ANALYSIS OF LEGAL AND REGULATORY FRAMEWORK FOR DISASTER RISK KNOWLEDGE COMPONENT OF MULTI-HAZARD EARLY WARNING SYSTEM IN GEORGIA

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Reducing the Risk of Climate-driven Disasters

Project:
Strengthening the Climate Adaptation Capacities in Georgia

Based on Disaster Risk Knowledge Component under the WMO Checklist for Multi-hazard Early Warning Systems

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Prepared by a team of international and national experts with assistance from the United Nations Development Programme (UNDP), Green Climate Fund (GCF) and the governments of Georgia, Sweden and Switzerland.

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ABBREVIATIONS

CI	Critical Infrastructure
DRR	Disaster Risk Reduction
MHDRIS	Multi-Hazard Disaster Risk Information System
MHEWS	Multi-Hazard Early Warning System
WMO	World Meteorological Organization
EMS	Emergency Management Service
LEPL	Legal Entity Under Public Law
EUAA	Association Agreement between the European Union and the European Atomic Energy Community and their Member States, of the one part, and Georgia, of the other part (2014)
GoG	Government of Georgia
SDC	Swiss Agency for Development and Cooperation
TTWG	Thematic Technical Working Group on Risk Knowledge Management
NPSS	National Public Safety System
NEA	National Environmental Agency
NSC	National Security Council
MEPA	Ministry of Environmental Protection and Agriculture
MIA	Ministry of Internal Affairs
NSDI	National Spatial Data Infrastructure
NAPR	National Agency of Public Registry under the Ministry of Justice
NEAP	National Environmental Action Program

EXECUTIVE SUMMARY

The Analysis of Legal and Regulatory Framework for Disaster Risk Knowledge Component of Multi-Hazard Early Warning System (MHEWS) in Georgia was commissioned by UNDP project "Strengthening the Climate Adaptation Capacities in Georgia", funded by the SDC. The project represents one of the three interrelated initiatives, implemented by the UNDP for assisting the Government of Georgia in developing of a well-functioning nationwide multi-hazard early warning system and risk-informed local actions.

The objective of the presented analysis is to examine the current legal framework and institutional arrangements for disaster risk knowledge component of the multi-hazard early warning system in Georgia, to identify gaps, and to recommend changes to the existing legislation. The legal and regulatory analysis was performed based on the WMO MHEWS checklist[1] that was developed by the partners of the International Network for Multi-hazard Early Warning Systems. The checklist, which is structured around the four key components (one of which being the Disaster Risk Knowledge) of Early Warning Systems, includes the main criteria and actions to which national governments, community organizations and partners within and across all sectors can refer when developing or evaluating early warning systems. The presented analyses make use of the checklist and are organized according to the 5 criteria of the Disaster Risk Knowledge specific WMO checklist:

(1) Identification of key hazards and related threats
(2) Assessment of exposure, vulnerabilities, capacities, and risks
(3) Roles and responsibilities of stakeholders
(4) Consolidation of risk information
(5) Incorporation of risk information into the early warning system.

The legal dimension of each criterion is discussed separately, in the specific chapter of the analysis and includes description of the identified gaps and recommended actions for improvement.

The key findings of the analysis and the respective recommendations could be summarized as follow:
Current legal framework in Georgia does not clearly establish rules, methodologies, and institutional arrangements for the management of disaster risk knowledge. Legislative gaps and needs for improvement have been identified related to all the above-mentioned components of risk knowledge management. In order to address those gaps, the revisions and additions to the existing principal and subsidiary legislation as well as the development of new technical regulations and the related adjustments to the existing legal requirements are recommended. **More specifically, the proposed legal interventions could be presented in three groups:**

1 Multi-hazard Early Warning System: Checklist: https://library.wmo.int/doc_num.php?explnum_id=4463

(1) **Development of Disaster Risk Information through elaboration of the Technical Regulations on the risk assessment for specific hazards.**
(2) **Consolidation of disaster risk information through elaboration of technical regulation on disaster risk data standardization and disaster risk data management.**
(3) **Incorporation of disaster risk information into existing legislation through amendments in the existing legislation in order to introduce specific legal requirements and to enable implementation of the new regulations to ensure risk-informed development.**

Recommendation 1. Technical Regulations on the Risk Assessment of the specific hazards (floods, droughts, avalanches, windstorms, hailstorms, landslides, and mudflows) and of multi-hazards

Currently there is no unified methodology and related legal framework for identification, assessment, modelling, mapping, of the risks from natural hazards (including multi-hazards) in Georgia.

