summary

Worldwide natural hazards and man-made disasters are on the rise, often leading to loss of lives, displacement of populations and destructions of costly infrastructures. These disasters can have dramatic negative effects on the economic growth of a country and can critically undermine the region's efforts for sustainable development. It is therefore of the upmost importance that risks of disasters are mitigated and that countries are better prepared to deal with them – individually and collectively.

The Eastern Partnership Flagship Initiative on Prevention, Preparedness and Response to Natural and Man-made Disasters (PPRD East) was launched in 2010 by the European Union to strengthen the countries' resilience, preparedness and response in addressing these challenges. With this regional initiative, the European Union provides the six Eastern Partnership countries (Armenia, Azerbaijan, Belarus, Georgia, Republic of Moldova and Ukraine) with dedicated assistance to enhance legislative, administrative and operational civil protection capacities as well as increase access to information on risk exposure and involvement of stakeholders.

The 5.5 million euro Phase 2 of the PPRD East Programme has commenced in December 2014 and the first year of its implementation has been dedicated to the civil protection capacity building, and to the assessment of the current status of the civil protection and disaster risk management in all six Partner Countries with an aim to assist and support Partner Countries in their approximation to EU acquis communautaire and EU good practise in the filed of civil protection and disaster risk management. The very initial mapping of Partner Countries needs, priorities and interests has been undertaken during the brief initial fact-finding missions undertaken to the Partner Countries in February 2015, to be followed with the detailed assessments done through the in-country missions, questionnaires and desktop analyses in the period April-August 2015.

The following presents the updated draft Country Profile based on information made available to the expert team. It includes an assessment of national follow-up on PPRD East Programme Phase 1 recommendations as well as of the following PPRD East 2 thematic topics:

1. Flood management and approximation to the EU Floods Directive
2. Disaster risk assessment
3. Disaster loss data collection and processing
4. ERRA
5. Inclusion of disaster risk reduction in public spending
6. Host Nation Support
7. EU approach to volunteerism in civil protection
8. Raising awareness about disasters

9. Data and information sharing and INSPIRE Directive

In addition, the civil protection profile, presented in the Electronic Civil Protection Operational Guidebook, developed within the PPRD East Programme Phase 1, has been updated. Each Chapter includes presentation of the legal and institutional framework, current status of practice, findings and recommendations, and the respective road maps with concrete suggestions on activities that should be implemented in the forthcoming period.

Draft Country Profile has been presented, discussed and validated by the National Advisory Group at and after the meeting organised on 17-19 November 2015 in Yerevan, Armenia. The Ministry of Territorial Administration and Emergency Situations of Armenia has requested PPRD East 2 team to ask EUD in Yerevan to submit the updated Country Profile through the Ministry of Foreign Affairs to all other respective/relevant Ministries within the Armenian Government for their information and convenience. The following thematic topics have been selected to be addressed within the PPRD East 2 Programme:

- Raising Awareness about Disasters, and
- Flood Risk Management, Disaster Risk Assessment, Disaster Loss Data complemented with ERRA.

For the other, in this document presented topics, the PPRD East 2 Programme will assist the Ministry of Territorial Administration and Emergency Situations of the Republic of Armenia and other national stakeholders in transforming here presented and accepted recommendations and road maps into bankable project proposals. The PPRD East 2 Programme will also assist all national stakeholders in searching for and finding the most suitable additional EU assistance instrument and/or the most suitable external bilateral and/or multilateral funding mechanism.

Basic country information validated on 18 July 2015 by Mr Hovhannes Yemishyan, Head of Population Protection and Elimination of Disaster Consequence Management Department of the Armenian Rescue Service, Ministry of the Territorial Administration and Emergency Situations and PPRD East 2 National Programme Coordinator.

2 Civil Protection profile (update of the Electronic Civil Protection Operational Guidebook)

2.1 Vulnerability to man-made and disasters caused by natural hazards

Armenia is vulnerable to floods, earthquakes, landslides, avalanches, mudslides, rock falls, strong winds, snow storms, frost and hail, as well as to disasters caused by technological hazards.

During 1997 – 2008, floods accounted for the major share of disaster events, followed by earthquake and drought. There were also 5 technological related disasters reported in the period 1992 - 1998.

However, the most devastating earthquake occurred in Armenia in 1988, causing 25,000 deaths, 15,000 injured, leaving 517,000 people homeless and prompting the evacuation of almost 200,000 people. Direct economic losses were estimated at 14.2 billion US dollars. On another hand, man-made hazards are various.

High seismic activity, mountainous relief and abrupt continental climate of the territory of Armenia pre-envisaged the types of natural hazards – strong earthquakes, landslides, collapses, floods, mudflow etc.

Districts prone to the mentioned disaster mainly lie within the borders of the populated area or the adjacent territories and make the considerable part of the territory of Armenia – almost 45%.

The disasters caused by natural hazards bring to human losses and annual damage caused to the population and its social-economical system is about of 10-12 billion AMD.

Despite a number of undertaken measures and works carried out, there still remain various sources of natural hazards in the territory of the Republic of Armenia, which are potential threats for the population, the objects of the social-economical system and which force to fulfil primary measures.

The existing tendency for the increase of disasters caused by natural hazards is conditioned by the following factors:

- by the active influence of the human activity on the environment,
- by the location and exploitation of industrial, economical and inhabited objects in the potentially dangerous areas, and
- by the insufficient technical conditions of anti-landslide, anti-mudslide and other hydro- technical constructions.

Volcanoes

There are more than 500 extinct volcanoes in the territory of the Republic of Armenia.

Landslides

Landslides are wide spread in the mountainous and foothill regions, almost in every marz (except the Ararat valley):

- more than 2.5 thousand potential landslides are revealed in the territory of Armenia
- the overall area at risk of potential landslides is almost 122sq.km, which is 4.1% of the overall surface of the country
- of the almost 960 communities in the country, 233 are affected with landslides: in more than 100 dwelling areas there is observed considerable activation of landslides because of which hundreds of residences, connection lines and other life provision objects are damaged
- 240 km (3.2%) from the 7400 km road net is damaged by 280 landslides
- 4.8 (0.5%) of the 870km railway network are damaged by 10 landslides and so on.

According to the inventory data, the direct damage done by the landslide phenomena to the social-economical constructions in the country is almost 43 million USD, and the potential damage is almost 54 million USD (4.0-4.5 billion AMD). The very important research on the landslide hazard assessment, mapping and design of measures for risk reduction was implemented by JICA team in Armenia.

A number of programmes and projects were planned to prevent or mitigate the effects of landslides, but the implementation suffered from lack of funding and the non-compliance with building standards.

Stone falls

In the recent years they are widely spread and cover more than 16.683 hectare surface. They are a serious threat for the population and territories and do tangible harms to the territorial subdivisions.

Flood and mudflow

More than 30% of the territory of Armenia is flood prone and the annual damage to the population and its social-economical system is up to 2.0 billion AMD.

Spring flooding and inundations in the territory of Armenia begin from the second half of March and continue until June, sometimes until July. The average duration of inundations is 80-120 days, the maximum 150 days, and the minimum 60 days.

The risk of **technological disasters** is also significant, due to the presence of 24 enterprises that produce hazardous chemicals and 1,500 enterprises are at risk of explosion or catching fire.

There is also a potential radiation hazard related to the nuclear plant at Metsamor. The IAEA assessments showed that Armenian nuclear power plant is safe enough - it is highly earthquake resistant and located on non-seismic active zone.

2.2 General Country Information

FLAG

The flag of the Republic of Armenia is tricolour made of equal horizontal stripes of red, blue and orange (from top to bottom).
The red colour symbolizes the Armenian highland and the constant fight of the Armenian people for longevity, the Christian religion and the independence and freedom of Armenia. The blue colour symbolizes the will of the Armenian people to live peacefully under a blue sky. The orange colour symbolizes the creative talent and diligence of the Armenian people.

BASIC COUNTRY INFORMATION

Head of State	President Serzh SARGSIAN (since 9 April 2008)
Head of Government	Prime Minister Hovik ABRAHAMYAN (since 13 April 2014)
Capital	Yerevan
Population	2,974,184 (July 2013 est.)
Area	29,743 sq km; (land: 28,203 sq km, water: 1,540 sq km)
GDP / Capita (PPP)	US$ 5,600 (2012 est.)
Membership of international organizations	ADB, BSEC, CD, CE, CIS, CSTO, EAEC (observer), EAPC, EBRD, FAO, GCTU, IAEA, IBRD, ICAO, ICC (NGOs), IDA, IFAD, IFC, IFRCS, ILO, IMF, Interpol, IOC, IOM, IPU, ISO, ITSO, ITU, MIGA, NAM (observer), OAS (observer), OIF, OPCW, OSCE, PFP, UN, UNCTAD, UNESCO, UNIDO, UNIFIL, UNWTO, UPU, WCO, WFTU (NGOs), WHO, WIPO, WMO, WTO
Ethnic groups	Armenian 97.9%, Yezidi (Kurd) 1.3%, Russian 0.5%, other 0.3% (2001 census)
Religions	Armenian Apostolic 94.7%, other Christian 4%, Yezidi (monotheist with elements of nature worship) 1.3%
Climate	Highland continental; hot summers; cold winters
Location	South-western Asia, between Georgia (to the North), Turkey (to the west), Iran (to the South), and Azerbaijan (to the East)
Land Boundaries	In total: 1,254 km; Bordering countries: Azerbaijan-proper 566 km, Azerbaijan-Naxcivan exclave 221 km, Georgia 164 km, Iran 35 km, Turkey 268 km
Terrain	Armenian Highland with mountains; little forest land; fast flowing rivers; good soil in Aras River valley, landlocked in the Lesser Caucasus Mountains; Sevana

Lich (Lake Sevan) is the largest lake in this mountain

The greatest extend from North-West to South-East comprises 360 km, from West to East: 200 km,

Earth lowest point:
The underflow region of Debed river: 375 m

Mountains, plateaux:
36.4 % (of the RA territory),

The highest elevation:
The peak of Mount Aragats: 4090 m

High mountaintops:
Kaputjugh: 3906 m
Azhdahak: 3598 m
Spitakasar: 3555 m
Vardenis: 3522 m,

Water reserves:
Annual: 8.5 bln.m3, of which

6.54 bln.m3 is surface water flow

Longest rivers (within the RA territory)`
Araks: 158 km
Akhuryan: 186 km
Vorotan: 111 km
Debed: 154 km
Hrazdan: 141 km
Aghstev: 81 km,

Lakes:
Sevan (as of 31.12.2010):

Surface: 1270.8 km2, (Lake Sevan is fed by 28 rivers and streams, of which only Hrazdan river flows out)

the altitude above sea level: 1899.90 m

Arpi: surface: 22.0 km2, the altitude above sea level: 2021 m

Sev: surface: 2.0 km2, the altitude above sea level: 2666 m

Akna: surface: 0.80 km2, the altitude above sea level: 3032 m

Land use	Arable land: 16.78%, permanent crops: 2.01%, other: 81.21% (2005)
National economy	Since the Soviet era, Armenia has switched to small-scale agriculture. The economy began to recover in 2010 with 2.1% growth, and picked up to 4.6% growth in 2011, before slowing to 3.8% in 2012. Since August 2011, Armenia experienced a sharp 15 per cent currency depreciation and an increase in the unemployment rate. Armenia's geographic isolation, a narrow export base, and pervasive monopolies in important business sectors have made it particularly vulnerable to the sharp deterioration in the global economy and the economic downturn in Russia. Armenia has only two open trade borders - Iran and Georgia - because its borders with Azerbaijan and Turkey have been closed since 1991 and 1993, respectively, as a result of Nagorno-Karabakh on-going conflict with Azerbaijan. Armenia is particularly dependent on Russian commercial and governmental support and most key Armenian infrastructure is Russian-owned and/or managed, especially in the energy sector. Natural gas is primarily imported from Russia but construction of a pipeline to deliver natural gas from Iran to Armenia was completed in December 2008, and gas deliveries expanded after the April 2010 completion of the Yerevan Thermal Power Plant. The government made some improvements in tax and customs administration in recent years, but anti-corruption measures have been ineffective and the economic downturn has led to a sharp drop in tax revenue and forced the government to accept large loan packages from Russia, the IMF, and other international financial institutions. Amendments to tax legislation, including the introduction of the first ever "luxury tax" in 2011, aim to increase the ratio of budget revenues to GDP, which still remains at low levels. Armenia will need to pursue additional economic reforms and to strengthen the rule of law in order to regain economic growth and improve economic competitiveness and employment opportunities, especially given its economic isolation from two of its nearest neighbours, Turkey and Azerbaijan. In 2009, senior Armenian leaders began pursuing rapprochement with Turkey, aiming to secure an opening of the border, but Turkey has not yet ratified the Protocols normalizing relations between the two countries. *(Source: https://www.cia.gov/library/publications/the-world-factbook/geos/am.html)*

FORM OF GOVERNMENT

System description	The Republic of Armenia is a sovereign, democratic, social state governed by rule of law. In the Republic of Armenia the power belongs to the people. The people exercise their power through free elections, referenda, as well as through state and local self-governing bodies and public officials as provided by the Constitution. The state power is exercised in conformity with the Constitution and the laws based on the principle of the separation and balance of the legislative,

executive and judicial powers. The President of the Republic of Armenia shall be the head of the state. The President of the Republic shall strive to uphold the Constitution and to ensure the regular functioning of the legislative, executive and judicial powers. The President of the Republic shall be the guarantor of the independence, territorial integrity and security of the Republic of Armenia. The President of the Republic shall be elected by the citizens of the Republic of Armenia for a five year term of office.

Administrative divisions and structure

The administrative-territorial units of the Republic of Armenia are the provinces (marzes) and the districts. Provinces include urban and rural districts. The provinces are governed by regional governments. The districts have local self-governments. The government appoints the governors in the provinces, who implement the government's regional policy and coordinate the regional activities of the republican executive bodies. The Republic of Armenia is divided into 10 provinces and the capital city of Yerevan. The city of Yerevan has the status of a community. The Mayor of Yerevan is elected by a vote of "Avagani".

The Legislative Power

The single-chambered National Assembly is the supreme legislative authority of the Republic of Armenia. The National Assembly consists of one hundred and thirty-one deputies. The National Assembly is elected through general elections for a term of five years. Parliamentary elections were last held in 2012.
Executive power is exercised by RA Government. The Government is composed of Prime Minister and Ministers. Based on consultations held with National Assembly factions, the President of Republic appoints the person nominated by the parliamentary majority to be Prime Minister or - where impossible - the person nominated by the largest number of NA membership. The President of the Republic appoints and discharges members of government on Prime Minister's proposal.

(Source: International CEP Handbook 2009: Civil Emergency Planning in the NATO/EAPC Countries.
Available on the Swedish Civil Contingencies Agency's website, www.msbmyndigheten.se).

NATIONAL CIVIL PROTECTION SYSTEM, MANDATE AND ORGANIZATION

Legal framework

Civil protection activities and civil defence are regulated by a number of laws and other pieces of legislation in the Republic of Armenia. Civil protection in the republic is based on the following legislation:

- The Law on Civil Protection in Emergency Situations, adopted in December 1998,
- The Law on Fire Security, adopted in April 2001,

- The Law on Civil Defence, adopted in March 2002,
- The Law on Seismic Protection, adopted in June 2002,
- The Law on Rescue Forces and the Status of Rescuers, adopted in May 2004,
- The Law on the Rescue Service, adopted in August 2005,
- The Law on Local Self-Governance, adopted in May 2002.

Besides the above mentioned legislation, civil protection activities in emergency situations are regulated by decisions made by the Government of the Republic of Armenia, by the Prime Minister Decrees and the RA TAES Minister's orders.

(Source: International CEP Handbook 2009: Civil Emergency Planning in the NATO/EAPC Countries.
Available on the Swedish Civil Contingencies Agency's website, www.msbmyndigheten.se).

Civil protection/civil defence/civil emergency planning: System overview, organization and structure

The Republican Commission supervises the activities regarding civil protection and elimination of disaster consequences during emergencies. It is governed by the RA Prime Minister and his deputies are the TAES Minister, members, other RA ministers, heads of state government bodies and heads of regional governments. MTAES – (founded in 2014) is the republican body of state governing The MTAES includes the following sub-divisions:

1. Rescue Service
2. State Reserve Agency – state non-commercial organization;
3. Service of Seismic Protection – agency;
4. National Centre of Technical Security – state non-commercial organization;
5. Armenian State Hydro-meteorological and Monitoring Service – state non-commercial organization;
6. The inspection of the State fire and the technical security;
7. Service of the Active Influence to Atmospheric Processes;
8. Crises Management State Academy;
9. Special Mountain Rescue Service - CJSC
10. State archive
11. Migration State Agency

Within the MTAES the Rescue Service coordinates and supervises population protection activities in the field of civil protection.

Civil protection/civil defence/civil emergency planning objectives and tasks

The MTAES is responsible for the current state of the country's preparedness, and provides prospective development policy in the field of civil protection. The objectives of the MTAES are to:

- establish and implement governmental policy in the civil protection and population protection fields;
- coordinate emergency response, rescue, and fire fighting operations, and prioritized and urgent infrastructure reconstruction activities,
- organize and implement governing activities in the fields of receiving and briefing of information, decision-making aimed at resolving problems in the

field of civil protection and population protection in the event of emergencies;
- implement activities requiring special allowance and supervision in established legislation within the framework of the ministry;
- develop the state regulating police for population evacuation activities in the event of emergencies and in the civil protection field, as well as coordinate activities directed to its implementation;
- earmark and provide state storage reserves;
- Implement activities directed to seismic risk reduction;
- ensure the implementation of forecasting, studying, and special observations of hydro-meteorological phenomena;
- ensure the maintenance of the technical security centre based on international experience and scientific-technical progress and achievements;
- coordinate activities for emergency humanitarian response;
- coordinate activities of state governing and local self-governing bodies, organizations in the field of civil protection and population protection as well as the activities of forces implementing international rescue activities in the territory of the Republic of Armenia;
- coordinate the organization of the population training process in the field of civil protection and population protection during emergencies;
- organize and ensure the awareness of state bodies and the population regarding civil protection and population protection issues.

The RA MTAES Urban Search and Rescue (Armenian USAR) Team passed the external classification exercise of the United Nations International Search and Rescue Advisory Group (INSARAG)

On 4 September 2015 the Armenian USAR Team was awarded a certificate as a medium INSARAG-qualified external/international team.

They also carry on implementing joint activities with the Swiss Agency for Development and Cooperation (SDC): USAR teams have been established and refurnished in Yerevan, Shirak, Syunik, Tavush and Lori regions within the Program on the Establishment of Regional Rapid Response Teams. Together with the SDC, the USAR teams of Yerevan, Shirak and Syunik have undergone INSARAG's inner classification exercises (after which Yerevan's team passed the INSARAG's external/international classification exercises, see the first paragraph) .

At present they carry out activities in order that the USAR teams of Tavush and Lori could also pass the internal INSARAG classification exercises.

Civil protection/civil defence/civil emergency

Each Ministry or department involved in the system of civil protection, implements the civil protection policy in its own field. The corresponding

planning organizational structure

subdivisions of emergency and civil protection implement the policy in their ministries and departmental administrations. Each territorial body involved in the system of civil protection implements the territorial policy of civil protection from disasters. Emergency management and civil protection subdivisions work in all provinces and in the city of Yerevan.