- It is recommended to develop Technical Regulations on Disaster Risk Assessment for specific hazards (including multi-hazard) that will enclose methodological requirements and standards for hazard identification, assessment, mapping, and modelling, as well as the related risk and socio-economic vulnerability assessment and risk mapping
- The Technical Regulations should identify roles and responsibilities of the parties involved in risk assessment, modelling, and mapping

Recommendation 2. Technical Regulation on standardization and management of disaster risk data

For the purpose of development of National Spatial Data Infrastructure (NSDI) system based on principles of harmonization and interoperability, it is important to ensure that the hazard and risk data is compatible with other data within the system. Therefore:

- It is recommended to develop Technical Regulation for hazard and risk data preparation and sharing, so the data is being produced using the legally established harmonized standards and methodologies.
- To enable possibility of consolidation and storage of risk information (including geographic information system) and data related to hazards, exposures, vulnerabilities in the central standardized repository, it is mandatory to take into account the aspect of cross-sectorial integration of the information at the stage of collection of the differentiated data. It is necessary to establish national standards for the systematic collection, sharing and assessment of information and data to be stored in the repository. It is recommended to adopt standards for interoperability and metadata, as well as to revise the organizational framework in the area of the data exchange (hazards, meteorology, hydrology, topography, soil characteristics, vegetation, settlements, existing infrastructure, population, and available socio-economic and material resources, as well as disaster risk assessment, vulnerability assessment, etc..)
- The results of the risk assessment (including vulnerability assessment) should be presented in a way to

be comparable for using on different levels and for differentiated purposes. It should also contribute to the centralized general vulnerability database.

- It is also recommended to introduce national standards for geospatial data and maps, including hazard data and maps and to align hazard data and maps with those standards and linking climate-induced hazard data and maps with a common, unique Geospatial Portal.
- The elaborated Technical Regulation should establish cooperation of the responsible parties in data sharing.
- Also, in order to create enabling institutional environment for the implementation of such regulations, relevant changes should be made to the statutes of responsible entities (NEA, EMS, other entities who are obliged to collect data).
- The sharing of the data across designated institutions should be supported by the introduction of appropriate data sharing protocols.

Recommendation 3. Incorporation of risk information into the existing legislation

In order to ensure risk-informed development of specific sectors, proper reflection of disaster risk reduction elements, including prevention, mandatory identification of risks in the sectorial development plans need to be improved and enforcement mechanisms need to be refined. More specifically:

- The legislative framework governing spatial and land use planning in Georgia needs to be revised in order to clear define requirements for incorporation hazard identification and related risk and vulnerability assessment. The Spatial Planning, Architectural and Construction Code of Georgia should include provisions, requiring combination of the information on hazards (NEA's responsibility) with the information on Risk (EMS' responsibility) and using it as an input to the development of spatial, urban, and other plans. Based on this information (provided in the form of data, maps, and models), the areas of different levels of risk should be identified and certain restrictions in high-risk areas should be established. The risk-zoning maps should be used as indicatory maps, based on which, for specific activity in a certain zone additional research and assessments would be required based on the local and other specifications. This should ensure protection from hazards already within the planning process.
- The respective changes should be introduced to the statutes of NEA and EMS in order to facilitate cooperation and involvement in the spatial and land use planning.
- Governmental Resolution Nr. 260 "on approval rules of preparation of spatial and urban development plans", that represents guiding document for development and approval of spatial and land use plans, should be updated. As the Resolution requests the preliminary research to be conducted and specifies its content and structure, it should include the definitive list of hazards to be taken into consideration. Annex IV of the Resolution should be enriched with details on hazards, risks, and vulnerability assessment, including maps and models. The detailed information on the specifics of hazard risk maps/ risk assessment plans and on the baseline data the maps/plans to be founded, should be included.

The provision of mentioned data should be obligatory, and not "recommended" as it is now. The responsibilities of involved stakeholders should be defined, and respective mandates granted.

- It is recommended to define the procedure of reviewing draft spatial and land use plans from the point of identification of natural hazards and assessment of risks. The responsibilities of relevant institutions should be specified accordingly.
- The procedure of review the draft spatial and land use plans should be also connected to the strategic environmental assessment (SEA). The Expert Commission, established by MEPA should include relevant experts, to be able to ensure that hazard and disaster risk assessment considerations are well represented within the plans. For this purpose, the development and approval of guiding manual/ checklist might be an option.
- Additional recommendations provided in the document are related to elaboration and renewal of the emergency risk management plans, "critical infrastructure", functions and responsibilities related to the multi-hazard risk assessment, etc.

1. INTRODUCTION

UNDP is assisting the Government of Georgia in the implementation of a program for reducing exposure of Georgia's communities, livelihoods, and infrastructure to climate-induced natural hazards, through the implementation of a well-functioning nationwide multi-hazard early warning system and risk-informed local actions. The program encompasses three interrelated projects funded by Green Climate Fund (GCF), Swiss Development Cooperation (SDC) and Swedish Government (SIDA). The GCF funded interventions are targeting expansion of the hydrometeorological network & modelling capacities and improving community resilience through implementation of MHEWS & risk reduction measures; SIDA project contributes to the public awareness raising and structural measure components. The SDC project "Strengthening the Climate Adaptation Capacities in Georgia" is enhancing Georgia's disaster risk reduction capacities focusing on development and implementation of unified hazard and risk modelling and mapping methodologies which will provide the multi-hazard risk information, enhancement of the DRM methods and central and municipal levels, and enhancement of the MHEWS, CCA and DRM regulatory frameworks.

Hence, under the SDC project the analysis of legal and regulatory framework for multi-hazard early warning system in Georgia has been undertaken for each of the four components of MHEWS (Disaster Risk Knowledge, Monitoring, Forecasting and Early Warning, Dissemination and Communication and Preparedness and Response). The objective of the analysis is to review and analyse the current legal framework and institutional arrangements for MHEWS in Georgia, to identify gaps, and to recommend changes to the existing legislation. The analysis revealed that improvement of legal and institutional frameworks is required for a fully functioning multi-hazard early warning system. Such enhancements will be realized by provision of technical assistance and expertise in development/amendment of regulatory frameworks.

This document presents the analysis for the Disaster Risk Knowledge component of the WMO MHEWS checklist[2] and examines the existing legal and regulatory framework based on the topics included under the specific checklist of this component.

2 Multi-hazard Early Warning System: Checklist: https://library.wmo.int/doc_num.php?explnum_id=4463

2. SCOPE OF THE ANALYSIS, METHODOLOGY AND SOURCES

This document is heavily based on the desk review of the reports prepared by the team of legal experts under the UNDP program. The existing reports, related to situation analysis of Disaster Risk Knowledge components of the MHEWS were collected, compiled, and updated. The findings from the previous reports supplemented by the additional legislative and regulatory review are combined and grouped in accordance with the 5 criteria of the Disaster Risk Knowledge component specific WMO checklist (the detailed description follows in the relevant chapter below).

The criteria of the Disaster Risk Knowledge specific WMO checklist are:

1. Identification of key hazards and related threats.
2. Assessment of exposure, vulnerabilities, capacities, and risks.
3. Roles and responsibilities of stakeholders.
4. Consolidation of risk information.
5. Incorporation of risk information into the early warning system.

The following research methods where employed: The desk reviews were conducted by consulting Georgian legal sources to assess existing legal conditions, by documentary review of related and supporting documents (policies, strategies of national level with some examples from local level, third party assessments, draft laws, materials published by respective state agencies etc.), and by collection, in-depth review and content analysis of related legislative acts of different levels containing national laws and policies (relevant parts), secondary legislation e.g. technical regulations, charters of institutions describing their roles and responsibilities, and guideline documents. The relevant stakeholders were identified, including representatives of governmental institutions in charge of MHEWS and civil society, in order to reflect their positions, ensure contribution in data provision and to encourage active and meaningful participation in the assessment, identification of existing gaps and in the formulation of recommendations. The Thematic Technical Working Group was established, and the draft report was presented for validation and for soliciting comments from the TTWG.

Considering the fact that the program focuses on 7 hydrometeorological and geological hazards (floods, droughts, avalanches, windstorms, hailstorms, landslides, and mudflows) the emphasis was given to the in-depth analysis of the responsibilities and regulatory documents related to MHEWS for those hazards. The compliance review and gap analysis of the Georgian legislative and regulatory framework were conducted vis-à-vis above presented five criteria from the Disaster Risk Knowledge specific WMO checklist (2018).

3. COUNTRY BACKGROUND

Georgia is situated in the southeast part of Europe, in the Caucasus, at the transit crossroad between Europe and Asia. The country borders Russian Federation from the north, Turkey, and Armenia from the south, Azerbaijan from the southeast and the Black Sea from the west. Total area of Georgia is 69,700 km^2 (without territorial waters). Georgia's agricultural land, including pastures, covers 3 025 800 ha (43.4% of the area), while 40% of land is covered by forest and other 16.6% by land use areas (inland waters, populated areas, etc.). Because of the mountainous terrain, much of the agricultural land is pastureland and pasture. Arable land - which is fertile, accounts for about one-quarter of all agricultural land.[3] Georgia is characterized by a variety of topography, a system of mountains of different height cross the country's territory. Around 95–98% of Georgian forests are natural and about 98% are located on the slopes of the Greater and Smaller Caucasus Mountain ranges. Forests are highly diverse due to the country's nine climatic zones, ranging from humid subtropical to everlasting snow. Because most of forests are mountainous, they play an essential role in water regulation and soil protection. Unsustainable exploitation of forest often leads to erosion, increased risk of flooding and water shortage.[4]

Georgia, as a part of the Caucasus eco-region, is recognized to be one of the special places in terms of biological diversity – a biodiversity hotspot. Its nature is distinguished with diverse varieties, high number of endemic species and ecosystems of global significance. According to 2020 data, total area of the protected areas in Georgia is 793,351 hectares (including Abkhazia A/R and Tskhinvali region), which is 11,38% of total territory. There are 93 protected areas of different IUCN categories in Georgia, among them 14 Strict Nature Reserves, 13 National Parks, 40 Natural Monuments, 23 Managed Nature Reserves, and 3 Protected landscapes.[5]

Population of Georgia is 3,728.6 thousand people, 41.7% of which (1,512.9 thousand people) lives in rural areas.[6] According to the forecast of the UN World Urbanization Prospects, the share of rural population in Georgia will decrease up to 27% by 2050. Population density per square kilometre is 65.2 people that are distributed unequally with the ratio higher in the cities and lower in rural settlements.[7]

Over the past 20 years Georgia has made impressive strides in economic growth and poverty alleviation. Georgia's economy grew at an average of 5.4 percent of GDP annually, with foreign investment and domestic

3 National Report on the State of the Environment of Georgia (2014-2017) 2019, Chapter 4.3 Land Resources of Georgia, available at: https://mepa.gov.ge/En/Reports