There are three main types of rescue services in the system for civil protection in emergencies: governmental, public, and departmental.

Governmental rescue services are considered subdivisions of the RS of the MTAES. In the event of disaster, the activities of governmental, department administrational and public services are directly governed by the RS of the MTAES.

The Crisis Management State Academy under the RA MTAES organizes and conducts population trainings on withstanding emergency situations and civil protection. The main objectives of the RA MTAES Crisis Management State Academy are as follows:

a) preparing high-quality specialists through graduate and post-graduate programs in civil defence and civil protection in the event of emergency situations,

b) personnel development, requalification and advance training in the main issues of civil defence and civil protection in emergency situations for the RA state government and local self-government authorities, organisations (regardless of the organisational and statutory forms), executives, specialists, teachers and professors teaching the main issues in the RA education system,

c) implementation of a two-year education program based on the junior officers in the Armenian Rescue Services of the RA MTAES,

d) development and coordination of the implementation of the policy on the education of emergency situation issues and civil protection in the RA education system,

e) organisation and implementation of population trainings on withstanding emergency situations and civil protection,

f) carrying out research and development, as well academic activities in the areas of civil defence and civil protection during emergency situations

g) creation and publication of educational and scientific-technical literature and spread of knowledge.

It prepares specialists in civil protection and civil defence during emergency situations: crisis management, rescue operations, civil defence, fire protection, emergency security operations, operation and maintenance of transport, special fire-fighting and rescue machinery. It also implements requalification and vocational education, as well as post-graduate and additional scientific educational programmes.

International co-operation related to disasters is implemented by the MTAES and the RS.

Among the separate divisions and state agencies, the Rescue Service (RS) is a state body that carries out prevention, reduction and liquidation of possible

consequences of emergency situations, functions of civil defence, protection of population and economic objects (territories) in emergency situations and martial law (at war) as well as rescue, accident-rescue, urgent accident-reconstruction, fire fighting and other activities. Altogether 3700 persons work now in RS. Since 2008 RS is working under jurisdiction of the MES, which has become the MTAES as a result of merging of the two Ministries - Ministry of Territorial Administration and the Ministry of Emergency Situations.

(Source: International CEP Handbook 2009: Civil Emergency Planning in the NATO/EAPC Countries. Available on the Swedish Civil Contingencies Agency's website, www.msbmyndigheten.se).

Civil-military cooperation

Republic of Armenia declares and exercises principles of civilian control over military. The National Security Strategy, Military Doctrine and legislation related to the Ministry of Defence (MOD) and military formations recognizes emergencies as the threat to national security. Those documents oblige MOD to support civilian authorities in emergencies.
The MTAES cooperates with military structures according to special plans. These plans are mutually agreed upon and jointly accepted and include mutually agreed activities for military structures in the field of civil protection. The training of skills in military structures in the field of population protection during emergencies as well as any necessary corrections to jointly accepted plans are implemented through training exercises.

(Source: Arm strategic defence review, http://www.mil.am/1306158572; National Security Strategy of the Republic of Armenia, http://www.mil.am/1297157753; The Military Doctrine of the Republic of Armenia, http://www.mil.am/Est-tristique-auctor-mus-pulvinar-parturient-ac-arcu-et--sed-montes-turpis-)

External stakeholders

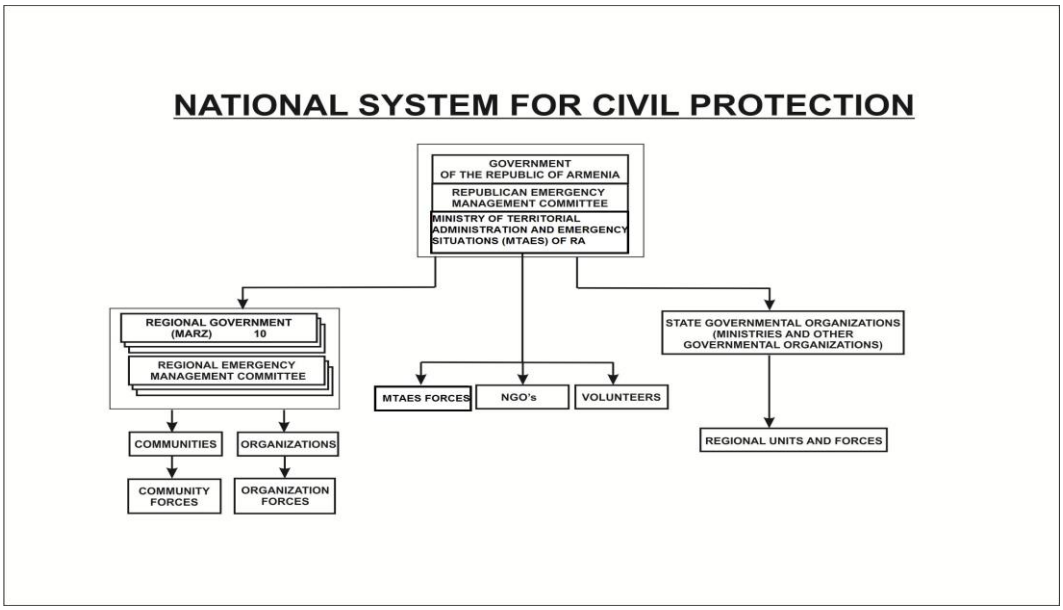
UNDP, UN OCHA, European Union, European Union Emergency Response Coordination Centre (ERCC), International Search and Rescue Advisory Group (INSARAG), NATO Euro-Atlantic Disaster Response Coordination Centre (EADRCC), Civil Military Emergency Preparedness Program (CMEP), BSEC, UNISDR, World Bank, NATO Civil Emergency Planning Committee (CEPC) and IFRC.

Internal stakeholders

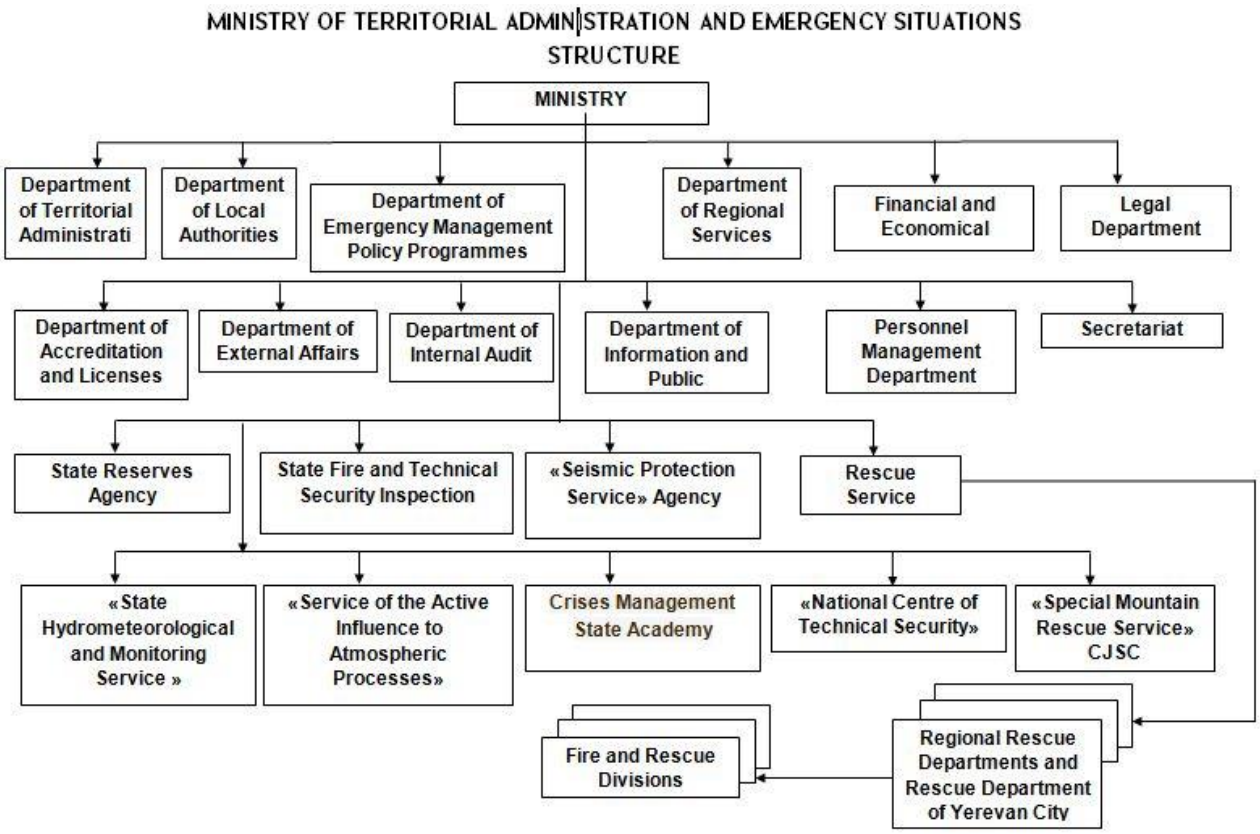
Private sector: All organizations are subject of Civil Protection System
Volunteers: Volunteers can be involved into activities related to elimination consequences of emergencies
NGOs: N/A

(Source: The Law of the Republic of Armenia on Armenian Rescue Service, The Law of the Republic of Armenia on Rescue Forces and Status of Rescuers, The Law of the Republic of Armenia on Population Protection in Emergency Situations, The Law of the Republic of Armenia on Civil Defence, The Law of the Republic of Armenia on Fire Security, The Law of the Republic of Armenia on Seismic Protection, The Law of the Republic of Armenia on Protection, The Law of the Republic of Armenia Legal Regime of Martial Law)

CIVIL PROTECTION



Available Human and Material Resources



Early warning and communication	Early warning systems can be very effective in case of weather related risks but in a case of seismic risks they are very far to be effective. Early warning system can support the prevention of, preparedness for and timely response to manmade and disasters caused by natural hazards, but they are only effective if they are able to provide alert on time to implement CP prevention, mitigation and preparedness activities and save people. Communication systems are inadequate and the level of awareness for evacuation is low. Procedures to exchange relevant information during hazard events and disasters are in place, but exchange is difficult because of communication flow.
Early warning systems towards professionals	The system of the warning and notifying of population is developed for emergency situations. It is connected with the estimation of risk in case of devastating earthquakes (the natural phenomenon), as well as at environmental contamination at failure on chemically dangerous objects and emission of radioactive substances in atmosphere (technogenic process), and also at possible break of pressure head hydraulic engineering constructions.
Early warning systems towards the population	The centralized system of early warning of population does not function.
Public information system	Public information does exist. Their activity is depending on scale of emergency.
Operative information	Operative information is mainly flowing through communication systems of the Ministry of Territorial Administration and Emergency Situations
Emergency numbers	The 911 service for provision of urgent and coordinated help to people was put into operation in 2012. (Within just one year the number of phone calls exceeded 1,300,000, which is more than the number of phone calls to all other operational services combined.) Other emergency numbers: Rescue 911 Police 102 Ambulance 103 Gas lines 104
Bilateral agreements	Memorandum of Understanding on strengthening cooperation in disaster management and response between the Ministry of Territorial Administration and Emergency Situations of Armenia and the Ministry of Interior of Montenegro, signed in June 2011 (facilitated by UNDP in Armenia). Cooperation agreement in the sphere of industrial accidents, natural

disaster prevention and consequences elimination, concluded between RA Government and Russian Federation Government on 17 August 1994.

Agreement on the control of dangerous and other waste trans boundary transportation, concluded in Moscow on 12 April 12 1996.

Cooperation agreement on the prevention and consequences elimination in case of natural and man-made disaster and emergency situations was signed between the Government of the Republic of Armenia and Government of Georgia on 9 July 1998.

A document on the assistance of disaster preparedness of national structure between UN Armenian office of development project, USAID and Rescue Service of the Ministry of Territorial Administration of the Republic of Armenia, signed, on 10 April 2003.

Agreement between the Government of RA and the Government of Swiss Confederation about technical and financial cooperation on supporting the RA response system in emergency situations in Armenia, 2010.

Memorandum of understanding between MES of RA and UNICEF, 2010.

Memorandum of understanding between the MES of RA Rescue Service and the fire department of federal region of Federal Republic of Brazil, 2010.

Memorandum of understanding about cooperation between MES of RA and Polish Republic «Ecotech Polska» company, 2010.

Agreement between MES of RA and USA defence department in the field of prevention of technologies used for creation of biological weapons, pathogens and expertise dissemination, 2010.

Memorandum of understanding on provision of operative information and implementation of general means of telecommunication by the UN mission in RA and MES of RA, 2011.

Agreement between UN disaster management team and MES of RA on disaster management, preparedness and response activities, 2011.

Memorandum of understanding between the Swedish emergency situations civil planning agency and MES of RA in the field of emergency situations prevention and response, 2011.

Agreement of cooperation between MES of RA and MES of Belarus in the field of emergency situations prevention and elimination, 2011.

Memorandum of understanding between the US geological service of USA internal affairs department and State Service of Seismic protection of MES of RA, 2011.

Memorandum of understanding between MES of RA and OSCE, 2011.

Memorandum of understanding between the State Service of Seismic protection of MES of RA and the department of environment monitoring and analysis of the French commission of atomic and alternative energy, 2011.

Memorandum of understanding between MES of RA and Armenian Red Cross on cooperation and mutual assistance in emergency situations in

the field of population protection, 2012.
Agreement between MES of RA and SDC Agency on providing advisory support to the Crisis management national centre of MES of RA, 2012.
Agreement between the Government of RA and the Government of Turkmenistan on cooperation in the field of seismic protection, 2012.
Joint minutes between National Security councils of RA and RF on cooperation between State Seismic protection Service of MES of RA and Geophysical service of Science Academy of RF, 2013.
Agreement between MES of RA and Swiss Agency for development and cooperation about strengthening the Armenian decentralized rescue system, 2013.
Memorandum of understanding between MES of RA and the Civil affairs Ministry of China, 2013.
Memorandum of intentions between MES of RA and the Ministry of Internal affairs of Czech Republic on cooperation in the field of disaster prevention and elimination, fire protection and population protection, 2014.
Minutes of Discussions agreed between the MES of RA and JICA about landslide disasters management, 2014.
Letter of intentions between the Ministry of Internal affairs of the Republic of France and MES of RA about the cooperation in the field of population protection from natural and man-made disasters, 2014
Agreement between the Government of RA and the Government of RF about establishing Russian-Armenian humanitarian response centre, 2015.
Letter of intentions between the Rescue Service of MTAES of RA and the State Fire Service of the Republic of Poland, 2015.

Multilateral agreements, MOUs, Protocols of cooperation, etc.

Security agreement between RA Government and Euro-Atlantic Treaty Organization concluded in Brussels on 13 January 1995.
Cooperation agreement among Governments of the participant countries of Black Sea Economic Cooperation on the prevention of natural and man-made disaster and elimination of its consequences was signed in Sochi on 15 April 1998.
Memorandum of understanding between the Ministry of Science and Education, the Ministry od Emergency Situations, UNICEF Armenian office, Oxfam (Great Britain) Armenian branch and Armenian Red Cross, 2010.
Memorandum of Understanding between MES of RA, MES of RA, ARNAP foundation, UNICEF Armenian office, Oxfam, Armenian Red Cross and Save the Children on Disaster risk reduction in Armenia, 2012
Treaty on Eurasian Economic Union between EEU member states and the Republic of Armenia, 2014.
(Source: http://www.ema.am/index.php/en/international-cooperation.html)

INTERNATIONAL ASSISTANCE

National arrangements on how to receive and deliver international assistance

Legal framework applicable for incoming international assistance: Bilateral agreements in force, provisions of international agreements / guidelines affecting host nation support, such as: Tampere Convention, the 2006 Kyoto Convention on customs procedures and the NATO MoU on vital cross-border transport. Major pieces of applicable national legislation include: the Emergency Action Plan of governmental organizations, the Government Decree No. 66-N of 2003 on the goods provided as humanitarian aid and the Government Decree No. 919 of 10 June 2011 on the population protection plan in case of a strong earthquake.

The receipt and delivery of humanitarian aid is performed in the following way:

- The issues relevant to the provision of humanitarian aid from abroad are regulated by the Ministry of foreign affairs of RA, by the Deputy Chair of the republican Committee of emergency situations by the assignment of the minister of emergency situations, basing on the recommendations of the ministers of economy and healthcare.
- Special groups receiving the humanitarian aid are formed and they are located on border crossing points and airports.
- The group, which helps the Committee, consists of 25 persons, with a twenty-four-hour working schedule. All the transportation means are provided by the republican Committee of emergency situations, a special pass, sealed and signed by the representative of the authorized body, is processed.
- The load is accompanied by RA Police and the forces of the relevant structures of the authorized bodies.
- The humanitarian aid in the disaster zone is handed in a centralized way to the humanitarian aid delivery groups, adjunct to the regional and municipal committees of emergency situations, which are formed in marz administrations. These groups are controlled by the head of the authorized body. According to special lists, these committees deliver the aid to the population.
- The international aid is registered by the authorized body.

The order of the arrival of rescue forces, performance of rescue operations and organization of cooperation is the following:

- During the rescue operations the cooperation is organized with the aim of purposeful use of quick reaction forces in emergency situations and clarity of interactions between these forces. Interactions are organized according to the place and time.

- The engagement of international forces is performed upon the request, which is submitted, to the command staff of the arrived international forces by the RA republican Committee of emergency situations. The establishment of the international forces operations command staff as well as the establishment of reception points on the border crossing points and in airports is performed by international expert groups. If the expert groups have not yet arrived, these operations are performed by the first arrived teams.
- The operations of the international rescue groups are coordinated by the international expert staff, which submit reports to the RA republican Committee of emergency situations.

The direct management of international forces in working stations is performed by the head of the working station.

The Ministry of Territorial Administration and Emergency Situations and the Ministry of Foreign Affairs are entitled to request and receive international disaster relief assistance.