4 Third National Environmental Action Programme of Georgia (2017-2021) http://extwprlegs1.fao.org/docs/pdf/geo180258.pdf

5 Agency of Protected Areas of Georgia, official website: https://apa.gov.ge/en

6 National Statistics Office of Georgia, official website: https://www.geostat.ge/en/modules/categories/41/population

7 Agriculture and rural development strategy of Georgia (2021-2027) available at: https://mepa.gov.ge/En/PublicInformation/6346

demand both playing a prominent role. In 2019, Georgia transitioned from a lower-middle income country to an upper-middle income country. Despite economic growth, the country's population remains vulnerable to economic, social, and environmental shocks. Substantial reductions in poverty have been achieved since 2010, but a significant share of households may fall back into poverty as a consequence of the COVID-19-induced economic crisis.[8] According to the official statistics of 2020, 21.3% of the population of Georgia is below the absolute poverty line.[9]

Due to difficult terrain, geological and climatic conditions, natural disasters in Georgia are large-scale, repetitive - frequent and the risk of danger - high. In recent years, there has been an increase in their number, which is due to both climate change and human impact. Natural disasters pose a high threat to the country's population, infrastructure, and economy[10].

The settlements and municipalities in Georgia are placed under four categories of hazard risks: non-dangerous, low, medium, and high[11]. The increasing trend of the intensity and frequency of hydro-meteorological and geological phenomena due to climate change has been observed worldwide, including in Georgia[12], and is exacerbated by human activities, such as deforestation, overgrazing of pastures, etc. The frequent natural disasters caused or intensified by the climate change phenomena in the country are landslides, mudflows, floods, flash floods, droughts, hailstorms, forest fires, avalanches, and strong winds, which result in substantial economic losses for Georgia including damages of arable land, infrastructure, and threat to people's lives.

3.1 Hydrometeorological and Geological Hazards

Georgia is one of the more complex mountainous regions living through the development of natural disasters, in which multi-spectral natural hazards are distinguished by their high recurrence rates and negative consequences for the population and infrastructure, as well as high rates of land resource losses and economic damage. Among the different types of natural disasters that periodically cause significant damage to the country's economy and often cause human casualties, the most important are landslides, floods, mudflows and associated flash floods, avalanches, droughts, hailstorms, and windstorms. Almost all morphological-climatic zones, starting with the sea coastline up to the high-altitude mountain alpine-nival[13] zone, have experienced damage to different extents. Over 50,000 landslides of different sizes and over

8 World Bank. 2020. Georgia: Towards Green and Resilient Growth

9 National Statistics Office of Georgia, official website: https://www.geostat.ge/ka/modules/categories/192/tskhovrebis-done

10 The National Environment Agency, official website https://nea.gov.ge/En/popular/7

11 Third National Environmental Action Programme of Georgia (2017-2021) available at: http://extwprlegs1.fao.org/docs/pdf/geo180258.pdf

12 Georgia's Second Biennial Update Report Under the United Nations Framework Convention on Climate Change, 2019

13 The alpine–nival ecotone is the transition between the lower located alpine grassland/tundra zone and the upper located sparsely vegetated nival zone in the mountains. Source: Gottfried, M & Hantel, M. & Maurer, C & Toechterle, R & Pauli, Harald & Grabherr, G. (2011). Coincidence of the alpine–nival ecotone with the summer snowline. Environmental Research Letters. 6. 014013. 10.1088/1748-9326/6/1/014013.

3,000 mudflow-transforming watercourses (rivers, canyons) have been identified in the country, as well as hundreds of kilometres of eroded riverbanks and coastline. Up to 70% of the territory and around 63% of the population are permanently at risk of natural disasters of different intensities. Since the 1970s, over 60,000 families have been assigned a status of eco-migrants and moved from their living places to safer areas. Over 400,000 residential houses and infrastructure units have been registered as damaged to different extents and as being situated in hazardous areas. A total of 1.5 million ha of agricultural lands were damaged and are no longer available for agricultural use. Geological disasters caused over 1,000 casualties, including 140 casualties in 1995-2015. Total damage was estimated at over $15 billion[14].

Landslides, debris flow, falling rocks and mudflows are considered major geological hazards, while floods, flash floods, hail, avalanches, and droughts are qualified as the most frequent natural hydrometeorological phenomena in Georgia. According to the information provided in the Third National Environmental Action Programme of Georgia (2017-2021)[15], landslides are frequently associated with significant economic loss, and in some cases, they even cause human death in Georgia. Landslides damage buildings, agricultural lands, roads, and other infrastructure. As for debris/mudflows, due to the extremely sensitive geological conditions in Georgia, they take place in almost all mountainous river basins. More than 3,000 water bodies, transformed by debris/mudflows, have been recorded in Georgia and the total area of these river basins amount to more than 22% of the country. Falling rocks and rock avalanches are also frequent in Georgia due to its complex landscape. 50% of the country's territory is characterized by more than 200 inclines, and slopes are mainly built on rocky and semi-rocky layers. Therefore, active gravitational processes - falling and rock avalanche, are observed almost everywhere. Such processes are particularly intensive during the winter and spring seasons, and the population and infrastructure in the mountainous regions, are always within the risk zone. Earthquakes trigger the rock avalanches and other geological processes (e.g., earthquakes in Racha-Imereti (1991), Pasanauri-Barisakho (1992), Tbilisi (2002), Oni (2009) and Vani (2010)

Within the hydrometeorological processes, floods, flash floods, hail, strong winds, snow avalanches and droughts are among the most damaging natural hazards in Georgia. Floods and flash floods are typical for all rivers in Georgia. An especially high risk of floods and flash floods is observed in the river basins of Imereti, Samegrelo, Guria, the Mtskheta-Mtianeti regions, as well as the nearby territories of the Mtkvari River and the left bank of the Alazani River. In 1968 and 1987, floods and flash floods destroyed more than 400 houses, 1, 500 agricultural facilities and 16 km of railway. 80, 000 ha of agricultural lands were also lost or damaged. In 2015, the flash flood in the Vere River basin accompanied by landslide, debris/mudflow, and other natural events, took more than 20 human lives and caused significant economic damage. Avalanches are typical for the mountainous regions of Georgia. A high frequency of avalanche was observed in 1970-2005. Around 176 human lives were lost and more than 20, 000 people had to resettle.

14 The National Association of Local Authorities of Georgia (NALAG) The Georgian Road Map on Climate Change Adaptation, 2016

15 Third National Environmental Action Programme of Georgia (2017-2021) available at: http://extwprlegs1.fao.org/docs/pdf/geo180258.pdf

Hail is observed on the whole territory of Georgia. Its intensity and frequency are higher in eastern Georgia. However, in 1997, the hail dramatically affected not only the eastern part of the country, but also the Oni, Ambrolauri, Adigeni and Zestaphoni regions. During this period, agricultural crops and harvests were lost, house roofs and vehicles were damaged and poultry and domestic animals were killed. The economic damage exceeded GEL 35 million.
Drought is most common in Shida Kartli, Kvemo Kartli Kakheti, Samtskhe-Trialeti and the Zemo Imereti regions, but also takes place throughout the whole territory of Georgia. For example, in 2000, drought was observed on more than 50% of the territory of Georgia and lasted 7 months. The damage exceeded GEL 300 million.

Strong west and east winds prevail throughout the year on the territory of the country, which is conditioned by the terrain and the direction of the mountain ridges. Wind direction varies seasonally, thus, in Western Georgia, east winds prevail in winter, and west winds - in summer, and in Eastern Georgia, west winds prevail over east winds. Strong winds cause damage to infrastructure and agriculture. The frequency of recurrence of strong winds has increased. According to the Fourth National Communication of Georgia under the UNFCCC (2021)[16], rising temperatures, increased winds and reduced water availability have significantly declined agricultural productivity.

3.2 Disaster Risk Governance

The institutional structure of DRR in Georgia is quite complex and incorporates a considerably high number of organizations and stakeholders, making overall coordination challenging. While identification, monitoring, analysis, and forecasting of natural hazards seem to be well established and clearly structured among the National Environment Agency (NEA) departments by dominant hazard type, other components have been covered only recently or the institutional coverage is currently under design.

National Security Council (NSC) is the highest state security and crisis management body subordinated to the Prime Minister (PM). Besides having consultative role to the PM, the NSC is responsible for proposing preventive and response measures to threats of national importance. It is also responsible for organizing and coordinating the development of national level concept documents[17] (such as the Threat Assessment Document of Georgia).

Ministry of Internal Affairs (MIA) runs Emergency Management Service (EMS). The EMS coordinates and monitors the implementation of the state policy in the field of public safety and carries out the National Public Safety Plan. The EMS also identifies, analyses, and assesses risks on the permanent basis, plans and implements preventive measures and projects in cooperation with bodies of the public authorities. The

16 Fourth National Communication of Georgia under the United Nations Framework Convention on Climate Change, 2021 available at: https://unfccc.int/sites/default/files/resource/4%20Final%20Report%20-%20English%202020%2030.03_0.pdf

17 The Law of Georgia on National Security Policy Planning and Coordination, 2015 available at: https://matsne.gov.ge/ka/document/view/2764463?impose=translateEn&publication=2

EMS organizes the creation and development of an early warning system for expected or actual emergency situations, collects and processes necessary data within the system. MIA also runs Public Safety Management Centre – 112 which is responsible for receiving information on emergencies, for processing this information and for providing it to the relevant entities to ensure an efficient response.

The Ministry of Environmental Protection and Agriculture (MEPA) runs National Environmental Agency (NEA). NEA is responsible for monitoring and assessment of various geophysical natural hazards (geological (except of earthquakes), hydrological and meteorological). The hazards are identified at the national level but also at the level of districts. NEA provides the information to the National Security Council and all stakeholders including EMS through geographical bulletins that are disseminated monthly. NEA also provides hazard maps and recommendations.

Seismic Monitoring Center of the Ilia State University in cooperation with Geophysical Institute of the Georgian Academy of Sciences is responsible for monitoring and assessing earthquake hazards.

Disaster risk management, response, recovery, and awareness raising on municipal level falls within the competence of Local Governments and is coordinated by the EMS, which is also responsible for approving municipal disaster risk management plans; unified guidelines for preparing these documents and taking actions on regional level. EMS centres have been established in each major city and according to the system upgrade, due to be completed by the end of 2022, there shall be one regional EMS in each of 12 Georgian districts responsible for DRR coordination and communication. Each regional EMS shall be connected to the central digital system with DRR information. Currently, there is no regular system of early warnings in place, therefore, only ad hoc solutions were realized when necessary. Since 2018, emergency management plans have been obligatory for each municipality.