Regulations and other particular issues affecting the transport of international assistance

	Road transport of relief / international teams:
Entry into the territory	Border crossing points: **1) BAGRATASHEN check point – located North-East part of Armenia, Tavush region;** **2) BAVRA check point – located North-West part of Armenia, Tavush region;** **3) GOGAVAN check point – located North-central part of Armenia** **5) Meghri check point – located South part of Armenia** Hazardous goods and restricted equipment: **N/A** Animal health restrictions (e.g. Search and rescue dogs): **Documents of SAR dogs shall be provided upon acceptance of the offer. All veterinary inspections are then arranged to be carried out at border crossing points.** Providing Visa at the border crossing point for relief personnel: **Police provides to issue Visas at the border**
Circulation in the territory	Daylight driving restrictions: **No restrictions** Night driving restrictions: **No restrictions** Weekend driving bans: **No bans** Season driving bans: **No bans** Technical restrictions of vehicles sizes (height, width and weight) and licenses for vehicles. Roads type and height restrictions (for tunnels or cities): **N/A**

	Road/motorway tolls: **No tolls** Restrictions as regards alcohol consumption while driving: **Alcohol consumption is not allowed while driving** Restrictions on driving time (for drivers): **No restrictions** Possession of International driving license: **Required** Use of rotating lights: **no rotating lights** Convoy attendance: **will be provided by RA Police in case of need**
Facilitation of road transport operations	Civil Protection Contact Point: **RA Police** Competent authority concerning request escorts for civil protection convoys: **MTAES** Competent authority concerning request for exceptions for urgent relief operations: **Ministry of Territorial Administration and Emergency Situations of the RA**
	Aerial transport of relief / international teams:
Entry into the territory	International airports (e.g. availability/operational program, capacity/take-off and landing lane length, taxes for parking and handling services, availability of resources for refuelling): **ZVARTNOTS International airport, Gyumri International airport** Hazardous goods and restricted equipment: **N/A** Animal health restrictions (e.g. Search and rescue dogs): **Documents of SAR dogs shall be provided upon acceptance of the offer. All veterinary inspections are then arranged to be carried out at border crossing points.** Providing Visa at the airport for relief personnel: **Police provides to issue Visas at the border**
Facilitation of Customs procedures	Exempt relief goods and equipment from all custom duties, taxes, tariffs or any governmental fees: **yes, according to a separate government decree** Exempt relief goods and equipment from all export, transit and import restrictions: **yes, according to a separate government decree** Simplify and minimize documentation requirements for export, transit and import: **yes** Waive or reduce inspection requirements: **yes** Availability of customs outside of business hours: **yes**
Facilitation of aerial transport operations	Civil Protection Contact Point: **Artyom Movsesyan, Head of the General Department of the Civil Aviation, Yerevan, 0042 Zvartnots tel.(37410)59-30-03,28-20-66 Fax (37410) 28-53-45, e-mail: artiom.movsesyan@aviation.am** Competent authority concerning request for rapid grant of landing and over flight permission for relief flights: **General Department of Civil Aviation of Republic of Armenia**

	Competent authority concerning request for exceptions for urgent relief operations: **General Department of Civil Aviation of Republic of Armenia**

Regulations and other particular issues affecting the liability of relief personnel

Recognition of relevant professional qualifications of relief personnel (medical personnel, rescuers, engineers, etc.) during the international assistance operation	Yes / No / Other procedure: **Yes, with no certification procedure** Legal basis: **N/A**
Recognition of all necessary certificates and qualifications needed for the conduct of their work, such as driver's license	Yes / No / Other procedure: **yes** Legal basis: **N/A**
Any liability for physical injury, adverse health effects or death of any person / property damage on your territory produced with no intention by the relief personnel of the Sending Nation during the relief operations, shall be assumed by:	Requesting Nation: **yes** or Sending Nation: **No** or Individual worker: **No** Legal basis: **N/A**

Regulations and other particular issues regarding the Host Nation Support

Concept implemented into the relevant national legislation in force	Yes / No / Other procedure: **yes** Legal basis: **Government decree N919 of 10 June 2011 "Population protection plan in case of a strong earthquake",** **The Republic of Armenia AL265 of 2 December 1998 law on "Population Protection in Emergency Situations"**

Consist in providing support to the international relief personnel with the following

Entry	(visa, work permit, waiver of taxation on roads, provision of escort, security, clearing of the roads, etc.) Yes / No / Which of them: **yes** Please provide a brief description of the procedure in place: **N/A**
Communication	(providing to the international relief teams in due time the necessary access to frequencies, bandwidth and satellite use) Yes / No / Which of them: **yes** Please provide a brief description of the procedure in place: **N/A**

Command and Control	(liaison officers designated for cooperation with the incoming international teams) Yes / No: **yes** Please provide a brief description of the procedure in place: **In case of disaster Ministry of Territorial Administration and Emergency Situations will create RDC (HNS) teams. Liaison officer of the RDC (HNS) Teams will provide all kind of assistance for incoming international rescue teams.**
Coordination	(existence of procedures for other relevant Ministries involvement in relief reception operations, such as Telecommunication, Transport, Health, Police Services, etc.) Yes / No: **yes** **Yes, the RA MTAES organizes the aforementioned groups. The groups' structure and functions are established by the RA Government Decision on approving the newly developed plan for organizing the RA civil protection in the event of severe earthquakes. The MTAES has also developed a decision on approving the procedure of the RA Civil Aviation's airplanes' actions in emergencies and the procedure of cooperation with the RA state bodies, where the main provisions and functions of HNS system are also described, even RDC in all border-crossing point. It also includes airports and Armenia's HNS functions when international emergency aid is provided to a third country in the region by using the RA territory and airports.**
Security	(appropriate measures in place to keep safe the relief personnel, locations, goods and equipment related to the international assistance) Yes / No / Which of them: **yes** Please provide a brief description of the procedure in place: **Security is assumed both by the host and sending nation. Incoming relief teams shall ensure safety on site of operations.**
Operations area	(base camp provision with adequate conditions for accommodation, food, water, hygiene facilities, storage, electricity, communication technology, vehicles parking, transport, fuel supply, etc.) Yes / No / Which of them: **yes** Please provide a brief description of the procedure in place: **Armenia will accept only self-sufficient disaster relief teams (for 7-10 days). In case of need, however, lodging, water, food, fuel and electricity can be provided. It is unclear whether for free of charge or against payment. Distribution channels of all the above services and commodities are arranged by the Ministry of Emergency Situation, local management authorities and private companies.**
Language	(provision of interpreters for the international teams) Yes / No: **yes**

Please provide a brief description of the procedure in place: **Administrative / officer support, interpretation and eventually technical / ICT support as well as inland transport are available.**

LIST OF RELEVANT CONTACTS

Civil Protection	Postal address: **109/8 A. Mikoyan Str., 4th Block of Davitashen, 0054 Yerevan, Republic of Armenia** Telephone number: **(+374 10) 31 78 43, (+374 10) 31 77 20, (+374 60) 44-02-30** Fax number: **+374 (10) 36-02-87** E-mail address: **sergey.azaryan@mes.am** Person of Contact (rank, name, position, organization/structure): **Director of Rescue Service of MTAES, r/s major-general Sergey Azaryan, (+374 10) 31 78 01,** **Population protection and disaster consequences elimination management department of Rescue Service of MTAES, r/s colonel Hovhannes Yemishyan(+374 10) 31 78 15** E-mail address: **hovhannes.yemishyan@mes.am**
Emergency operations	Postal address: **109/8 A. Mikoyan Str., 4th Block of Davitashen, 0054 Yerevan, Republic of Armenia** Telephone number: **+374 (10) 36-02-97, +374 (10) 36-02-81, +374 (60) 44-03-35** Fax number: **+374 (10) 36-02-87** E-mail address: **cmc@mes.am** Person of Contact (rank, name, position, organization/structure): **Head of Crisis Management National Centre of MTAES, r/s colonel Hovhannes Khangeldyan**
International cooperation	Postal address: **109/8 A. Mikoyan Str., 4th Block of Davitashen, 0054 Yerevan, Republic of Armenia** Telephone number: **(010) 31 77 61, (010) 31 77 80** Fax number: **+374 (10) 36-02-87** E-mail address: **gevorgyan.mariam@mes.am** Person of Contact (rank, name, position, organization/structure): **Department of Foreign Relations, Head: Mariam Gevorgyan**
International assistance	Postal address: **Ministry of Foreign Affairs Government House #2, Republic Square, Yerevan 0010, Republic of Armenia** Telephone number: **+374 60 620000** Fax number: **+374 60 620062** E-mail address: **info@mfa.am** Person of Contact (rank, name, position, organization/structure): **Edward Nalbandian**

Minister of Foreign Affairs

Responder

PPRD East 2 National Programme Coordinator in ARMENIA - **Mr Hovhannes Yemishyan, Rescue Services Colonel,** Head of Department of Population Protection and management of Disaster Consequences Elimination, Ministry of Territorial Administration and Emergency Situations
+37410317815, +37491201966,
hovhannes.yemishyan@mes.am

3 Progress made in the adoption of recommendations provided within the PPRD East Programme Phase 1

Key Assessors	
PPRD East 2 Experts	Davide Miozzo
Country Thematic Focal Point	N/A
Chapter validated by	National Advisory Group

3.1 Legal framework

PPRD EAST 1 recommendations	Action taken
Armenia should be more active in enhancing the approximation to the acquis communautaire. Specific attention should be paid to the SEVESO Directive in the wake of what has been already developed within the PPRD East Programme.	Armenia has greatly worked on its civil protection system since the end of PPRD East 1 Programme. The management system has been modified and there has been an improvement in the overall efficiency (see legal recommendation n.2). Some projects implemented in Armenian territory addressed, although not directly, the implementation of components of EU acquis[1] with particular reference to Chapter 22 (Environment). It must be however stated that so far the initiatives promoted are fragmentary and don't cover the whole o country. The pace at which things are evolving in the Republic of Armenia depicts however a very promising future for the field of civil protection. Furthermore, the recent merger between the Ministry of Territorial Administration and the Ministry of Emergency Situations (completed in late 2014), the development of crisis centres at national and regional level is going in the direction of

[1] *Activities to be acknowledged that address chapter 22 of the Acquis (Environment) and in particular risk management are: German Technical Cooperation Agency (GTZ) has implemented the "Flooding, Mudflow and Landslide Risk assessment in Tavush and Lori Regions of Armenia" developing multi hazard risk profiles of many communities; River Basin Management Plans initiatives (read chapter of Armenian country profile on "Flood Risk Management and approximation to the EU Floods Directive"); Japan International Cooperation Agency (JICA) has developed Seismic Risk Management Plans and Emergency plans; PPRD East 1 Programme which provided support to the EaP countries in the field of civil protection.*

	creating a well-equipped administration, which is imperative for the application and enforcement of the acquis.
Clarify command and control chain within regulatory framework of the RA.	With the Government Decree No. 1527-N of 25 December 2014, the Ministry of Emergency Situations merged with the Ministry of Territorial Administration giving birth to the new conjoint "Ministry of Territorial Administration and Emergency Situations" (MTAES). This has granted a less redundant command and control chain quickening the communication flow. Information is now directly passing from the MTAES headquarters to the Regions without having to involve 2, or more, different Ministries. This has also created a common normative and institutional ground for emergency planning and "territorial administration" within one institution with clear beneficial reflections on the general emergency management. Emergency plans are well developed and distributed throughout the country and are updated on a yearly basis. MTAES has also fully established a National Management Crisis Centre with state of the art equipment. This Centre is being currently networked with Regional Management Crisis Centres with analogue regional infrastructures. National and Regional centres provide a very robust scientific and logistic infrastructure allowing full coordination and rapid support to field activities. Accordingly to information gathered during this assessment, the only downbeat, that is currently diminishing the effectiveness of the command and control chain in the RA, is the low preparation of local duty holders. Reception of messages from

	central level and their elaboration (i.e. activation of operative phases) seems to be somehow problematic. Capacity building activities should be done to strengthen this last, but extremely important, link in the whole CP chain.
Reduce incongruence in the normative framework for the comportment and on responsibilities of local authorities and organizations.	As stated in legal recommendation #2, the normative framework is currently being completely revised, as the establishment of the new MTAES requires a thorough review of the entire institutional setup. The newly established MTAES has the powers to promote both emergency planning and territorial administration initiatives, which is greatly reducing incongruence. Full effects should be thoroughly analysed only after next 2-3 years.
A revision of the local institutions' legislative framework of Armenia is necessary aiming for the implementation DM and DRR strategies.	As above mentioned, great work has been done in the revision of national and local legislative framework. The positive contribution of the very active Armenian DRR National Platform (established in 2010 and ever since growing) and its positive collaboration with MTAES are endeavouring to fully comply with this recommendation. In addition, MTAES is currently working on the review of the DRR National Strategy and development of its Action Plan for 2016-2020.
Adopt strategies for the enforcement of private sector and local municipalities emergency planning.	Emergency plans are updated every year in accordance with the current legislative framework. Some interesting initiatives in this respect must be

	ascribed to the collaboration with NGOs and the Armenian Red Cross[2] but more efforts need to be done in this context in order to fully meet recommendation requirements.

3.2 Institutional framework

PPRD EAST 1 recommendations	Action taken
The National Platform for DRR has been established and some achievements have already been reached as shown by the 2011-2013 HFA Report. However, continuous effort in properly supporting the NP at institutional level, given its NGO nature, is seen as a priority to properly sew CP actions in the larger DRR perspective and further implement the HFA principles.	The Armenian DRR National Platform is very active and has full support of Armenian institutions. It has implemented a number of projects[3] and is providing a great inter-institutional and multi-stakeholder platform for discussion of CP actions and DRR initiatives. Continuous support to the DRR National Platform is strongly encouraged as it has its role to play in the development of all national DRR related strategies. The Armenian DRR National Platform is considered as an example of a good practice.
In order to strengthen the institutional CP/DM frameworks of Armenia it is necessary a greater involvement of the population. People have to know which kind of disasters can impact the area where they live and what they have to do in a case of disaster. The involvement of population as CP volunteers helps to fill this gap, but it needs	Current state of practice in volunteerism is as follows. 33 mixed (volunteer/professional) teams are being established (end of the activity foreseen by 2018) pairing volunteers and MTAES staff in the proportion of 18 Volunteers and 2 Professionals. Equipment is being provided by MTAES. This action

[2] *Two projects implemented by the Armenian Red Cross are worth being mentioned: i) "Building resilient local communities in Georgia and Armenia" (EU funded project) and ii) "Building safe and resilient communities" (Austrian Development Agency) which covers Armenia, Georgia and Azerbaijan.*

[3] *Projects that are worth mentioning: "Strengthening of National system of social protection resilience in Armenia" project implementation within the frame of DRR NP and UNICEF; "Coordination of psycho-social support for children in emergency situations" programme within the frame of DRR NP and UNICEF; "Disaster Risk Reduction in Armenia" project was launched in Yerevan, funded by the DG ECHO under the DIPECHO Programme; promotion of the UNISDR "Making Cities Resilient" disaster reduction global campaign helping 18 cities to join the initiative; further initiatives can be found at http://www.arnap.am/?lang=en.*

resources for training and equipment. Participatory process in the definition of emergency plan based on detailed risk maps, validated at local level, can largely improve the effectiveness of DM/DRR approach.	aims at covering remote areas that, due to insufficient funds and personnel, cannot be fully presided by professional fire-fighting teams. Special attention is being paid to forested areas where volunteers are mainly used for preventive measures. In addition to the 33 mixed teams there are other 109 Voluntary Response Brigades (equipped and trained by MTAES) patrolling communities residing in the proximity of forests. Communities manage those 109 brigades; they are self-sufficient and are coordinated by Regional Emergency Management Centres (under the umbrella of MTAES). The presence of such a volunteering force and its further regulation (so far there is no legal framework for CP volunteers) will provide a good starting point for participatory approaches in emergency planning at local level as volunteers are a privileged interface between local institutions and the population. Parallel to official teams of volunteers, as mentioned in Institutional recommendation #5, Armenian Red Cross and OXFAM have been promoting the institution of volunteers' teams in communities in Shirak, Tavush and Vayots Dzor marzes. Risk maps are still being produced, but many initiatives have been undertaken by the Armenian Government in this direction (Legal recommendation #1). The path is thus set and promises a good level of uptake of this recommendation in the near future.
The Crisis Management Centres represent the core of the CP/DM framework but they need to be equipped with innovative tools in order to provide alert message to the local level.	The National Crisis Management Centre has been, in the last 2 years, fully renovated and equipped. It can count on 24/7/365 coverage with 24/28 persons in each shift.

	Technical equipment is remarkable, using state of the art technologies such as real time GPS positioning for ambulances, police vehicles and fire engines; a fully functional network of webcams installed in all the critical points of the country with full coverage of the capital city of Yerevan; mapping and modelling for damn failures; 1500 critical buildings connected to the national anti-fire system (detailed maps with entrance and escape routes to facilitate access of the building to rescue teams); real time information on meteorological conditions; satellite imagery; established contact with the local volunteering teams. Regional Centres are in the process of being equipped and are in contact with the National Centre. Their full installation, done with the support of UNDP [project title and/or precise reference is to be obtained at the NAG meeting], should finish by the end of 2015, mid 2016.
Early warning systems can be very effective in case of weather related risks but in a case of seismic risks they are very far to be effective. Early warning system can support the prevention of, preparedness for and timely response to manmade and disasters caused by natural hazards, but they are only effective if they are able to provide alert on time to implement CP prevention, mitigation and preparedness activities and save people.	As mentioned in relation to the previous recommendation, the Early Warning System, in all its components, is getting maximum priority by the Government of Armenia. If on the one hand the coordination system that is being established is very strong, the weak end still lies in: • communities and local governments; • automatic weather station network. The first require capacity building activities addressed to local staff addressing the assimilation and elaboration of complex information sent from the national level, and the later needs to be modernized allowing MTAES to monitor the unfolding of hydro-meteorological events in real or near-real time.

	Further support and capacity building activities are necessary to fill the gap that is being created between the national/regional and the local level. The local level must be elevated to national standards with sound planning and connections to the Early Warning System. The creation of the volunteering teams can represent, in this context, a great opportunity to be seized. Volunteers are potential leverage for a widespread amelioration of the Local CP system (i.e. monitoring of rivers or of non automatic rain gauges). Also the weather station network needs an upgrade. At present there are only 47 weather stations in Armenia of which 10 automated. Data from the 42 non-automated weather stations is gathered, not in real time, by the Armenian State Hydro-Meteorological Service local branches. Moreover, a daily bulletin is issued but not during weekends as the staff is not sufficient to cover all the weekly shifts, which undermines greatly the entire cycle of early warning procedures. There are also 300 observers (physical persons) that support the observation network and monitor the most critical nodes of the river basins. However they cannot fully cover the national territory.
Weather predictions are essential in order to predict heavy rainfall, which can be used as inputs to hydrological and hydrogeological models defining hazard and risk maps for floods and landslides for the incoming days. Weather prediction, coupled with the suitable modelling, can support also the monitoring and forecasting of droughts and forest	The Armenian State Hydro-Meteorological Service in collaboration with the National Academy of Sciences/Informatics Department runs two forecast models: COSMO (Consortium for Small-scale Modelling) from DWD (Deutscher Wetterdienst), and WRF (weather research and forecasting). Forecasts are then refined through expert analysis[4].

[4] *Accuracy of 90/95% for maximum temperature, the rate is lower for precipitation.*

fires. Globally, numerical models for weather prediction are largely used and they became very reliable in the last years. Weather prediction are essential in order to predict heavy rainfall which can be used in input to hydrological and hydrogeological models defining hazard and risk maps for floods and landslides for the incoming days.	A platform for flash floods is experimentally used ("Black Sea Middle East Flash Flood Guidance[5]") that is an initiative funded by USAID and endorsed by WMO. Hydrological forecasts are conducted at seasonal scale. At the end of March a seasonal forecast is elaborated on the basis of fall/winter precipitation and snow for 85 rivers. The forecast covers April-June. For each river the maximum discharge level is forecasted. Levels are corrected on a daily basis using observations and numerical weather prediction models. In case of hazardous situations, the new procedures foresee that a warning is sent to MTAES and to the Armenian Rescue Service with immediate notification on MTAES web site. A bulletin is sent every day to concerned Ministries containing info about max/min temperature, rainfall (yes/no), water levels and reservoir levels, and observations together with critical threshold. A separate section is dedicated to Lake Sevan because of its strategic importance as fresh water reservoir. No mention has been made on the utilization of numerical weather forecasts for forest fires, nevertheless the necessary information are present and little effort would be needed in order to implement such a system.
The meteorological network has to be automated in order to collect data in real time, which is extremely useful in now casting of extreme events. Weather prediction, coupled with suitable models, can support also the monitoring and forecasting of droughts and forest fires.	The automatization of the Meteorological network is undergoing. The RoA is investing many efforts in the full development of its entire Early Warning System, including the upgrade of its meteorological network. However, more efforts are needed in this field.