4. GENDER IN DRR

4.1 Gender Equality in Georgia

Gender equality refers to the equal rights, responsibilities and opportunities of women and men and girls and boys.... and opportunities will not depend on whether they are born male or female. Gender equality implies that the interests, needs and priorities of both women and men are taken into consideration, recognizing the diversity of different groups of women and men. Gender equality is not a women's issue but should concern and fully engage men as well as women. Equality between women and men is seen both as a human rights issue and as a precondition for, and indicator of, sustainable people-centred development[18]. Gender mainstreaming involves ensuring that gender perspectives and attention to the goal of gender equality are central to all activities – policy development, research, advocacy/dialogue, legislation, resource allocation, and planning, implementation and monitoring of programmes and projects[19]. Hence a goal of gender equality is the participation of both men and women in all spheres of social life as well as equal distribution of services and financial resources, eradication of any forms of discrimination and creation of equal opportunities in employment.

Men and women in Georgia have equal rights spelled out in the Constitution and the laws, but in reality equality is far from being reached. In a traditional society to which Georgia belongs, women and men have different opportunities and positions in society, men and their rights being dominant. Reasons for this are found in the prevailing traditional social structure of the society: Traditional roles, gender-related stereotypes, and low awareness and understanding of the importance of gender equality[20].

For guiding the society towards achieving gender equality, Georgia has been actively working on the issue during last decades. The efforts include ratifications of international instruments, adoption of national legislation ensuring gender equality, design, and implementation of Action Plans. The international conventions and resolutions played a key role in developing the Georgian legislature and actual mechanisms for ensuring gender equality in the country. By the adoption of two main international documents: Beijing Declaration and Platform for Action and Convention on the Elimination of All Forms of Discrimination against Women (CEDAW, 1994), Georgia took an obligation to formulate state policy on gender equality and thus ensure progress in achieving gender equality in all spheres of societal life. Government of Georgia is required to submit national reports to the CEDAW Committee, at least every four years, on measures, which have been taken to put the provisions of the treaty into practice. Furthermore, in addition to the national report, the CEDAW Committee receives the so-called Shadow Report prepared by the NGO sector. Based on these reports, the Committee drafts recommendations and sends them to the government of Georgia.

18 UN Women, concepts and definitions, available at: https://www.un.org/womenwatch/osagi/conceptsandefinitions.htm

19 Gender Mainstreaming: Strategy for Promoting Gender Equality, 2001, available at: https://www.un.org/womenwatch/osagi/pdf/factsheet1.pdf

20 Gender Mainstreaming - a Practical Guide for Public Servants, 2014 available at: https://georgia.unwomen.org/en/digital-library/publications/2014/01/gender-mainstreaming

The Beijing Declaration and Platform for Action approved in September 1995 at the Fourth World Conference on Women in Beijing, states a global commitment to achieving equality, development, and peace for women worldwide. The Declaration and Platform for Action lists women and the environment as one of its priority areas, stressing the importance of healthy and productive life in harmony with nature. The document points out that women can play an important role in the development of ecologically sound consumption and production patterns and approaches to natural resource management; Women have to take part in elaboration of the environmental monitoring system. The document underlines the importance of women's participation at all levels of the policy formulation and decision-making in natural resource and environmental management, conversation, protection, and rehabilitation processes.

4.2 Gender Mainstreaming in DRR

Women's important role in risk management and in developing gender-sensitive disaster risk reduction policies has been underlined in Sendai Framework adopted at the third UN World Conference on Disaster Risk Reduction in Sendai, Japan in 2015 *"Women and their participation are critical to effectively managing disaster risk and designing, resourcing and implementing gender-sensitive disaster risk reduction policies, plans and programmes; and adequate capacity building measures need to be taken to empower women for preparedness as well as to build their capacity to secure alternate means of livelihood in post-disaster situations".*

In Georgia since 1998, the National Plans of Action (NAP) for gender equality were elaborated and time to time were extended. The Government of Georgia adopted 2014-2020 Human Rights Strategy and Action Plan. The aim of the strategy is to develop a systematic approach to the realization of human rights by all Georgian citizens. The last Governmental Action Plan on Human Rights (2018-2020) includes a separate chapter (chapter 12) about Women's Right and Gender Equality. It discusses the following goals: gender equality and women's empowerment, women's empowerment in economy, gender equality in healthcare, education, culture, and sports, fight against harmful practices against young girls and women. The Strategy does not discuss gender equality issues in the disaster risk management, environmental and nature resource management sphere. Only in the final part of the document it addresses the rights of the families displaced as a result of natural disasters, but still says nothing about women's needs and problems related to natural disasters.

The Constitution of Georgia, Law on Gender equality (2010) and Antidiscrimination Law of Georgia (2014) are considered as main legal documents covering gender equality issues. Laws, by-laws, and strategic documents in the field of environmental protection and natural resources do not recognize the special importance to protect women's rights or to ensure the equal participation of men and women in the environmental-related issues[21]. However, the 2017-2020 National Disaster Risk Reduction Strategy and its Action Plan envisages ensuring gender equality in the disaster risk reduction policy by considering the special needs of women. Article 3.12. Gender Equality in the Disaster Risk Reduction Policy mentions: *"Taking into account that women, especially during pregnancy, belong to a group of the population, which is more vulnerable to disasters, their participation at all stages of the disaster management system is very important. Specific needs of women*

21 Women's Fund in Georgia, 2017 Situational Analysis and Recommendations on Environmental Justice and Women's Rights in Georgia

must be taken into account in disaster preparedness policy, as well as during the implementation of disaster prevention, assessment, preparedness, and response measures[22].