[5] *http://www.wmo.int/pages/prog/hwrp/flood/ffgs/documents/BSMEFFG_UserGuide-opt.pdf*

Land degradation caused by over logging occurred during last several years could lead to an intensification of forest fires thus increasing the risk of desertification. The National Progress Report on the Implementation of the Hyogo Framework for Action (2011-2013) in section 6 put in evidence that Armenia is taking in place all the mechanisms to protect and restore regulatory ecosystem services including integrated planning and environmental impacts assessment. In particular, in cooperation with OSCE, the "Forest Fires Management in South Caucasus" project is being implemented. These types of efforts should be supported and intensified.	The Ministry of Nature Protection has inserted in its 2012-2017 Programme (chapter 3.2.4. Environmental protection) the following items: "*Provide further scale afforestation and reforestation growth, prevention of illegal cutting of forests, combating desertification, biological and Landscape Diversity maintenance, the reduction of harmful substances emissions from automobile transport, water and Full implementation of national forest programs*". In order to reduce the problem of deforestation and desertification the Armenian Government is also heavily subsidising irrigation in the attempt of mitigating their impacts. The promotion of agricultural development is thus used as a tool against the abovementioned problems. Further initiatives are thus needed to reduce the overconsumption of water and to promote containment of desertification through sustainable agricultural and silvicultural[6] plans in accordance with decision 1232-N of 2005 art 2.a of Armenian National Forest Program: "plan and implement the national forest policy and strategy of the Republic of Armenia in accordance with sustainable management of forests and forest areas targeted actions".
Concerning earthquake, prevention activities have to be addressed in the implementation of safety measures in buildings starting from the areas with the highest risk, defining rigorous guidelines and prescription for the construction of new housing.	Numerous activities have been undertaken in this direction (approximately 18 projects in the last five years addressed the issue of seismic vulnerability). The project "*Seismic Risk Assessment and Risk Management Planning Project*" implemented by JICA and MTAES [7] (2010-2012) conducted an earthquake simulation and developed scenarios for

[6] *Silviculture is the practice of controlling the establishment, growth, composition, health, and quality of forests to meet diverse needs and values.*
[7] *For more information read the final report of the JAICA Project at: http://open_jicareport.jica.go.jp/pdf/12086062.pdf*

	a swift response to reduce the vulnerability of Yerevan (where a third of the country's population is concentrated). So far much has been achieved in terms of preparedness with good coverage of multiparametric stations (more than 100 in the whole territory), decree 1351-N of 2012 has also included seismic risk measures in regional development plans and requested the revision of seismic hazard and risk maps. Funds are necessary to fully implement this. Regarding building codes and retrofitting they need revision (not EU compliant yet) and, moreover a large amount of funds is required to be able to introduce sustainable changes in this area, funds which, at the time being are not available.

3.3 Conclusion

Armenia has greatly developed its civil protection system since the end of the first phase of the PPRD East Programme.

Its central structure has been deeply modified permitting to strengthen the communication chain and the entire command and control system. The former Ministry of Emergency Situations has developed into a much more powerful and capable Ministry of Territorial Administration and Emergency Situations by merging two strategic Ministries. This resulted in drastic reduction of inter-ministerial bureaucracy and in the concentration of civil protection, urban planning and territorial administration policies in one institution. Results of such efforts are demonstrated by the compliance with many of the PPRD East Phase 1 recommendations.

There is however a number of enhancements, which the Republic of Armenia should implement in the incoming years in order to strengthen furthermore the national civil protection system:

- Volunteerism is being developed at institutional level but needs a full and developed normative framework ensuring rights and a clear set of duties of men and women serving as CP Volunteers;
- The meteorological observation network needs a full upgrade in order to comply with state of the art Early Warning System;
- Seismic building codes need to be revised and, to the same extent, retrofitting of vulnerable buildings should be carried on;

- Land degradation needs full attention as biodiversity loss; desertification and increased forest fire vulnerability are a constant and very serious threat to the economical sustainability of the entire country; and
- DRR awareness raising policies need to be coupled with the promotion of participatory approaches in local emergency planning. Armenia is investing a lot in DRR, but needs to involve to a greater extent the local population and local administrations.

4 Flood Risk Management and approximation to the EU Floods Directive

Key Assessors	
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4.1 Legal and institutional framework

Armenia has not yet officially adopted EU Floods Directive (EUFD) and therefore it is not included within Armenian legislation. At a national level, a management plan according to all aspects of the EUFD is not available.

The Republic of Armenia has developed its own Water Code since 1992. A totally updated version, adopted in 2002 and amended later on, regulates many aspects of national water policy, including development of water basin management plans - Article 5, dealing with basic principles of management, use and protection of water resources and water systems, while Article 19 defines the actions needed to establish an effective Water Resources Monitoring and Information System with the aim, among others, of forecasting on floods and mudflows.

The competent authority for water management is the Water Resources Management Agency (WRMA) established according to the resolution No 792-N, of 16 May 2002 of the Government of Armenia. The WRMA with its 6 Basin Management Organizations (BMOs) under the Ministry of Nature Protection (MNP) of Armenia is responsible for development and implementation of Water Basin Management Plans (WBMPs), along with the other main tasks related to water resources management in compliance with the National Water Policy[8] and the National Water Programme, and the definitions and prescriptions of the Water Framework Directive.

On 16 August 2007 the Government of the Republic of Armenia adopted the decree № 931-A on "recognizing as authorized body"; according to the decree, the Ministry of Agriculture has been recognized as state governing authorized body for organization and implementation of measures for prevention and elimination of adverse impact on river waters foreseen by the Water Code. Specifically, the Ministry of agriculture is responsible for:

[8] *The Law of the Republic of Armenia "On National Water Policy" was adopted in 2006 and follows the guidelines evolving from Article 15 of the Water Code of the Republic of Armenia for: 1) Sustainable Water Resources Management; 2) Water resources use and protection priorities; 3) Accounting and assessment of water resources; 4) Formation of Water Resources Demand; 5) Relations pertaining to water basin management.*

- anti-flood measures implementation;
- inventory of rivers and drainage systems in the country;
- creation of the database reflecting the actual state;
- development of programs on anti-flood measures;
- compiling design documentation and organization of works, operation and maintenance of bank protection structures.

Through the process of collecting information aiming to develop programs on anti-flood measures, the Ministry of Agriculture collaborates with regional government, community municipalities, as well as with state governing bodies and other parties that have experience and role in the sector. In particular, every year the Ministry of Territorial Administration and Emergency Situations presents proposals to the Ministry of Agriculture on implementation of necessary preventive measures that have been developed as a result of studies of flood prone hazardous segments of beds of rivers, drainage systems and flood control systems.

State Committee of Water Economy (SCWE) is a state body within the structure of the Ministry of Agriculture. SCWE develops and implements the policy of the Government of the Republic of Armenia in the area of water systems that are considered as state property and non-commercial water supply systems management and utilization, including all the functions associated to the hydro technical structure.

4.2 Current status of practices and area of excellence

EUFD is mainly implemented, in terms of flood hazard and flood risk maps compliant with the prescriptions of the Directive, through international pilot projects and single basin-scale initiatives. One of the most important initiatives is the PPRD East Programme Phase 1 during which the National Academy of Sciences, Institute of Geological Science (NAS IGS) has developed a nation-wide mapping of the flood hazard. Other projects relevant to the topic are the German Technical Cooperation Agency (GTZ) funded programme “Disaster Preparedness in South Caucasus” that focused on Lori and Tavush marzes in which NAS IGS was one of the implementer and “Model Guidelines For Water Basin Management Planning In Armenia” for the Meghriget River funded by USAID (in collaboration with the WRMA under the MNP).

It is also worth mentioning that within the PPRD East Programme Phase 1 all six Partner Countries (including Armenia) received training on the use of the MIKE 11 software. The software can be of help in the development of the flood hazard maps with the right quality standards. PPRD East Phase 1 committed to purchase MIKE 11 licences for the countries but never did. PPRD East Phase 2 is willing to fulfil this commitment, as the tested Open SWs (CEIWR-HEC and HEC-GeoRAS) did not match the expectations of the

beneficiaries[9]. It is yet to be clarified which MTAES office/department will use the licensed SW and and for what purposes.

The following paragraphs offer a more in-depth analysis of the results of the initiatives.

4.2.1 PPRD East Programme Phase 1

The results for this topic achieved during the EU-funded Programme for "Prevention Preparedness and Response to Natural and Man-made Disasters within the ENPI east region (PPRD East)" are summarized in a report named "The Development of Flooding hazard map/GIS Layer of Armenia". The NAS IGS carried out this Study. The first step was devoted to the delineation of the main basins and sub-basins crossing or falling within the borders of the Republic of Armenia. The second part of the Study is devoted to the sub-basin scale geological and environmental description: this section provides an in-depth analysis about the geological features, the geological condition and general permeability of the ground at the site, the spatial distribution of land use, the areas with drinking water, the areas with water for recreational use, the areas with water suitable for fish production and protected areas (including water resources). The data and their mapping have been provided by several national and international institutions such as: Ministry of Energy, State Water Cadastre, European Space Agency GlobCover Portal[10], etc.

A third section of the Study describes the climatologic, climatic and hydrologic features of sub-basins. The actual climatic conditions have been firstly addressed in terms of multi-year average air temperature, precipitation, relative humidity, snow cover formation and loss, snow cover height data collected by all the Armenian meteorological stations. Then the Study focuses on the forecast for impact of climate change on cub-basins climate.

The MAGICC/SCENGEN (http://www.cgd.ucar.edu/cas/wigley/magicc/) model developed by the University Corporation for Atmospheric Research (UCAR), with a 2.5° x 2.5° spatial resolution was used for developing climate change scenarios for Armenia, averaging the output of several Global Circulation Models (GCMs) to assess global warming magnitude (Santer, 1990[11]). The results are mainly oriented to the quantification of changes in the average regional temperature and precipitation in Armenia as forecasted by A2 and B2 greenhouse gas (GHG) emissions scenarios of the Intergovernmental Panel on Climate Change (IPCC). From the observation standpoint, the analysis has gathered the hydrologic data for 66 hydrological posts of 14 sub-basins (e.g., monthly average flow, the annual average flow, etc.).

On that basis the n-year maximum discharge values have been calculated with the methods of mathematical statistics. The annual maximal flow data series of hydrologic monitoring posts available in Armenian State Hydro-Meteorological Service (ASHMS) yearbooks have been used. The data have then

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[9] Communicated by Mr Hovhannes Yemishyan, Head of Population Protection and Elimination of Disaster Consequences Management Department of the MTAES and PPRD East 2 National Programme Coordinator, on 6 November 2015

[10] http://due.esrin.esa.int/page_globcover.php

[11] Santer, B.D., T.M.L. Wigley, M.E. Schlesinger, and J.F.B. Mitchell: Developing climate scenarios from equilibrium GCM results. Max-Planck-Institut für Meteorologie Report No. 47, Hamburg, Germany, 1990, 14 pp.

been processed using graphical-analytical and "moments methods" (Luchsheva, 1976[12]; Sokolovsky, 1968[13]) to calculate the maximum discharges for different probabilities of occurrences. At the same time, a part of the survey has been dedicated to build up an historical inventory of flood events based on the records of past floods since 1994 available in MTAES database. About 160 flood events were analysed by storing the date of the event, an internal sub-basins ID number, the river name, a settlement ID number, the settlement's name, the coordinates of the affected area (centroid), the economic losses, the number of victims (deaths), the number of displaced people and a short qualitative description of event. In order to design a comprehensive risk scenario, current state of rivers flood defence have been censed and listed. As a result of this survey, a complete list of flood protections and infrastructure is provided for the restrictions of waterbed clearance (type of water-work, length, coordinates), the embankments[14], reservoirs (coordinates, maximum retention volume) and natural water bodies (coordinates, estimate of the maximum retention volume). Finally, with the aim of developing flood hazard maps for the whole territory of the Republic of Armenia, geo-morphological and soil type mapping have been work out in detail by NAS IGS itself. Taking into account all information collected and description provided in this report, delineated sub-basins have been classified by the flood hazard level into 4 categories (extreme, high, middle and low). The map (at a river-basin scale) is provided as an ESRI[15] shape-file at a 1:100,000 scale. Critical flows have been derived by historical data and hydrological analysis[16].

4.2.2 Flooding, Mudflow and Landslide Risk Assessment in Tavush and Lori Regions of Armenia

GTZ has funded this initiative carried out in collaboration with NAS IGS and the Armenian Rescue Service.

A complex risk assessment in the Goris marz communities has been carried out. As a result, risks from the following natural hazards were assessed and mapped: flood, mudflow, landslide, strong winds, frosts, hails, and droughts.

With regard to Lori and Tavush, assessment of risks from floods, mudflows and landslides have been carried out in more than 130 communities. A disaster risk profile for each community has been developed, along with maps and recommendations to improve the situation. The processing of data collected in the field led to the development of risk assessment maps for each community. The results are summarized in 1:200,000 scale map based on the historical data archived at MTAES.

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[12] *Luchsheva, A.A.: Hydrology in practice. Leningrad, Hydrometeoizdat, 1976, 440 p.*

[13] *Sokolovsky, D.L.: River flow. Leningrad, Gidrometeoizdat, 1968, 539 p.*

[14] *Provided by the Ministry of Agriculture of Armenia. Records of flood prevention activities of 2005-2013 were analysed and the embankments were mapped by means of GIS software.*

[15] *Environmental Systems Research Institute*

[16] *Vulnerability studies: the methodology developed in collaboration with Parson – Brinckerhoff (https://www.pbworld.com/). Economic and social aspects have assessed independently from the hazard type. Again for PPRD Phase 1, an inventory of elements at risk has been listed: industrial hazardous sites, administrative buildings, industrial sites, reservoir, chemical pipelines, railways, hospitals, roads). Data have been collected form MTAES, MoA, MoEnergy, OpenStreetMap, Yerevan municipality, regional authorities.*

4.2.3 Water Basin Management Plans – related initiatives

Currently, the water sector is in the second phase of the reforms, which implies development and approval of the 6 water basin management plans. The Government of the Republic of Armenia, in February 2011, approved the content of the Water Basin Management Model Plan, which has been developed within the framework of the EU Water initiative – according to the requirements of the EU Water framework directive and Water Code. At present, the content of the model plan is a legal document and it is a technical assignment for the development of Armenia's Water Basin Management Plans.

The 3rd and 4th chapters of the Water Basin Management Model Plan contain to the emergency and prevention measures; the measures must be implemented within 6 years after the final approval of the plans by the government.

Currently, in Armenia there are several activities related to the development of a Water Basin Management Plan:

- Arpa river developed during UNDP/GEF Reducing Trans-boundary Degradation in the Kura-Araks River Basin Project (http://www.kura-aras.org)
- Akhuryan river under the EU funded project "Environmental protection of international river basins"(EPIRB) (http://blacksea-riverbasins.net/en). The plan will be submitted to the Ministry of Nature Protection in 2016.
- Model guidelines for water basin management planning in Armenia - Meghriget river implementation, funded by USAID (http://cew.am/en/news/show/182/8)

According to the requirements of the Government protocol decree N4 dated 03.02.2011, the South Water Basin Management Plan developed within the framework of the USAID Clean Energy and Water Program and the "Ararat valley water basin management plan" developed by the "Armhydroenergoproject" CJSC (the state budget funding) have been submitted to the Ministry of Nature Protection, which in 2016 will be submitted to the Republic of Armenia Government for approval.

The Water Resource Management Agency under the MNP is the national focal reference for them. Even if these initiatives are much more oriented to the Water Framework Directive than EUFD, it seems to us to be relevant to cite them as Water Basin Management Plans should include emergency plans (water management during emergencies) and disaster recovery plans. Moreover, regardless of the fact that, generally speaking, the flood risk is not assessed, a register of historical floods is set up very often and a census of natural and artificial water bodies are reported as well. For instance, a full characterization of the Meghriget River Basin was completed in the USAID project and published as Synthesis Report of Meghriget River Basin Characterization, also including a full description of the climate, hydrology and water quality, biology, geography, socio-economic situation, water use, water balance, major water resource issues of the basin and flood characteristics among them. Within this project, a section is dedicated to the guidelines for the calculation of maximum flow (floods) for both instrumented and non-gauged rivers (see the references

provided for PPRD East Phase 1[17]). Along the same lines, information is provided for historical flooding experiences, calculated peak flows and flood flood-prone areas and flood protection infrastructures. Finally, regard to the prescriptions of EUFD, it is significant to highlight as one of the outcomes of the project is a wide production of maps (with a varying scaling from 1:175,000 to 1:200,000) of several geological and hydro-geological layers such as: drainage areas of the sub-basins, average height, soil composition, annual precipitation, etc.

4.3 Findings and Recommendations

NEED OF IMPROVEMENT CLASSIFICATION: HIGH, MODERATE, LOW

1 – Transposition of EUFD into national law: HIGH

Armenia has not yet officially adopted EUFD and a management plan according to all aspects of the EUFD does not exist at national level.

It is recommended to draft basic national legislation on flood risks assessment and management in line with the requirements of EUFD, developed by a working group including all the stakeholders, both institutional and private.

2 – Units of management: MODERATE

The Unit of Management is a key concept of both EU FD and EU WFD and both Directives require to define a unit of management and associated management authority/organization based on the river basin management principle. Several EU MSs and international organization have established inter-institutional river basin council/committee for the purposes of developing and implementing River Basin Management Plan and Flood Risk Management Plans at basin level. According to the Water Code of the Republic of Armenia, the National Water Policy and the National Water Program, the WRMA has established 6 BMOs (one for each major Armenian basin); however, the BMOs are divisions within WRMA rather a coordination body among several institutions and stakeholders.

It is recommended to establish Water Basin Councils as coordinating institutions composed by representative of line-ministries, local authorities and general stakeholders involved into the entire flood risk management cycle (prevention, preparedness, response and recovery). The Water Basin Councils should receive the responsibilities and mandate to prepare Preliminary Risk Assessment, Hazard and Risk Mapping and to elaborate and implement Flood Risk Management Plans in conjunction with Water Basin Management Plans.

[17] *Plus:*
1 - Luchsheva A., "Practical Hydrology", Leningrad 1976.
2 - Luchsheva A., "Practical Hydrometry", Leningrad 1983.

3 – Preliminary Flood Risk Assessment: HIGH

During PPRD East Phase 1, NAS IGS was in charge for computing flood hazard and flood risk maps. A sort of preliminary risk assessment has been undertaken by analysing the MTAES database on floods. By doing that, much information[18] about the event has been digitalized; nevertheless this analysis did not lead to definition and mapping of areas of potentially significant flood risk (APSFR).

To this end the implementation of a training/capacity building programme for the institutional stakeholders is recommended.

4 – Flood Hazard and Flood Risk Maps: HIGH

Flood hazard and flood risk mapping have been both carried out in Armenia during last few years, nevertheless the approximation level to EUFD is still quite low. The flood hazard mapping by NAS IGS is not compliant with the detail level required by EUFD and have no directly relation to return periods (i.e., probability of occurrence), which is one of the main points of EUFD.

For this reason it is recommended to refine the previous studies in order to comply with these aspects and the implementation of a training/capacity building programme for the institutional stakeholders is recommended as well.

5 – Flood Risk Management Plans (FRMP): HIGH

Water basin management plans are in their final stretch for at least 4 major Armenia's catchments, nonetheless they are much more focused on water quality and water supply. For this reason, it is recommended to include flood risk management principles in line with EUFD.

It is noteworthy to recall that EUFD-compliant FRMPs also consist of an effective EWS. Armenia has already in place a system for weather and flood forecasting (managed by the State Armenian Hydro-meteorological Service) and response (MTAES).

Nonetheless, for a further development of the whole system, it is recommended to improve the efficiency of the observational network, increasing the number of automated stations (rain gauges, thermometers, hydrometers etc.).

6 – Data sharing: MODERATE

In order to increase both public awareness to flood hazard and flood risk mapping and inter-institutional information exchange, it would be beneficial to share those data using a state-of-the art web-based tool.

[18] *Date, location (sub-basin; river name), affected settlement, coordinates of location, area affected and a short description of the event*

For this reason, it is recommended to promote the use of the ERRA for both general public and institutional stakeholders.

4.4 Road Map

Topic	Recommendation	Who	How	When
EUFD transposition	Draft a by-law on management of flood risks including risk assessment in line with EUFD	MTAES (coordinator)	Establishing a working group including all the stakeholders to draft a by-law	Mid 2016
Units of management	Creation of Water Basin Management Council (s) as main implementer	Cabinet of the Ministers / MNP and Ministry of Agriculture	Update of the Water Code	Mid 2016 – end 2018
Preliminary Flood Risk Assessment	Develop methodological guidelines to comply with EUFD requirements from Articles 4 – 6	NAS IGS (coordinator)	Establishing a working group including all the stakeholders to develop methodological guidelines	End of 2016
Preliminary Flood Risk Assessment	Capacity building	NAS IGS (coordinator)	Implementation of a training/capacity building programme for BMOs	Mid 2017
Preliminary Flood Risk Assessment	Survey and maps drafting	Water Basin Management Council(s)	Application of the developed methodologies	End 2017
Flood Hazard and Risk Maps	Develop methodological guidelines to comply	NAS IGS (coordinator)	Establishing a working group including all the	Mid 2018

	with EUFD requirements from Articles 4 - 6		stakeholders to develop methodological guidelines	
Flood Hazard and Risk Maps	Capacity building	NAS IGS (coordinator)	Implementation of a training/capacity building programme for BMOs	Mid 2018
Flood Hazard and Risk Maps	Maps drafting	Water Basin Management Council(s)	Application of the developed methodologies	End of 2018
Flood Risk Management Plans	Including EUFD prescriptions (Art. 7) into Water Basin Management Plans	Cabinet of the Ministers / MNP, Ministry of Agriculture	Update of the current legislation on water basin management plans	End of 2016
Flood Risk Management Plans	Plans drafting	BMOs	Application of the EUFD prescriptions to RBMPs	End of 2020
Flood Risk Management Plans	Enhancement of the observational network	ASHMS (coordinator)	Purchase, installation and calibration of automated stations	2018
Data Sharing	Open access to flood-related data for public and institutions	MTAES	Proper profiling of the ERRA platform	Early 2016

5 Disaster Risk Assessment (DRA)

Key Assessors	
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Chapter validated by	National Advisory Group

5.1 Legal and institutional framework

The legislative body of national, ministerial, regional and local laws and decisions dealing with disasters is very large. The very cornerstone of the system is the Government Decree n.531 of 2008 "*on the establishment of staff of the Ministry of Emergency Situations of the Republic of Armenia*" state governing institution, which has later been integrated by the Decree 281/2012 "*on approval of the Disaster Risk Reduction National Strategy of the Republic of Armenia and the action plan for the implementation of the Disaster Risk Reduction National Strategy*". On 1 December 2014, the Ministry of Emergency Situations was reorganised and united with the Ministry of Territorial Administration by Presidential Decree, becoming the Ministry of Territorial Administration and Emergency Situations.

The disaster risk reduction legal framework is complemented by the Government of the Republic of Armenia decree 2 December 2010 n° 1694-n on the establishment of the Fund for Disaster Risk Reduction National Platform giving birth to ARNAP Foundation[19] (the Armenia National Platform for Disaster Risk Reduction).

As landslides and earthquakes are the most prevalent risks, it is worth mentioning the Law of the Republic of Armenia on Seismic Protection of 6 July 2002 al – 376 prescribing the basic elements for organization of seismic protection in the Republic of Armenia and regulating the relations connected with them and Government's Protocol decision N.27-5 of 10 July 2013 the Ministry of Territorial Administration and Emergency Situations stands as a leading institution, other stakeholder and institutions are responsible for inventory of monitoring of those objects and areas that are within the framework of their responsibilities/functions. For instance, the Ministry of Urban Development (MoUD) is the responsible Government institution for the inventory and monitoring of landslide risks for residential built-up areas, residential, public, industrial buildings and constructions. In accordance with the Article 8 of the RA Law on Seismic protection of 12 June 2002 MTAES/NSSP is in charge for the assessment of seismic hazard and risk reduction of seismic risk. According to Government decision N758-A, of 31 July 2014, a unified landslide database (GIS system) was established and a methodological guide for inventory and monitoring of landslide areas was elaborated.

[19] *ARNAP is a non-governmental institution founded by the RA Government contributing to the DRR initiatives at every level in Armenia.*

Climate change related issues are dealt with in accordance with Article 9 of the Statutes of the State Non Commercial Organizations approved by point 2 of the decision n° 1872-N of the Government of the Republic of Armenia of 28 November 2002. This decision designs the Armenian State Hydro-Meteorological Service for the assessment and forecast of the impacts of climate change.

In regard to the man-made hazards, the National Technical Safety Centre is competent institution for risk analysis and assessment of industrial hazardous assets aimed at classifying them according to hazard level, as prescribed by Article 18 of the RA Law on "State regulations on provision of technical security".

5.2 Current status of practices and area of excellence

Risk assessment is a long-standing effort of Armenian institutions, due to the high number of hazards that threat the country. For this reason, there have been and still are present many initiatives aiming to risk mapping related to different hazards. Anyway, risk maps and studies do not offer a detail level operationally useful for decision support during (or before the onset of) disaster. The following paragraphs give an overview of the most relevant initiatives and their results.

One of the most important experiences in terms of hazard and risk assessment for South Caucasus and for Armenia in particular is the Atlas of Natural Multi-Hazards of South Caucasus (2009) compiled by specialists from Armenia, Azerbaijan and Georgia using observational data. The contributors for Armenia were the scientific research company GEORISK, the scientific foundation "International Center Garni" and the Institute of Geological Sciences of the National Academy of Sciences. The Atlas contains GIS-based national-scale hazard maps of the earthquakes, landslides, debris flows, floods, droughts and hailstorms. These data has been organized into a GIS system, called Disaster-GIS hosted at MTAES/DPP[20].

Another relevant initiative to national-scale disaster risk assessment has been PPRD East Programme Phase 1. During the Programme, flood, wildfires, earthquake, landslides and technological/industrial hazard and risk maps have been developed in cooperation with Geocom LLC, Environmental Studies and the NAS IGS. In particular:

- the seismology hazard mapping was provided by Survey for Seismic Protection Agency (SSPA), a department of MTAES and developed from the template of the Global Seismic Hazard Assessment Programme (GSHAP). Available at district scale.
- wild fires have been modelled using the fuel model developed by ITC-Twente experts within different projects funded by the Dutch Government (e.g., the Matra Project) based on DEM (Aster GDEM) and land cover from the national available sources and satellite multispectral imagery. Available at district scale.

[20] *Department of population protection policy and programs and information flow management*

- landslides hazard has been evaluated from the geo-morphological potential for landslide. Base information layers are soils, geology and digital elevation model. Due to available data, Armenia's maps scale is 1:200,000.
- flood: see the Section dedicated to EUFD approximation. Available at district scale.

The risk level has been then computed cross-checking the likelihood of the hazard together with the vulnerability[21] mapping and the critical assets mapping.

All these maps and information are currently available to registered users on the ERRA platform installed at MTAES. As critical assets mapping is considered to be a very security-sensitive matter, only qualitative maps (3-class classification: high, medium and low) are available at the sub-regional and regional level. Nevertheless, the quantitative critical infrastructure/asset maps were developed and are available at the national level.

World Bank and MTAES are implementing the programme: "Programmatic Approach for the Armenia National Disaster Risk Management Program". The overall development objective of this program is to increase the disaster risk management (DRM) capacity of the Government by: (1) improving disaster risk information; (2) enhancing disaster risk reduction; (3) strengthening disaster preparedness; and (4) improving understanding of fiscal disaster risks and risk financing options.

As part of the Strategic Pillar I: Strengthening Disaster Risk Management in Armenia, the project will support the *Sharing and developing risk information*. Specifically, this activity includes: reviewing, compiling, and assessing existing hazard, exposure, and vulnerability assessments and information; establishing Geonode (open geospatial data platform for disaster risk information) to compile existing disaster risk information; conducting a seismic hazard assessment at the national level; and, scoping vulnerability assessment for selected public facilities.

The next paragraphs provide a deeper insight for seismic, landslide, mudslide and meteorological risk assessment in Armenia as a result of the short assessment mission of 22-24 June 2015.

5.2.1 Earthquakes

In the wake of Spittak earthquake in 1988, the Government of the Socialist Republic of Armenia founded the National Service for Seismic Protection (NSSP). Since then, NSSP guided the process for the development of programmes for seismic risk reduction (for Yerevan and nation-wide) in compliance with the Seismic Code of the Republic of Armenia (II-2.02-94). As of today 18 projects have been submitted by the NSSP and are currently operational or approved by the Government but not yet operational because of the lack of funding. The projects are organized to address 4 main issues: the monitoring of seismic hazard, the assessment of hazard level, the assessment of risk level, and the application of seismic risk reduction

[21] *The vulnerability assessment was based on the Prevalent Vulnerability Index, which sets out to interpret statistical data covering indicators of exposure and susceptibility, social economic fragility and lack of resilience.*

policies based on the recommendations coming from the 3 previous points. NSSP is a part of a wide network of international cooperation initiatives. Amongst the others, it is worth to recall the ones with:

- USGS for the installation of the IRIS seismic station (https://www.iris.edu/hq/programs/gsn), the first digital station in the region (broadband station).
- French Alternative Energies and Atomic Energy Commission for the installation, testing and maintenance of 24 test sites. As a result of this survey, 2 observation stations were installed and another one was planned to be installed by the end of June 2015 (those stations measure displacement) to monitor displacements of the reference points.

As of today, 115 observing stations are in place. They are manned, multi-parametric stations (retrieving geophysical and geochemical information, groundwater levels, etc.). Data are collected every day at 11 am, and on this basis NSSP perform a daily 'current hazard assessment'. If a potentially dangerous situation is envisaged, NSSP reports to the Scientific National Board under the MTAES. It is then the Minister of MTAES that has the duty to inform the Government.

The Global Seismic Hazard Assessment Program was launched in 1992 by the International Lithosphere Program with the support of the International Council of Scientific Unions, and endorsed as a demonstration program in the framework of the United Nations International Decade for Natural Disaster Reduction. As a result, in 1998 hazard maps were developed for all the territory of Armenia defining four separate class of acceleration (function of the gravity acceleration; a correspondence to the intensity scale is provided too), taking into account a return period of about 500 years, at a scale of 1:500,000. Because of the lack of funding, the maps were not updated ever since. From the research standpoint, after the earthquake of Zanzegur in 1968, two aspects were mostly investigated and further developed:

- prediction (one observatory was built in 1981, destroyed in 1988 and reopened in 2015 – in Garnin)
- enhancing the resilience of buildings.

Nowadays, an updated risk mapping is available only for major cities (in Yerevan, this effort was carried was carried out by JICA[22] in 2013. Intensity-measuring equipment was provided too). For other cities and settlements, as some of the previous 18 projects recommend to insert risk mapping in the Community Development Plans, maps for some of them have been produced at borough-scale (even if asset-scale would be much more effective). Web-access to this information is envisaged as soon as the SSPA web-site will be retrofitted. Moreover, SSPA manages also an earthquake Excel-database: entries date back to ancient age (manuscripts reporting the effects). For more recent records, information is stored about the characteristics of the event (physical, geochemical, location, date and duration, intensity and damages).

[22] *Japanese International Cooperation Agency*

5.2.2 Landslides

The development of a landslide risk mapping using GIS in Armenia was tested in 2000 for the first time. A landslide risk map at the scale of 1:200,000 and a number of 3D models of large-scale landslides were developed. This data are kept at the MTAES.

The Government's decision n.1 of January 11th, 2007, assigns the Ministry of Urban Development[23] as the responsible state agency for landside risk management in Armenia. Consequently, a comprehensive analysis of the situation was commissioned to JICA in 2004-2005, during which digital landslides map at the scale of 1:100,000 was created, including 2500 landslides. Detail studies were prepared on 131 landslides throughout Armenia[24]. Detailed information was provided on physical parameters, as well as trends and possible losses for each registered landslide at a community scale. The aftermaths of this survey was the of the 2007-2015 landslide risk mitigation activity plan. This plan included an estimation of the annual financial resources required for each case for a total allocation of more than US$ 18 million.

Amongst the many initiatives dealing with the matter there are 3 of them deserving a citation. Within the context of the Global Facility for Disaster Risk Reduction (GFDRR), the World Bank and the United Nations International Strategy for Disaster Reduction (UNISDR) and under the umbrella of the Central Asia Regional Economic Cooperation (CAREC) programme – has initiated in 2004 the Central Asia and Caucasus Disaster Risk Management Initiative (CAC DRMI) with the aim of reducing regional vulnerability to the risk of disasters. One of the outputs of project was a nationwide mapping of landslide computed by Norwegian Geophysical Institute (NGI). The classes of risk (low, moderate, high and very high respectively[25]) were computed and are related to average annual incidence of landslide hazard events based on the reported disasters at a scale of 1:500,000. World Bank and Columbia University's Earth Institute, and a number of international partners[26] were the main actors involved in the Natural Disaster Hotspots that began in 2005. The project also benefited from close collaboration with the, and others. The Norwegian Geotechnical Institute undertook the research on landslide hazards. Nearly 300 of the largest landslides were mapped in as active within a 700km^2 wide area, involving 100 settlements, and approximately 400,000 people. Typical features of landslide were also surveyed (area, thickness type of movement of slip surfaces). With this aim NGI firstly produced landslide hazard map for Armenia (with support from the Armenian Scientific Research Company), which were put into comparison with GEORISK historical archive of landslides, showing on the average a very good agreement.

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[23] During the short assessment mission MoUD representatives were not available for a meeting

[24] Management of landslide disasters in the Republic of Armenia/Terms of implementation of conducting events in 131 most risky landslide areas in the Republic of Armenia

[25] Low corresponds to an annual incidence of 0.1, moderate in the range of 0.11-0.3, and high, in the range of 0.31-0.8 and very high, greater than 0.81.

[26] Amongst them, Norwegian Geotechnical Institute (NGI), the United Nations Development Programme (UNDP), the United Nations Environment Programme (UNEP), the United Nations Office for the Coordination of Humanitarian Affairs (OCHA), the United Nations World Food Programme (WFP), the U.S. Geological Survey (USGS), the United Nations International Strategy for Disaster Reduction (ISDR).

Finally, funded by Swiss Agency for Development and Cooperation, the Assessment of Disaster Risk in Communities of Syunik Marz in Armenia (2009) has been carried-out as a complex assessment of risks in the communities of Goris. As a result, GeoCOM LLC in collaboration with JICA have carried out the seismic, floods, mudflow, landslide, strong winds and hail risk assessment in a number of communities in Goris area.

5.2.3 Mudflows

Studies on mudflows in Armenia started in 1972, based on which maps of 1:200,000 scale for mudflow hazards were created. Later, various maps were developed and published at different times. A mudflow hazard map at the scale of 1:500,000 was developed by the Armenian Rescue Service within the "National Action Plan against Desertification in Armenia" programme in 2002. The latest studies were conducted in 2007 within the project "*Upgrade and Restructuring of GIS Databases, Development of Databases and Management Programmes for the Water Resource Management Agency of the RA Ministry of Nature Protection*". Mudflow risks were identified based solely on registered facts. As a factor indicating risk areas, assessment was conducted in those areas where mudflows took human lives and caused damage to engineering structures, agriculture, environment and ecology. Mapping of areas and surrounding landscape zones was based on the mapping of past mudflows area; this was selected as the most trustworthy mapping method. Data on settlements influenced by mudflows and on damage caused recorded in official documents was used for identifying borders of mudflow impact.

5.2.4 Droughts, hail and frost

A study was conducted in ASHMS for the estimation of economic efficiency of hydro-meteorological services. For that purpose, data on the daily maximum and minimum air temperatures, maximum wind speed and the daily maximum rainfall volume was used for the period of 1966-2006. The meteorological vulnerability index[27], reflecting the risk of the influence of unfavourable weather conditions and hydro-meteorological hazards on the economy of the Republic, has been estimated as "fairly high".

1:500,000-scale maps of drought, hail and frost hazards are available, which is not sufficient for risk assessment. There is no supporting database for the latter.

No coordinated work has been done in the country in mapping of risk elements of hydro-meteorological phenomena (buildings, population, livelihoods, structures of high importance, critical infrastructures), and in analysis of vulnerability of risk elements and estimation and mapping of risks and losses.

5.3 Findings and Recommendations

NEED OF IMPROVEMENT CLASSIFICATION: HIGH, MODERATE, LOW

[27] *http://www.gripweb.org/gripweb/sites/default/files/CSAReportArmenia201011.doc*

1 – Transposition of DRA EU Guidelines into legislative framework: HIGH

With regard to legal framework, the Decree 281/2012 "*on approval of the Disaster Risk Reduction National Strategy of the Republic of Armenia and the action plan for the implementation of the Disaster Risk Reduction National Strategy*", though including for the first time the DRR concept within Armenian legislation, does not make any reference to the approach and/or the good practices to be taken as benchmark for Disaster Risk Assessment.

It is then recommended to follow the EU approach and standards when drafting the necessary legislation.

2 – Institutional setup: MODERATE

The MTAES is the coordinating authorized body in civil protection during emergencies, yet there are several responsible bodies for risk assessment as a part of the wider frame of DRR (e.g. MoUD for landslides, MNP for mudflows and floods, etc.) This results in duplication of functions, which reduces the effectiveness of system. With this aim, a further legislative clarification about the duties of each actor is recommended. It should be also noted that the number of scientific institutions involved in fundamental science in disaster risk assessment is very limited, and the existing ones conduct studies independently.

In this case too, it is recommended to foster a wider collaboration between research institutes.

3 – Hazard mapping: MODERATE

As mentioned in the previous section, there are various hazard maps in the country addressing many perils. Nevertheless, different organizations use different methods for disaster risk assessment, besides there are no disaster risks digital maps of necessary accuracy and scale.

For this reason, it is recommended to develop a shared risk assessment methodology valuable for finer scales in line with the EU good practice for DRA. To this end the implementation of a training/capacity building programme for the institutional stakeholders is recommended as well. A further recommendation is to develop a multi-hazard approach, which is at present completely missing.

4 – Risk Mapping: MODERATE

Coherently with the previous point, risk mapping is currently available at district scale or coarser and using different methodologies, so the same recommendation is pertinent.