Generally, disasters tend to hit the poorest and most marginalized demographics the hardest. Women and girls are particularly exposed to climate-related disaster risk—they are likely to suffer higher rates of mortality, morbidity, and economic damage to their livelihoods. Women bring unique experiences and skills to disaster risk reduction and management, although these skills are often not acknowledged or tapped into sufficiently. Increased awareness of the drivers, pressures, stressors, and opportunities associated with climate-related disasters is key to finding smart pathways to reduce and manage disasters. It is therefore imperative that disaster risk reduction and management strategies are gender-aware, taking into account both gender-based vulnerabilities as well as women's unique contributions[23]. The higher vulnerability to disasters among women, compared to men is determined by lower capacity of women for survival during hazards, more proneness to poverty, more hours occupied with household tasks and caring duties, less participation in governance, less involvement in designing early warning strategies, rehabilitation, and recovery plans. Low participation of women in public life prevents them to voice their concerns, ideas referring to appropriateness of existing or planned warning system and optimal possibilities for recovery. Not many women are found in decision-making bodies neither on national nor, and more importantly, on a local level in Georgia. In 2019, women comprised only 14.8% (22 women) in national parliament and even less, 13.5% (277 women) in local self-governing bodies[24]. So, their impact on the security policy and shaping of rebuilding strategy cannot be considerable.

Due to the above-mentioned factors, women disproportionally suffer from natural disasters compared to men. They are less engaged in the planning of warning and rehabilitation strategies, mostly due to their little representation in elected bodies. But their capacity for the whole cycle of hazard management should be fully utilized to reduce vulnerability, increase safety and effectiveness of rehabilitation efforts.

For formulating and implementing gender-sensitive disaster risk reduction policies, plans and programmes:

1. Gender Equality Law of Georgia adopted in 2010[25] should be revised and added specific article to strengthen legal framework for integration gender components in disaster risk management sphere.
2. The Gender Equality Plan of action developed by the Government of Georgia, is one of the main instruments for achieving Gender Equality. The plan contains different goals and activities for the implementation of gender mainstreaming policy including section about gender and environment, but it is important to strengthen this direction and focus more on increasing women's role in disaster risk management.

22 National Disaster Risk Reduction Strategy of Georgia 2017-2020 and its Action Plan approved by Resolution N4 of The Government of Georgia in January 2017

23 Röhr, U., (2006). 'Gender and Climate Change,' Tiempo, Issue 59. Available at: http://www.tiempocyberclimate.org/portal/archive/pdf/tiempo59high.pdf

24 UN Women (2020) Gender Equality in Georgia

25 Law of Georgia on Gender Equality 2010 available at: https://matsne.gov.ge/en/document/view/91624?publication=9

5. MULTI-HAZARD EARLY WARNING SYSTEM AND WMO CHECKLIST

Early Warning System, according to officially adopted UNDRR terminology, refers to *"An integrated system of hazard monitoring, forecasting and prediction, disaster risk assessment, communication and preparedness activities systems and processes that enables individuals, communities, governments, businesses and others to take timely action to reduce disaster risks in advance of hazardous events"*[26]. Annotations: Effective "end-to-end" and "people-centred" early warning systems may include four interrelated key elements: (1) disaster risk knowledge based on the systematic collection of data and disaster risk assessments; (2) detection, monitoring, analysis and forecasting of the hazards and possible consequences; (3) dissemination and communication, by an official source, of authoritative, timely, accurate and actionable warnings and associated information on likelihood and impact; and (4) preparedness at all levels to respond to the warnings received. These four interrelated components need to be coordinated within and across sectors and multiple levels for the system to work effectively and to include a feedback mechanism for continuous improvement. Failure in one component or a lack of coordination across them could lead to the failure of the whole system.

Multi-hazard early warning systems address several hazards and/or impacts of similar or different type in contexts where hazardous events may occur alone, simultaneously, in cascade or cumulatively over time, and taking into account the potential interrelated effects. A multi-hazard early warning system with the ability to warn of one or more hazards increases the efficiency and consistency of warnings through coordinated and compatible mechanisms and capacities, involving multiple disciplines for updated and accurate hazards identification and monitoring for multiple hazards.

A checklist of the Multi-hazard Early Warning System was developed as the key outcome document of the first Multi-hazard Early Warning Conference organized by WMO on 22 - 23 May 2017 in Cancun, Mexico. The checklist was prepared by the partners of the International Network for Multi-hazard Early Warning Systems[27]. The checklist, which is structured around the four key elements of early warning systems, aims to be a simple list of the main components and actions to which national governments, community organizations and partners within and across all sectors can refer when developing or evaluating early warning systems. It is not intended to be a comprehensive design manual, but instead a practical, non-technical reference tool to ensure that the major elements of an effective early warning system are in place.