In addition, it is recommended to develop shared methodologies of risk mapping that are appropriate for different purposes, e.g., strategic plans, emergency plans/contingency plans etc. To this end, the implementation of a training/capacity building programme for the institutional stakeholders is recommended as well. A further recommendation is to develop a multi-risk approach, which is at present completely missing.

5 – Data Sharing: MODERATE

MTAES is delegated by the Law as the collector of data coming from many institutional sources for risk management. However, as of today, Armenia still lacks a unified system for the publication and use of risk management information, a centralized hazard and disaster risk database, and a coordinated, nationwide disaster risk mapping initiative. To this end, it would be extremely beneficial to promote the use of state-of-the-art IT platform for data sharing, visualization, analysis and download.

It is then recommended to foster the use and spreading among institutional/non-institutional stakeholders of the Electronic Regional Risk Atlas (ERRA) developed during PPRD East Programme and currently installed at both NAS IGS and MTAES.

5.4 Road Map

Topic	Recommendation	Who	How	When
EU approximation into DRA national law, policies and regulations	Including EU approach in DRA	Cabinet of Ministers	Include Disaster Risk Assessment into the DRR National Strategy of the Republic of Armenia, currently developed by the MTAES	end 2016
Institutional setup	Legal clarification of the role for DRR stakeholders	Cabinet of Ministers	Include a proposal for new institutional setup into the DRR National Strategy of the Republic of Armenia, currently developed by MTAES	Mid 2017
Hazard mapping	Capacity building	MTAES/National Academy of Sciences (coordinators)	Implementation of a training/capacity building Programme for hazard mapping	2015-2016
Hazard mapping	Implementation of	MTAES/National	Establishing a	2015-2017

	methods for assessment for both single hazards and multi-hazard, fully compliant with EU guidelines	Academy of Sciences (coordinators)	working group including all the stakeholders	(including maps drafting)
Risk Mapping	Capacity building	MTAES/National Academy of Sciences (coordinators)	Implementation of a training/capacity building programme for risk mapping	2015-2016
Risk Mapping	Implementation of methods for assessment for both single risks and multi-risk, fully compliant with EU guidelines	MTAES/National Academy of Sciences (coordinators)	Establishing a working group including all the stakeholders	2015-2018 (including maps drafting)
Data Sharing	Open access to disaster-related data for public and institutions	MTAES	Adopt ERRA as national platform for sharing risk information data among institutions and the general public; develop and adopt a data sharing policy that facilitate the exchange of information among line-ministries	Early 2016

6 Disaster Loss Data Collection and Processing

Key Assessors	
PPRD East 2 Experts	Luca Molini Marco Massabò
Country Thematic Focal Point	Arsen Mkrtchyan
Chapter validated by	Arsen Mkrtchyan National Advisory Group

6.1 Legal and institutional framework

With the support of the Global Risk Identification Programme (GRIP), UNDP-Armenia has assisted MTAES in the establishment of a sustainable institution for the systematic collection, analysis and interpretation of disaster data to support national DRR policies and strategies. As a result, in 2010, the Government of Republic of Armenia endorsed the formation of Crisis Management Centre (CMC)[28] defining its mandate per decree. The disaster loss collection reporting and assessment system was then completed with the adoption of decree n. 1582/2011 of the Government of Republic of Armenia which sets methodologies and parameters for damage and economic loss estimates caused by natural and man-made disasters.

6.2 Current status of practices and area of excellence

Armenian system of data collection and storage appears to be fully developed and effective. During past years, the Republic of Armenia has developed its own disaster loss database with the financial and technical support of UNDP/GRIP through training workshops, advisory services towards establishing, institutionalizing and maintaining the database. To this end, MTAES departments (CMC and *Population Protection and Elimination of Disaster Consequences Management Department MTAES*) in charge of storing the disaster loss data have tailored existing standards to their needs, namely Centre for Research on the Epidemiology of Disasters' ones.

The construction of such a database has been carried out standing on three pillars:

- the existence of a national disaster management organization with the mandate to perform loss data collection and analysis;
- the existence of an infrastructure to support establishment and maintenance of database; and
- the allocation of human resources dedicated to collecting data and maintaining the database.

The legislation focused on both man-made and natural disasters, moreover man-made disasters are meant in the broadest way taking into account also information about accidents of various sources. Data are

[28] *Crisis Management Centre under Ministry of Territorial Administration and Emergency Situations.*

collected at a central point by CMC, but the Department of Population Protection (DPP) keeps the back-up database. Both Departments are in charge of validating, crosschecking and exposing the data.

The bottom-up chain of administrative authorities receiving reports when disasters occur strongly depends on the source of the report. Generally a commission is in place at different levels for estimation of legal and damages costs of emergencies:

- Community level (head: village mayor; members: local representatives of Ministries): collect and transfer data to higher levels
- Regional level (head: marzpet; members regional representatives of Ministries): transfer data to higher levels
- National level (head: Ministry of MTAES; members: MoD, MoUD, MoH, Police, MNP, MoTrans, MoA). At this stage, the Commission can prioritize the interventions during emergencies for compensation and transfer data to the Government.

The application areas of the disaster loss database are mostly: loss accounting and risk assessment. In the first case, statistics are published both quarterly and yearly (freely available on MTAES website), based on 3-year moving average. Since CMC stores data since 2005[29], a draft document of a 10-year statistics has recently been submitted to MTAES for revisions and it will be published on the website by the end of this year. Loss data are used by CMC to support disaster response during emergencies as well. The database is structured in a way that allows registering data and information of emergencies of different levels, from national to community level.

Compensation schemes have been established by law from 1998. Priority is given to compensation for disasters caused by natural hazards and, in particular, to restore public buildings (i.e. schools, hospitals and roads). The Law n. 57 of 24 May 1993, “about social protection of disabled people in the Republic of Armenia” and its amendment (17 May 2014) established compensation for all of law enforcement officers that suffer damages (1-month of wage for injuries, 1-day wage for damages to real estate, etc.).

Main users of the database are MTAES (various departments) and the National Statistical Service of the Republic of Armenia, established by Presidential Decree of 26 April 2000.

The entries of the database date back to 1992 and consist of any incoming calls to 911 (emergency number), 102 (police)[30] and 103 (ambulance). Those are transcribed into standardized forms (hardcopy) for official reporting.

Operative information about disasters is received in the Crisis Management Centre, which summarises the operative data. At the regional level disaster loss data is being compiled by the regional commissions and presented to the MTAES. The received data is then summarised by the DPP department of the MTAES and presented to the National Commission. Then, the National Commission presents these data to the RA Government.

[29] *In digital format.*
[30] *Except for crimes.*

The database is developed on an Excel base[31]. At DPP, the location of emergency situations related to natural hazards is mapped on a GIS layer available on a dedicated desktop computer. Aggregation of data is provided both by geographical (settlement) and sectoral criteria.

The cause that triggered the emergency is broadly included (flood, storm, car accident, etc.), but no further information is provided (magnitude, severity, etc.) excepting date and time of the beginning and duration. No identification code is labelled.

A complete set of information about the hazard is available only for fires since Fire Inspectorate is under MTAES and reports are collected directly. Regarding information about affected people, only gender and age (if under 18 years old) are collected and stored, without recording if they are directly/indirectly affected and/or where. Detailed information about the moveable assets (vehicles, livestock, crops) or real estate (houses, buildings) is not stored in the database[32] as this task is deemed to specific authorities.

6.3 Findings and Recommendations

NEED OF IMPROVEMENT CLASSIFICATION: HIGH, MODERATE, LOW

1 – Adapt current legislation and operational procedures to enable the sharing of loss data at European and International level: HIGH

The current legal and institutional framework of Armenia ensures an operational and systematic collection and recording of disaster losses. However, the classification of hazards and loss indicators differs from the minimum requirements of EU and the international standards and do not fully enable the share of disaster loss data at international level.

It is recommended to include in the current legislation and operational procedures the requirements of the Guidance for recording and sharing disaster damage and loss data *(JRC, 2015[33]). Specifically it is recommended to adopt the Extension 2 of the recommendations (Extension 2: data for specific events, for a specific hazard, damage and loss per NUTS2/NUTS3 and Unit of Management (UoM), by economic sector and by owner and by status of ownership (who bears the losses)).*

2 – Develop and adopt a unified methodology for assessing economic losses from disasters: HIGH

Collecting and reporting loss data is regulated by the two decrees of the Government of RoA, and different institutions collects data focusing on different aspects, however there is a lack of unified methodological

[31] *To be confirmed: the UNDP review of DLDs (http://www.undp.org/content/undp/en/home/librarypage/crisis-prevention-and-recovery/loss-and-damage-database.html) reports that the DB is MS Access-based.*
[32] *Except for fires that are under the responsibility of Fire Inspectorate*
[33] *Guidance for recording and sharing disaster damage and loss data – Towards the development of operational indicators to translate the Sendai Framework into action: EU expert working group on disaster damage and loss data; European Commission, Joint Research Centre, Institute for the Protection and the Security of the Citizen, 2015, ISBN 978-92-79-47452-1, ISSN 1831-9424*

approach for collecting and recording the economic losses associated with physical damages to different sectors as well as the sectoral indirect economic losses.

It is recommended to develop and adopt in current legislation a methodology for multi-sectoral economic assessment of disaster losses. Furthermore it is recommended to develop and implement capacity building actions for national and local institutions on the use of the methodology.

3 - Handling of uncertainty: MODERATE

A daily (for emergency calls) and a monthly (institutional sectoral reports) crosschecking of data are operationally performed by CMC and DPP. But, as uncertainties are inherent in every step of the disaster loss data analysis framework, disaster losses can only be estimated.

It is recommended to establish a framework for handling uncertainties in a transparent way adopting, for instance, a NUSAP or MAXO approach (see JRC recommendations, 2014). This Uncertainty evaluation should be stored and recorded with the final validated version of the data.

4 - Full development of an advanced IT system: HIGH

Data are currently reported to CMC / DPP through hardcopy formats and then archived in an Excel/MS Access structure. DPP maps disaster on GIS platform providing information about the location of an event. A more advanced IT system for recording, analysing and sharing disaster loss data would improve the entire process. The system should be developed for three main general needs:

- support the electronic registration of disaster data by local structures and improve data collection at local level,
- support the processing and spatial analysis of disaster loss data, and
- support the automatic sharing of data with national, regional and international institutions and stakeholder.

It is recommended to adopt or develop an advance IT system that can fully address the three main functionalities illustrated above. ERRA, and the possibility of enhancing its functionality for the recording and analysis of loss data, could help in the process, especially with the advantage of further sharing information and statistics at regional level within the ENPI East Partner Countries and other international institutions. Furthermore, it is recommended to develop and implement capacity building actions for target users of the platform.

5 - Encouraging PuP and PPP: MODERATE

The participation of all stakeholders in refining the requirements of loss database ensures ownership and enhance the utility, hence the future utilization, of disaster loss data. Public-public partnership (PuP) and Public Private Partnership (PPP) should be further encouraged and the role and utility of loss data should be

discussed across governmental departments, including emergency management, urban planning, and government budget and across all governmental scales and participative governance fora (local to national). High-level requirements should be informed by public and private needs across sectors.

It is recommended to increase the engagement of the private and public sectors into the process of data collection, recording and sharing.

6 - Information sharing: HIGH

Summary or aggregate statistics should be shared by an open data policy in a common data standard to support national and international disaster risk reduction processes, as well as public awareness to disasters. For example, the information exchange among different agencies usually relies upon official request.

It is recommended to develop and adopt a data sharing policy framework that facilitates national and international institutions, organizations and general stakeholders to access disaster loss data. ERRA platform can be the technological support for the implementation of the policy framework.

6.4 Road Map

Topic	Recommendation	Who	How	When
Legislation	Adapt current legislation and operational procedures to enable the sharing of loss data at European and International level	MTAES (CMC-DPP) and Cabinet of the Ministries	Update of the decree of the Government of Republic of Armenia 1582/2011	2016
Methodology	Develop and adopt a unified methodology for assessing economic losses from disaster	MTAES (CMC -DPP - NAS IGS)	Establishing a working group including all the stakeholders for the elaboration of the methodology. Provide training and capacity building to national and local authorities	2016

Uncertainty assessment	Adopt a shared methodology to estimate uncertainty	MTAES (CMC-DPP)	Establishing a working group including all the stakeholders	2016
IT upgrade for DLD	Use of an advanced IT system for data reporting	MTAES	Further development of ERRA platform for supporting the collection, recording, analysis and sharing of loss data. Provide training and capacity building to national and local authorities	2017
Public/Public and Public/Private Partnership	Enhance the engagement of various actors in DLD	MTAES (coordinator)	Consultations between different stakeholders	2017
Data sharing	Open DLD to public and institutions through ERRA	MTAES (coordinator)	Working group for the developing of data sharing policy framework on disaster loss data	2018

7 Inclusion of Disaster Risk Reduction in Public Spending

Key Assessors	
PPRD East 2 Expert	Antonín Petr
Country Thematic Focal Point	N/A
Chapter validated by	National Advisory Group

7.1 Legal and institutional framework

The procedures of the budgetary system and regulation of the budgeting process are governed by the Law of the Republic of Armenia on the Budgetary System of the Republic of Armenia from 21 July 1997 AL-137.

As stipulated by the Law, the state budget planning process is comprised of two phases: (a) preparation of the medium-term expenditure framework (MTEF) covering three years and (b) preparation of the budget proposal for the upcoming year. Organization of budgetary functions activities for the upcoming year and preparation of the medium-term expenditure framework, including elaboration of methodological indicators to perform necessary estimation for the purpose of forming state and community budgets is responsibility of Ministry of Finance (MoF).

The state budget reserves appropriations for the Cabinet contingency fund, which is the source to finance the expenditures not foreseen in the state budget. The Cabinet contingency fund is introduced in the expenditure part of the state budget as a separate line.

The Cabinet contingency fund shall not exceed 5% of the total budget appropriations programmed in state budget law for the given fiscal year.

7.2 Current status of practices and area of excellence

The PPRD East 2 team met during its assessment mission in Republic of Armenia representatives of various interlocutors who provided a clear description of the budget planning and its DRR and DRM related structure at various levels – central level – MoF, ministerial level - Ministry of Territorial Administration and Emergency Situations (MTAES), agency level - State Fire and Technical Safety Inspectorate, Seismic Protection Service, Hydrometeorology and Monitoring Service and municipal level - Yerevan city rescue department.

The budget planning starts from mid-term planning of budget expenditures (3 years) – Mid-Term Expenditure Framework. When MTEF is approved, the planning continues with annual budget planning for fiscal year. The structure of the state budget does not allow identification of individual prevention, preparedness and response expenditures. It outlines only response activities of Ministry of Territorial

Administration and Emergency Situations, which are under a separate budget line called “Maintenance of Rescue Services”. Another actions related to DRR and DRM are not listed as separate budget lines, but are “hidden” in budget lines of other Ministries, e.g. reinforcement of schools will be under budget line for education. However, the existing system allows the MTAES as the central governmental body responsible for civil protection and disaster risk management to have an overview of preventive measures that other Ministries plan to implement in the upcoming year.

7.3 Findings and Recommendations

It is possible to conclude that the existing legal and institutional framework provides a sound and solid base for budget planning for civil protection and disaster risk management. Thus, it contributes to and provides good potential for the country to meet the Sendai Framework for Risk Reduction 2015 and 2030, priority 2 – “Strengthening disaster risk governance to manage disaster risk”.

However, the existing system does not allow detailed insight into financial aspects of all individual DRR and DRM related actions, particularly when it involves actions that are less obviously related to DRR and DRM. Therefore, it is not possible to report exact amounts invested to prevention, preparedness and response, as well as, for reconstruction and rehabilitation measures by the various national and local stakeholders.

The ability to clearly identify, record and consequently to evaluate all expenditures within the DRR/DRM at national and local level would significantly help better planning and better use of the available financial resources what is even more important when the funds are limited.

In addition, it would also allow comparison of the real DRR/DRM expenditures against the disaster loss data. This comparison will help to prove that well planned investments into DRR/DRM significantly decrease the impact of disasters on population, environment, economy, infrastructure and cultural heritage, thus equally decrease the human and economic losses, i.e. saving money for response activities and liquidation of disaster consequences.

This is also supported by the Sendai Framework for Risk Reduction 2015 and 2030 which put an additional accent on “Investing in disaster risk reduction for resilience” (priority 3), more particularly on “promotion of the integration of disaster risk reduction considerations and measures in financial and fiscal instruments”.

This above described situation is caused by a lack of methodologies for allocating, tracking and registering of all DRR and DRM actions in the budget system at both levels – central and local. Therefore, the PPRD East 2 recommends the following:

- revise and if not sufficient, enhance the national institutional CP/DRM framework in order to provide/create adequate capacity for development and implementation of the new DRR/DRM budget allocation tracking and recording system;
- develop and implement a methodology for the DRR/DRM budget allocation tracking and recording system across the national system and replicate it at the local level. As a part of the methodology,

establish a DRR/DRM "marker" to flag those investments for which the outcome is not explicitly DRR/DRM but which through implementation will contribute to reduce/mitigate disaster risk;

- develop and implement a methodology for evaluation of the DRR/DRM expenditures that give simple quantifiable indicators showing fiscal impact of the DRR/DRM; and
- create and deliver trainings on the new methodologies for officials from financial units from all relevant national institutions dealing with DRR/DRM measures directly or indirectly.

7.4 Road Map

The road map proposes the prioritization of the recommendations, timeframe for their implementations and responsibilities of involved interlocutors.

Activity 1.1 - Workshop to introduce and discuss the concept of the DRR budget allocation tracking and recording system

Responsibility: Shared responsibility of the MTAES, MoF and PPRD East 2 Programme

Timeframe: by April 2016

Support: all national interlocutors active in DRR/DRM

Activity 1.2 - Development of the methodology for the DRR budget allocation, tracking and recording system

Responsibility: Shared responsibility of the MoF and MTAES

Timeframe: by October 2016

Support: PPRD East 2 Programme, ARNAP partner organizations

Activity 1.3 – Development of the methodology for evaluation of the DRR expenditures

Responsibility: Shared responsibility of the MoF and MTAES

Timeframe: by March 2017

Support: PPRD East 2 Programme, ARNAP partner organizations

Activity 1.4 - Development of the training curriculum on the new methodologies

Responsibility: PPRD East 2 Programme, MTAES Crisis Management State Academy (CMSA)

Timeframe: by June 2017

Support: MoF and MTAES, ARNAP partner organizations

Activity 1.5 - Finalisation of the training programme preparation

Responsibility: PPRD East 2 Programme, MTAES CMSA

Timeframe: by September 2017

Support: MoF and MTAES, ARNAP partner organizations

Activity 1.6 – Drafting and endorsement of a legal document to institutionalise the new system for the DRR budget allocation tracking and recording system

Responsibility: MoF and MTAES

Timeframe: by December 2017

Support: PPRD East 2 Programme

Activity 1.7 – Delivery of the training on the new methodologies

Responsibility: Shared responsibility of the MTAES and PPRD East 2 Programme

Timeframe: by January 2018

Support: MoF

Activity 1.8 – Implementation of the new methodologies for the DRR budget allocation tracking and recording system and for evaluation of the DRR expenditures

Responsibility: Shared responsibility of the MoF and MTAES

Timeframe: by June 2018

Support: all national interlocutors active in DRR

8 Host Nation Support

Key Assessors	
PPRD East 2 Expert	Phil Langdale Michael Elmquist
Country Thematic Focal Point	Tigran Gidachyan
Chapter validated by	Tigran Gidachyan National Advisory Group

8.1 Legal and institutional framework

Numerous aspects of Host Nation Support are covered within the following pieces of legislation:

- Bilateral agreements are in force with Belarus, China, Georgia, Montenegro, Poland, Russia, Switzerland, Sweden, Turkmenistan, and Ukraine;
- Armenia has signed up to / pledged to / aligned with the following international agreements / guidelines affecting host nation support[34]:
    - Tampere Convention,
    - The 2006 Kyoto Convention on customs procedures
    - NATO Memorandum of Understanding on vital cross-border transport.

Other relevant international agreements:

- Agreement between the United Nations and the Government of the Republic of Armenia was concluded in January 2014 on organising import, export and transit of humanitarian goods and on entry of personnel of humanitarian assistance in a simplified manner during disasters and emergency situations;
- Agreement among the Governments of the Black Sea Economic Cooperation (BSEC) Participating States on collaboration in emergency assistance and emergency response to natural and man-made disasters, signed on 15 April 1998;
- Agreement on cooperation in prevention and liquidation of consequences of emergency situations of natural and technological nature of the CIS countries signed on 22 January 1993.

Major pieces of applicable national legislation include the followings:

- Emergency Action Plan of governmental organisations;
- Government Decree No. 66-N of 2003 on the goods provided as humanitarian aid; and
- Government Decree No. 919 of 10 June 2011 on the population protection plan in case of a strong earthquake.

[34] *PPRD East Programme Phase 1: Study on the Provision of International Assistance and Host Nation Support.*

8.2 Current status of practices and area of excellence

The merger of two Ministries to form the Ministry of Territorial Administration and Emergency Situations suggests a wider cooperation of departments within the country. The subject of Host Nation Support is understood within the relevant departments, even though there is no single structure or documents to support the process. Various Governmental departments have responsibility for subject areas of disaster management, and especially response in a case of disaster. For example, the Ministry of Health will carry out drug and medicine control of incoming assistance, and the Ministry of Communication and Transport will provide any necessary resources. Nevertheless, it would be beneficial to formalise this into Standard Operating Procedures (SOPs) or any other similar document that fits the most Armenian civil protection/disaster risk management legal and institutional system.

8.3 Findings and Recommendations

It was apparent, during discussions at the National Advisory Group meeting held in November 2015, that Host Nation Support is well understood and incorporated in the emergency plans of individual departments. The Government of Armenia is not of the opinion that there is a need for a single, consolidated SOP for HNS. However, the existing arrangements will be tested in the forthcoming TTX, and the outcome of the TTX will determine if there is a need to consolidate the HNS arrangements into a single plan supported by the relevant legislation.

8.4 Road Map

As the Ministry responsible for the coordination of all rescue activities, the Ministry of Territorial Administration and Emergency Situations should head the planning for the Table-Top Exercise (TTX) planned for 17-19 May 2016 and ensure that all relevant Ministries and departments are available and ready to participate in the exercise.

Based on the findings of the exercise, the MTAES, in consultation with the other participating Ministries and departments, will determine the need, if any, for the further development of Host Nation Support.

9 EU approach to Volunteerism in Civil Protection

Key Assessors	
PPRD East 2 Expert	Davide Miozzo
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Chapter validated by	National Advisory Group

9.1 Legal and institutional framework

Armenia has greatly developed its civil protection system in the past years. In fact since 2014 (with decree n. 1527/2014) the Ministry of Emergency Situations merged with the Ministry of Land Management Urban Planning and Construction giving birth to the new conjoint "Ministry of Territorial Administration and Emergency Situations" (MTAES). This has granted a less redundant command and control chain quickening the communication flow. It has also created the common grounds for both emergency and urban planning under the control of one institution with beneficial reflections on the general emergency management. Emergency plans are well developed and distributed throughout the country; they are updated on a yearly basis. Thanks to some recent international projects[35], further capacities have been developed (i.e. Regional Plans for Earthquakes approved with Decree n. 919/2011). The Mayor is the key figure in the command and control chain at local level; he chairs the local emergency management commission involving all authorities. In addition, emergency plans define activities for all the functions. Some procedures need to be refined at local level where there is little space given to participatory approaches for emergency planning. However, the overall result has been a drastic reduction in bureaucracy and a general amelioration of communication with Marzes (administrative regions).

MTAES, on a yearly basis, delivers guidelines to all civil protection stakeholders providing clear objectives for awareness raising activities and field exercises to which mainly CP personnel participates. MTAES also provides material awareness campaigns developed at ministerial level[36].

As other countries in the area, also Armenia has instituted the obligation amidst its major companies to adopt their own emergency plans. Both private and state owned companies create "response groups" based on the personnel capacity and skills. Those response groups are prototypal formations of CP volunteers; they follow the prescriptions of the company emergency plan in accordance to directives of MTAES and under its direct command.

The creation of a general volunteering system is being at the moment discussed in the Parliament. Protocol Decree 42 of 2014 has introduced institutionally the concept of volunteering and has set a work plan for the incoming years. Volunteers are thus a not fully structured force in the emergency response system but

[35] *Seismic risk assessment and management planning of ROA, Japanese funded project, 2012.*

[36] *As per decree №134-N of 30 January, 2003 on «Defining rules of preparation of the RA Governmental and Self-Government bodies and organizations in the field of emergency situations and civil protection, as well as on education of the population» and its later amendments (last of which in 2014).*

they are deemed as indispensable by all the institutions dealing with civil protection activities as support to responding forces during major events.

Armenia has also a very active DRR National platform, established in 2010 by the Government Decree. The main goal of the Platform is to support in the establishment of multi-sectoral mechanism for disaster risk reduction in the Republic of Armenia. Amidst its thematic groups there is also one on Volunteering.

9.2 Current status of practices and area of excellence

After the 1988 Spitak earthquake a volunteer movement has been established in Armenia. Not having a legal framework regulating the activity of volunteers didn't stop the creation of first responding teams, especially in the field of forest fire extinguishment. 33 mixed teams are being established (end of the activity foreseen by 2018) pairing volunteers and MTAES staff in the proportion of 18 Volunteers and 2 Professionals. Equipment is provided by MTAES. This action aims at covering those remote areas that cannot be covered, due to lacks of funds and personnel, by professional teams of fire fighters. Special attention is being paid to forested areas where volunteers are mainly used for preventive measures. In addition to the 33 mixed teams there are other 109 Voluntary Response Brigades (equipped and trained by MTAES), which reside in communities in the proximity of forests. Communities manage those 109 brigades; they are self-sufficient and are coordinated by Regional Emergency Management Centres (under the umbrella of MTAES).

In addition to those 142 officially registered teams there is a relevant number of persons that is getting in contact with MTAES to obtain training and to participate in exercises promoted in municipalities. It must be noted that, according to the Art. 1 of the *Law on population protection in emergency situations* from 1998, "rescuers" are "*physical person foreseen to fulfil rescue activities and certificated by the Legislation of the Republic of Armenia*". Thus, only persons in possession of an official recognition (delivered by training centres recognized by MTAES) are allowed to serve as first line rescuers. The others can still take part to volunteering activities but cannot be involved in the first line and can only offer assistance to affected population.

Team of volunteers, trained by the Crisis Management State Academy[37], have the role of monitoring the insurgence of forest fires and taking the necessary measures in order to contain the fire in the attendance of the intervention of regular teams.

Moreover, since 2006 MTAES has greatly developed its coordination centres. The creation of a National Management Crisis Centre (and the following institution of analogue Regional Centres) allows the full coordination of field activities with a very robust scientific and logistic support from the National Centre. The Centres are also in contact with the 109 brigades and the 33 voluntary teams and follow their activity in case of activation.

[37] *Founded as a personnel training institute by Resolution No. 74 dated 31 January 1992 of the RoA Government*

The Armenian Red Cross (ARC) is very active in the promotion of a regulated volunteering system. It has a long lasting MOU signed with MTAES but also promotes the signature of MOUs with Marzes, Regional Rescue Service and municipalities defining roles and responsibilities of volunteers deployed in rescue activities. After signing those MOUs, MTAES started taking into account those unofficial volunteers as valuable resource and thus is increasingly involving them into exercises that are being promoted at local level. Moreover, within the EU funded project "*Building resilient local communities in Georgia and Armenia*"[38], the Armenian Red Cross, in collaboration with civil protection stakeholders, has conducted vulnerability and capacity assessments in communities facilitating the creation (and training) of local teams of volunteers. This project has been a great opportunity to favour knowledge exchange amongst countries that are in the process of creating an institutional volunteering system.

Oxfam is also carrying out several projects aiming at the creation of volunteering teams and building community resilience. Within these activities it has created local centres used for continuing education projects with the idea of using them as local operational centres for volunteering activities.

Volunteering activities are promoted, by MTAES, since early ages by introducing the concept of Civil Protection. The "Young Fire Fighters", for example, are teams of youngsters (min. 14 years old) offered as occupational and training opportunity with great care placed into reaching out to the vulnerable population. Volunteering is thus also communicated to the population as a possibility to gain training and a professionalization in the field of civil protection. It offers possibilities to disadvantaged people affiliating them, in a very positive way, to the civil protection system. This provides a great outreach and further dissemination of civil protection knowledge across the entire population.

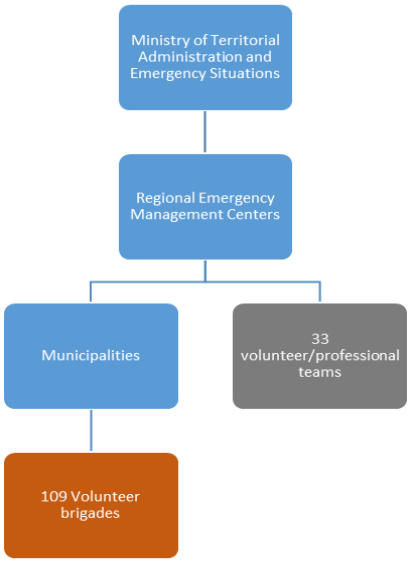

Figure 1 Volunteering system in Armenia

[38] *More information at: http://redcross.am/en/whatwedo/Building+resilient+local+communities+in+Georgia+and+Armenia/3/20/18/58*

9.3 Findings and Recommendations

NEED OF IMPROVEMENT CLASSIFICATION: HIGH, MODERATE, LOW

1 – Legal framework: HIGH

The legal framework needs to be improved acknowledging and regulating the existence of volunteers as operative component of the Ministry of Territorial Administration and Emergency Situations. There are different portions of Laws that must be addressed within the unified Law defining precisely all the components of the volunteering system: selection, training, equipping, managing, exercising and deploying. This would allow defining the areas of intervention of a volunteer and of the volunteer organization both in crisis and in peacetime.

It is recommended to adopt a Law on Volunteerism and to develop a thematic legal framework addressing roles, duties, responsibilities and a clear command & control chain within civil protection activities for both volunteers and volunteer organizations.

2 – Institutional setup: LOW

Volunteers are a widespread reality in Armenia. They are present in all the municipalities, are trained and accounted by MTAES. The presence of volunteer teams working with professional operators grants a high level of involvement and greater learning opportunities for the volunteers. Training is comprehensive and carefully carried on. MTAES is undergoing the effort of linking all volunteering realities to its Regional Centres. The command and control system is very well structured although missing SOPs for the definition of roles and responsibilities of volunteers. This needs to be coupled to the normative activity to be carried on in recommendation 1. RoA has the advantage of being able to monitor projects under implementation, which are dealing exactly with the definition of standards for volunteers. These projects are carried out by important stakeholders in the field of volunteering (ARC and Oxfam). The analysis of their results can play a valuable resource in the establishment of effective SOPs and criteria regulating volunteer activities.

It is recommended to develop and specify the roles of volunteers and volunteer organizations by monitoring the existing projects and volunteering realities. Best practices should be selected and discussed at national level in order to find optimal solutions for drafting SOPs perfectly fitting the Armenian society.

3 – Networking with volunteer organisations: MODERATE

Volunteering organizations and groups are a solid reality with very good connection between themselves and MTAES. Most volunteers are accounted for and included in the network. However there are a number of unregistered volunteers that could be of valuable use to MTAES if they are included in the official volunteering system.

It is recommended to develop a national database, subdivided at regional levels, of volunteers and volunteer organizations accounting for personal skills and available equipment.

4 – Protection of volunteers: HIGH

Art. 1 of the *Law on population protection in emergency situations* from 1998 clearly states that any rescuer must be a certified and expert person. This reduces the possibility of deploying non-expert personnel during emergencies. However, protection of volunteers must be instituted by Law providing juridical tutelage and insurance.

It is recommended to define a legal framework defining duties and rights including the provision of health insurance for all volunteers called to help MTAES in its institutional duties.

5 – Funding of volunteer organisations: HIGH

Sustainability of the volunteering system is mainly granted by MTAES and local communities. However, long lasting sustainability must be achieved by empowering Volunteer Organizations in the field of financial sustainability. By doing so, the organizations can be active promoters of awareness raising initiatives and finance their own volunteering campaigns.

It is recommended to empower Volunteer Organizations in the field of self-financing by providing an adequate capacity building plan addressing financial sustainability of Volunteering Organizations.

9.4 Road Map

Topic	Recommendation	Who	How	When
Legal framework	Adopt Law on Volunteerism	Cabinet of Ministers, Parliament	Initialling the text of the draft Law on Volunteerism, included provisions on Civil Protection Volunteering activities.	2015-2016
Legal framework	Develop a thematic legal framework	MTAES	1) Study and testing of SOPs by relevant stakeholders.	2016-2020

			2) Promulgation of additional thematic SOPs for Civil Protection Volunteers.	
Institutional setup	Setting up a minimum set of juridical and technical requirements (SOPs) for the involvement of volunteer organisations in CP system	MTAES (coordinator) Volunteer Organizations Volunteer Groups	Establishment of a working group including all the relevant stakeholders to develop SOPs	2016-2018
Institutional setup	Monitoring the effectiveness of the developed standard and SOPs	MTAES	Evaluation survey	2016-2020
Networking with Volunteer Organizations	Assessing gaps and weaknesses and identifying areas of support of volunteer organizations	MTAES	Provide a comprehensive assessment of existing volunteering system that will feed into a national database of volunteers	2016
Protection of volunteers	Insurance for volunteers	Cabinet of Ministers; Parliament	Including insurance in the draft Law on Voluntarism	2015-2016

Funding of volunteer organizations	Adoption of strategies to sustain the development of voluntarism	MTAES	Establishing a working group including all the stakeholders and adopting the strategy	2016-2020

10 Raising Awareness about Disasters

Key Assessors	
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Chapter validated by	National Advisory Group

10.1 Legal and institutional framework

The area of raising awareness about disasters is govern by a set of legal acts that includes mainly the Law of the Republic of Armenia on population protection in emergency situation from 2 December 2 1998, the Law on Fire Safety, No. ZR-176 from 15 May 15 2001 and Government Decree on Integration of Seismic Risk Reduction Measures in Regional Development Programmes from 7 March 2012.

10.2 Current status of practices and area of excellence

The assessment of raising awareness about disasters, which was conducted through a number of meetings with national stakeholders, showed that that there is many on-going activities organised and conducted by the interviewed institutions.

The Ministry of Territorial Administration and Emergency Situations of Republic of Armenia (MTAES) as the main governmental organisation responsible for the awareness raising about disaster is very active and together with its ministerial divisions covers a broad spectrum of activities. The Ministry leads the development of a new National Strategy on Awareness Raising about Disasters, however during the assessment mission, it was not possible to observe what is the status of the strategy development.

During the time of the assessment mission, the MTAES conducted a 3-day tabletop exercise (simulation of a large scale earthquake) with participation of

- heads of Communication Departments of all Ministries,
- heads of Communication Departments of all regions,
- international organizations, NGOs,
- all main gas, water, electricity, etc. providers,
- media and social media.

The objective of the exercise was to explore and identify potential needs and gaps (legal, procedural, technical, ICT, etc.) in crisis communication during emergencies.

The MTAES was the focal point Hyogo Framework for Action (HFA) and is the focal point for Sendai Framework for Action. In this capacity, the MTEAS played very active role in public awareness raising area. In 2013 and 2014, the MTAES organised two International Media Conferences and the outcomes of those

two Conferences were presented at the Sendai Conference. The third International Conference is scheduled for 15 - 16 December 2015.

The State Fire and Technical Safety Inspection, which is one of the divisions of the MTAES, plays, according to Law on Fire Safety, main role in fire prevention and awareness raising regarding the fire safety. At the HQ level, they have a department that is in charge for raising awareness of public in the area fire prevention. The department has approximately 15 persons and half of them are working in the area of public awareness raising. At the regional level, each head of the regional inspectorate has to publish articles and make TV statements to gradually increase the public awareness on urban and forest fires safety and prevention. They also conduct activities in schools and kindergartens, including development of materials and posters for schools, hospitals, hotels, public buildings, etc. Both levels (national and regional) have an annual plan for public awareness raising activities and regional organisations report once per month what they have done in this field.

The National Service for Seismic Protection, another division of the MTAES, conducts a wide spread of activities in form of the TV programmes, provision of information on website, publication of printed and electronic materials for various target groups. In addition, they organise trainings that focus on seismic protection behaviour and emergency evacuation during earthquakes in schools, hotels, pensions, etc. The subordinated State Non-Commercial Organisation cover public awareness raising activities at the regional level. The activities are based on annual plans and the SNCOs present reports to the National Service for Seismic Protection for approval every 3 months. SPS provides guidelines and recommendations and then approves them.

The Armenian State Hydro-Meteorological Service (one of the SNCOs) publishes bulletins and books about climate change. They are planning to prepare training for farmers on hydro-meteorological aspects of climate change and to deliver this training in three regions, however they do not have own budget available for this activity, so they are looking for a funding for this project from external donors.

The MTAES cooperates very closely with an NGO called Emergency Channel Information Centre, which has a very long tradition and deep experience in the area of crisis communication. The Emergency Channel Information Centre produces a number of disaster risk reduction (DRR) related TV and radio programmes, materials and trainings e.g. for fire fighters, police, medical doctors, etc. The trainings are focused on how to deal with mass media during emergency situations. They also organise trainings for journalists on how to work in emergency situations. “Emergency Channel” works very closely with a number of international partners e.g. UN, EU, NATO, NGOs, etc. and is very closely link to HFA and Sendai Framework for Action activities of the Republic of Armenia. The Emergency Channel Information Centre was actively involved in the activities of the PPRD East Phase 1 and produced a documentary film "Living with earthquakes” in order to share the Armenian experience of behaviour in case of earthquakes with the other Partner Countries and beyond.

The National Platform for Disaster Risk Reduction (ARNAP) provides horizontal platform for coordination of DRR related activities. One of the thematic groups working under the umbrella of the Platform is a thematic

group on awareness raising about disasters. The group is chaired by the MTAES and the members are: UNDP, ARC, OXFAM, Save the Children, Support to Communities and the World Vision. According to the assessment, the activities of the group are rather low.

At the municipal level, the Rescue Department of the City of Yerevan develops an annual plan for public awareness raising which contents theoretical and operational measures to be taken in "peace" time, like trainings and field exercises of different scale with the population, and informing population about the situation during emergency times. They have access to and they provide information to population via emergency newspapers issued every week and in case of a need through radio and TV channels.

The National Focal Point for Raising Awareness about Disasters (NFP) suggested the following points for consideration of the PPRD East 2:

- to enhance and strengthen communication capacities of communication services of civil protection/disaster risk management authorities of all Partner Countries,
- to organise a national table top simulation exercise in which all levels of crisis communication chain (from MTAES to the population) would take part and test crisis communication procedures,
- since the next meeting of Sendai WG on DRR public awareness raising will be hosted by Armenia in December 2015, the PPRD East 2 to consider how it can participate or support the event,
- the NFP offered himself as an expert for the exchange of experts with experts from other Partner Countries, including for a development of a guide book for "communication experts and journalists on how to write articles, materials on DRR for general public".

Institute of Geological Sciences of National Academy of Sciences suggested to consider and to discuss how to take into account and use the wide opportunities that ERRA provides for raising awareness about disasters.

10.3 Findings and Recommendations

Based on the feedbacks from the national interlocutors, it seems that the existing legal and institutional framework and system provide very good basis for the public awareness raising activities. Although the National Strategy for Awareness Raising about Disasters is under development, it was not possible to observe (during or after the assessment mission and during the writing of this document) what is the state of play of the strategy development, so the PPRD East 2 recommends to further explore what the situation is and to support the national authorities in the strategy development.

Based on the proposals from the NFP, the PPRD East 2 assessment team understood that one of the areas, which the PPRD East 2 may focus on, is the quality of crisis communication at all levels during emergencies. Instead of organising a separate table top exercise to practise and test this area, the PPRD East 2 proposes to use the Table Top Exercise 2 (TTX 2) which is planned as a part of Activity B in July 2017 and to enhance the focus of that exercise on the area of crisis communication.

10.4 Road Map

The road map proposes the prioritization of the recommendations, timeframe for their implementations and involved interlocutors.

Activity 1.1 – Meeting of the PPRD East 2 team and MTAES team drafting the National Strategy to discuss the state of play of the drafting and to identify areas in which the PPRD East can support the national effort

Responsibility: MTAES and PPRD East 2 Programme

Timeframe: by December 2015

Support: all national stakeholders participating in drafting of the National Strategy

Activity 1.2 – Development of "plan of actions" on how to support the Strategy development

Responsibility: MTAES and PPRD East 2 Programme

Timeframe: by March 2016

Support: all national stakeholders participating in drafting of the national strategy

Activity 1.3 – Support to the drafting of the strategy in line with "plan of actions" developed under point 1.2

Responsibility: MTAES and PPRD East 2 Programme

Timeframe: according to the "plan of actions"

Support: all national stakeholders participating in drafting of the national strategy

Activity 1.4 – Legal endorsement of the draft of the National Strategy for raising awareness about disasters

Responsibility: MTAES

Timeframe: according to the "plan of action"

Support: all national stakeholders participating in drafting of the national strategy and PPRD East 2

Activity 1.5 – Development of an action plan for the implementation of the National Strategy for raising awareness about disasters

Responsibility: MTAES and PPRD East 2 Programme

Timeframe: according to the action plan

Support: all national stakeholders in raising awareness about disasters

Activity 1.6 – Implementation of the National Strategy for raising awareness about disasters

Responsibility: MTAES and all national stakeholders active in raising awareness about disasters

Timeframe: according to the action plan

Support: PPRD East 2

Activity 2.1 – Planning meeting to discuss objectives, scenario and scale of the table-top exercise

Responsibility: MTAES and PPRD East 2 Programme

Timeframe: in line with the TTX 2 planning

Support: all national stakeholders active in disaster risk management (DRM) and raising awareness about disasters

Activity 2.2 – Preparation of the exercise plan, scenario, injects, etc.

Responsibility: MTAES and PPRD East 2 Programme

Timeframe: in line with the TTX 2 planning

Support: all national stakeholders active in DRM and raising awareness about disasters

Activity 2.3 – Execution of the TTX 2

Responsibility: MTAES and PPRD East 2 Programme

Timeframe: July 2017

Support: all national stakeholders active in DRM and raising awareness about disasters

11 Data and information sharing and INSPIRE Directive

Key Assessors	
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Chapter validated by	National Advisory Group

11.1 Legal and institutional framework

As of October 2015, EU INSPIRE directive has not been transposed in a national legislative system of the Republic of Armenia. The State Committee of the Real Property Cadastre (SCRPC), being in charge of collecting and archiving data on topographic mapping, cadastre and land registration is likely the most prominent stakeholders for this matter. Nonetheless, the Centre for Ecological-Noosphere Studies of the National Academy of Sciences of the Republic of Armenia (CENS), and the Institute for Informatics and Automation Problems of the National Academy of Sciences of the Republic of Armenia (IIAP) has participated to international initiatives for the development of an INSPIRE-compliant National Spatial Data Infrastructure (NSDI).

11.2 Current status of practices and area of excellence

In the following, the main national and international initiatives on the implementation of the INSPIRE directive are reported.

11.2.1 Tools for sustainable land management

The project led by the Norwegian Mapping Authority (Kartverket) has run in period October 2012- June 2015 having the SCRPC of the Government of Armenia as local partner. In the wake of Soviet Union colla pse, a nation-wide privatization campaign started and it is nowadays almost completed, nevertheless th e location of parcels boundaries is poorly documented. The overall objective of the project was to provid e access to geographic information for securing ownership, for land use planning and land management.

In addition, the project aimed at establishing a system for Internet-based access to property maps and o ther maps for planning and development, domestically as well as for a combination of geographic data a cross national borders; for environmental protection and response to disasters caused by natural hazard s, in compliance with the concept of NSDI and the EU INSPIRE Directive.

11.2.2 Deploying ARmenian distributed Processing capacities for Environmental GEOspatial data (ARPEGEO)

The ARPEGEO project was developed by Institute for Environmental Sciences at the University of Geneva (ISE)/GRID-Geneva, CENS, and IIAP. The objective of the project was to foster the capacities in managing processing, and sharing the geospatial data regarding the environment. To this end, 5 separate activities have been carried out, the first being the deployment of a standardized SDI in order to establish centralized efficient data management. A SDI has been set up at CENS and best-practices metadata standards (from the Open Geospatial Consortium: WMS, WFS and WCS[39]; from the International Organization for Standardization: ISO 19139 and ISO 19115) have been applied so as to make it fully compliant with Global Earth Observation System of Systems. Furthermore, a web portal of interoperable geo-processing services was developed to offer complex geo-processing capabilities. The ARPEGEO website provides a free-access URL for the geo-portal: http://gpu.grid.am:8080/dashboard. Nevertheless, it seems to be unreachable. It is noteworthy to underline that the project expired in 2013 so it is likely that the SDI is no longer maintained/available. The final step has been the feasibility study of the EGIDA methodology[40] aiming at scaling up the infrastructure to become a NSDI.

11.3 Findings and Recommendations

The current situation in Armenia regarding the implementation of EU INSPIRE directive can be summarized as follows

- policy level: no NSDI strategy has been developed yet, but some preparatory work and pilot projects have been carried out;
- legal framework: at the time of writing this report, Armenia had no legal basis for establishing a national SDI; and
- institutional level: for different projects, different institutions acted as coordination bodies (CENS and SCRPC).

The first recommendation concerns the **transposition of EU INSPIRE Directive into Armenian legal system**, since a legal reference to that is currently missing.

Secondly, it is recommended the **development of a NSDI strategy**, as a sustainable implementation path is needed by stakeholders to move from the current state of scattered and unconnected collections of spatial data to an integrated and harmonized infrastructure for sharing spatial data.

[39] *Web Map Services, Web Feature Services and Web Coverage Services*
[40] *EGIDA is the acronym for the "Coordinating Earth and Environmental cross-disciplinary projects to promote GEOSS", project co-funded by the European Union under the 7th Framework Programme*

To this end, it is recommended to set up of a **Steering Committee** composed by institutional and non-institutional subjects needed for the implementation of an effective NSDI and the sector-specific working groups. The Steering Committee is expected to provide guidance to development of a NSDI policy, coordination to the working groups and connection with responsible Governmental actors and decision makers. The Strategy developed by the Committee will address the timing of the tasks needed for the implementation. To be effectively beneficial, it is recommended that the Strategy will be able to involve in the process all the stakeholders and, at the same time, to ensure that the necessary resources are allocated on regular basis and are actually available.

Finally, besides the aforementioned drafting of legal framework, it is recommended to create a **public sector data sharing agreement** for data use with the objective of promoting the efficient collection, processing, exchange and sharing of spatial data.

11.4 Road Map

Topic	Recommendation	Who	How	When
Legal and institutional framework	Adoption of EU INSPIRE Directive into Armenian national legislative system	CENS/SCRPC	Drafting the necessary legislation	2016
Legal and institutional framework	Development of a NSDI strategy	CENS/SCRPC (coordinators)	Drafting of the necessary sub-legislation	2016
Legal and institutional framework	Set up regulatory bodies for the implementation (Steering Committee)	CENS/SCRPC (coordinators)	Drafting of the necessary sub-legislation	2016
Legal and institutional framework	Development of NSDI implementation working plan	Steering Committee	Establishing working groups	2016
Legal and institutional framework	Data sharing	Steering Committee	Drafting of a public sector data sharing agreement	2016
Technical implementation of	Metadata available for spatial data	Working groups	Application of NSDI implementation	2017

EU INSPIRE Directive	sets and services		working plan	
Technical implementation of EU INSPIRE Directive	Spatial data sets available for discovery and view from the NSDI geoportal (even for data not compliant with the IR-ISDSS[41])	Working groups	Application of NSDI implementation working plan	2017
Technical implementation of EU INSPIRE Directive	Spatial data sets available for download and transformation from the NSDI geo-portal (even for data not compliant with the IR-ISDSS2)	Working groups	Application of NSDI implementation working plan	2018
Technical implementation of EU INSPIRE Directive	Newly collected and extensively restructured spatial data sets conformant to IR-ISDSS (including metadata for interoperability) and available through network services	Working groups	Application of NSDI implementation working plan	2018
Technical implementation of EU INSPIRE Directive	All spatial data sets shall be conformant to IR-ISDSS (including metadata for interoperability)	Working groups	Application of NSDI implementation working plan	Mid 2018

[41] *Implementing Rules on interoperability of spatial data sets and services of the EU INSPIRE Directive*

	and available through network services			
Technical implementation of EU INSPIRE Directive	Invocable spatial data services related to newly collected and extensively restructured spatial data sets shall be conformant to Annexes V, VI and (where practicable) VII of IR-ISDSS (including metadata)	Working groups	Application of NSDI implementation working plan	2019
Technical implementation of EU INSPIRE Directive	All invocable spatial services shall be conformant to Annex V of IR-ISDSS (including metadata)	Working groups	Application of NSDI implementation working plan	2020
Technical implementation of EU INSPIRE Directive	All invocable spatial data services shall be conformant to Annexes VI and (where practicable) VII of IR-ISDSS (including metadata)	Working groups	Application of NSDI implementation working plan	2020

12 ERRA

Key Assessors	
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12.1 Institutional framework

Armenia has no specific legislation on NSDI or other legislation that norms the exchange of geospatial data and information between institutions that could be a reference for the ERRA platform.

There are two main institutions involved in the maintenance of the ERRA portal. The first one is obviously the MTAES that has duties both in emergency as well as when it comes to DRA. The second is the National Academy of Sciences, Institute of Geological Sciences that hosts a second public installation and that actively took part in the DRA study carried on in the PPRD East Phase 1. The Electronic Regional Risk Atlas in its current version is available at its dedicated website. The Institute of Geological Sciences examined and mapped not only the hazard layers for the main natural hazards in Armenia, but provided all information and analysis about the vulnerability assessment and the critical infrastructure analysis.

At the ERRA Regional Workshop (July 2015) Armenian delegation has communicated clear intentions to use ERRA as main thematic Geoportal regarding disasters and other related environmental information in Armenia. At the time of writing this report, no investments were foreseen in other tools or platforms. The ERRA platform is intended as a repository of Geospatial layers in a Geoportal fashion; maps and other information layers regarding disasters that constitute the information base for ERRA will be produced outside ERRA and then uploaded to the ERRA portal for consultation and sharing.

12.2 Current status of Installations and Use

Armenia has currently 2 installations of the ERRA platform. The first one is in the MTAES and is hosted by the virtual server in Germany. This installation needs to be migrated to the local server in the Ministry. The second one, in the Institute of Geological Sciences (IGS) of the National Academy of Sciences, is already running locally. No installation guide has been released in PPRD East Phase 1, so this hampered the migration of the platform to local installation. The final setup of the installation has already been completed in the two already identified locations, however a new debugged version will need to be installed by local ICT experts following the ERRA IT Installation Manual prepared within the PPRD East

Phase 2 with remote assistance from the PPRD East IT ERRA NKE. In this final installation the installation in the MTAES will be on a Private Network[42], while the one in the IGS will be on a public one[43] so to guarantee accessibility to selected layers in Armenia (both for institutions and the wider public) and with other institutions in the ENPI EAST region.

The use of ERRA has been discontinuous at MTAES, which logged in last time in April 2014, while the IGS uses ERRA in continuous fashion operating on the system in order to store layers produced by the Institute. The use of the platform was mainly to access domestic information rather than information from other countries.

Metadatation has not been properly tackled yet even if metadata of already produced layers has been consulted. The catalogue functionality in ERRA has been underexploited so far and open available web catalogues and services have never been linked to the platform.

The Q-GIS plug-in of ERRA has never been used also in light of the fact that Q-GIS is not used in Armenia; Arc-GIS is used instead. The Vulnerability and the Critical Asset Modules have not been used. The mobile app is not used so far, but it is considered an interesting feature.

12.3 Findings and Recommendations

1 – Installation

ERRA should be reachable outside the private network of MTAES and also should be used by other institutions involved in DRA. This is guaranteed by the public node in the IGS.

It is recommended to install locally the ERRA at MTAES and to properly mirror all information from the MTAES installation to the one installed at IGS, taking into consideration the sensitivity of certain layers especially when it comes to sharing at regional level.

2 – Use in Emergency and Strategic Planning

The main user identified so far is the CMNC Monitoring and Projections section of the MTAES that has disaster risk assessment as a main mandate. MTAES coordinates the DRA efforts while other institutions are mandated to perform the hazard assessment for each peril. As an example, Ministry of Agriculture and Ministry of Nature Protection are mandated for floods while the MTAES is mandated for landslides. MTAES fulfil this duty within their ordinary funds; additional funds can be triggered for reconstruction or mitigation purposes on the basis of the DRA findings.

It is recommended to include as ERRA users all institutions involved in DRA, both the ones producing information to develop a proper DRA and the ones benefiting from the DRA findings.

[42] *Private Network - a Network that does not expose a public IP, so that the network can be only reached by authorized users, so that sensitive information can be protected.*
[43] *Public Network - a Network exposing public IPs that can be reached by the wider public.*

3 - Mainstreaming with other National initiatives

ARNAP44 (the Armenia National Platform for Disaster Risk Reduction) is a non-governmental institution in Armenia and Armenia is one of the chosen countries to be financed for aligning its National DRR Strategy (Decree 281/2012 "on approval of the Disaster Risk Reduction National Strategy of the Republic of Armenia and the action plan for the implementation of the Disaster Risk Reduction National Strategy") to the Sendai Framework by UNDP. Understanding Risk, supported by an appropriate DRA, is one of the priorities of the Sendai Framework as well as of the National DRR Strategy in Armenia under implementation.

World Bank and MTAES are implementing the programme: "Programmatic Approach for the Armenia National Disaster Risk Management Program ". On of the main pillar of the programme is to support the Sharing and developing of risk information. Specifically, this activity will include the establishment of Geonode (open geospatial data platform for disaster risk information) to compile existing disaster risk information.

It is recommended to use ERRA as a supporting tool to the DRR National Strategy and, in the near future, for the reporting to the Sendai Framework, as also supported by the EU.

It is further recommended to clarify the interconnection between ERRA and Geonode (that will be established by projects "Programmatic Approach for the Armenia National Disaster Risk Management Program"); since both systems are similar in nature and ERRA contains most of the functionalities, it is recommended to adopt ERRA as national system for collecting, recording, processing and sharing disaster risk information.

4 - Support of DLD Collection and visualization

Disaster loss data are perceived as a real added value to ERRA. Armenia has a Disaster Loss Database maintained by MTAES since 1991 in electronic format.

It is recommended to include such database in ERRA and to develop a DLD module for ERRA that can help collection and storage of disaster loss data in the future as well as ease the completion of an accessible National Database on Disaster Losses.

5 - Data sharing inside Armenia

Although Armenian institutions are well aware of the importance of data sharing in the context of DRM, there is still a poorly coordinated strategy of data sharing at national level, especially to the wider public.

It is recommended to define a Data Sharing Policy that includes rules for the information sharing, especially with the wider public.

[44] *ARNAP is a non-governmental institution founded by the RA Government contributing to the DRR initiatives at every level in Armenia.*

6 - Data sharing in the ENPI East Region

In terms of data sharing policies some issues are present with Azerbaijan due to the delicate situation in the region, however there are no issues in sharing information with other countries in the. In general Armenia is available to cooperate and share methodologies with every Partner Country.

It is recommended to start with sharing methodologies about Disaster Risk Assessment and as a second step to define a proper policy of data exchange with neighbouring countries taking fully into account existing bi-lateral relationships with Georgia and Azerbaijan.

12.4 Road Map

Topic	Recommendation	Who	How	When
Installation	Obtain installation stability with a private and a synergic public node	MTAES in coordination with IGS	Installing the system locally at MTAES with the support of the ERRA IT expert and synchronize (partially) the two installations	2015
Use in Emergency and Strategic Planning	Expanding the portfolio of reference users for ERRA	MTAES in coordination with IGS and in consultation with all institutions involved	MTAES to identify the reference institutions in DRA and establish a WG on the ERRA use cases definition; ERRA training for the other institutions involved in DRA identified by MTAES[45]	2016

[45] *ERRA Training - basic training on the use of ERRA describing also its characteristics and potentialities, so that other institutions apart from MTAES and IGS will start using the tool.*

Mainstreaming with other national initiatives	Interconnection between ERRA and Geonode	MTAES	Clarify the interconnection among ERRA and Geonode and adopt ERRA as national system for disaster risk information collection, recording, processing and sharing	2016
Mainstreaming with other national initiatives	ERRA to become a supporting tool of the National DRR Strategy	MTAES in coordination with ARNAP	Establishing a working group on ERRA within the ARNAP activities to draft a road map of inclusion of ERRA as a supporting tool of the National DRR Strategy	2016
Support of DLD collection and visualization	Development of ERRA DLD Module	MTAES in coordination with IGS	Establishing a technical working group for the uptake of the existing DB	2016
Support of DLD Collection and visualization	Development of ERRA DLD Module	MTAES in coordination with IGS	Inclusion of the Disaster Loss DB into ERRA (PPRD East Phase 2 expert will support the implementation of this task)	2016
Data sharing inside	Definition of rules	MTAES	Establishing a	2016 - 2017

Armenia	for the information sharing, especially with the wider public	(coordinator)	working group including all the stakeholders	
Data sharing in the ENPI East Region	Clarify the type of information and the level of aggregation for the data sharing	MTAES	Establishing a working group including all the stakeholders	2016 - 2017

13 Annexes

Annex 1 - HNS SOP template

Annex 2 – List of Interlocutors