The four major elements of the people-centred Multi-Hazard Early Warning System defined by the checklist are:

26 UNDRR, Early warning system, available at: https://www.undrr.org/terminology/early-warning-system

27 Multi-hazard Early Warning System: Checklist: https://library.wmo.int/doc_num.php?explnum_id=4463

Disaster risk knowledge ◆ Are key hazards and related threats identified? ◆ Are exposure, vulnerability, capacities and risks assessed? ◆ Are roles and responsibilities of stakeholders identified? ◆ Is risk information consolidated?	**Detection, monitoring, analysis and forecasting of the hazards and possible consequences** ◆ Are there monitoring systems in place? ◆ Are there forecasting and warning services in place? ◆ Are there institutional mechanisms in place?
Warning dissemination and communication ◆ Are organizational and decision-making processes in place and operational? ◆ Are communication systems and equipment in place and operational? ◆ Are impact-based early warning communicated effectively to prompt action by target groups?	**Preparedness and response capabilities** ◆ Are disaster preparedness measures, including response plans, developed and operational? ◆ Are public awareness and education campaigns conducted? ◆ Are public awareness and response tested and evaluated?

Source: Multi-hazard Early Warning System: Checklist, WMO, 2018

In addition to the four elements, several cross-cutting issues that are critical for the development and sustainability of an effective early warning system have been outlined. These include effective governance and institutional arrangements, a multi-hazard approach to early warning, involvement of local communities, consideration of gender, age and disability and cultural diversity, and other elements. Each checklist covers one of the four elements. Checklists provide for a series of major themes and include a simple list of questions and actions that, if followed, will provide a solid basis upon which an efficient early warning system can be built.

As already mentioned above, the focus of this analysis is the first part of the WMO MHEWS Checklist - Disaster Risk Knowledge. Disaster Risks arise from the combination of hazards, exposure of people and assets to the hazards and their vulnerabilities and coping capacities at a particular location. Assessments of these risks require systematic collection and analysis of data and should consider the dynamics and compounding impacts of hazards coupled with vulnerabilities resulting from unplanned urbanization, changes in rural land use, environmental degradation, and climate change. The level of risk can change depending on the actual impacts and consequences of hazards. Therefore, the risk assessment must include an assessment of the community's coping and adaptive capacities. It is also important to gauge the perception of the level of risk faced by those who are vulnerable. Studies of human interaction and reactions to warnings can also provide insights to improve the performance of early warning systems. Disaster risk assessments should be used to identify the location of vulnerable groups, critical infrastructure, and assets, to design evacuation strategies including evacuation routes and safe areas, and to expand warning messages to include possible impacts. For example, maps based on risk assessments help to motivate people, prioritize needs and interventions

and guide preparations for disaster risk management measures, including prevention, preparedness, and response.

Disaster risk assessments and risk management can become essential inputs for planning and policies in a number of areas of public and private activity. By improving the awareness and understanding of the risks, decision makers, stakeholders and interested parties are in a better position to agree on the preventative measures to take and to prepare in ways to avoid the most severe consequences of natural and man-made hazards and of other adverse events. Furthermore, the process of producing a risk assessment will enable both public authorities and businesses, NGOs, and the general public to reach a common understanding of the risks faced as a community and help fostering an inclusive debate about the relative priority of possible prevention and mitigation measures. Wide dissemination and awareness raising are important steps to further develop and fully integrate a risk prevention culture into sectoral policies, which are often complex and involve many stakeholders. Risk assessments and risk mapping contribute to ensuring that policy decisions are prioritized in ways to address the most severe risks with the most appropriate prevention and preparedness measures and can in the process also become an instrument of solidarity[28].

For the analysis, all criteria of the Disaster Risk Knowledge specific checklists were utilized in order to conduct compatibility review with the relevant parts of Georgian legal and institutional framework. The Review was conducted through assessment of existing laws and secondary legislation, technical regulations, procedures, and charters of institutions in order to assess the existing set up and to identify deficiencies and gaps.

Thus, the analysis has been structured according to the 5 criteria of the Disaster Risk Knowledge specific WMO checklist:

(1) Identification of key hazards and related threats
(2) Assessment of exposure, vulnerabilities, capacities, and risks
(3) Roles and responsibilities of stakeholders
(4) Consolidation of risk information
(5) Incorporation of risk information into the early warning system.

Each of the criteria is discussed separately, in the specific chapter of the analysis.

28 EC, Commission Staff Working Paper, Risk Assessment and Mapping Guidelines for Disaster Management, Brussels 21.12.2010, SEC (2010) 1626 final

6. LEGAL FRAMEWORK RELATED TO IDENTIFICATION OF KEY HAZARDS AND RELATED THREATS

When assessing the framework for identification of key hazards and related threats in a given country, the WMO Disaster Risk Knowledge Checklist recommends taking into account the following:

- Characteristics of key hazards (e.g., geographical extent, magnitude, intensity, disease transmissibility, frequency, probability), including possible cascading hazardous events, are analysed, historical data evaluated, and potential future risks assessed.
- Hazard maps (dynamic and multi-hazard, when possible) are developed that identify the geographical areas/people that could be affected by hazards.

6.1 Hazard Risk Profiling

The chapter 22 of the EU-Georgia Association Agreement is focused on Civil Protection[29]. According to the provisions of this chapter, *"the parties shall develop and strengthen their cooperation on natural and man-made disasters"* and the *"cooperation shall aim at improving the prevention of, preparation for and response to natural and man-made disasters"*. Article 379 of this chapter particularly defines that the cooperation covers mutual support *"on improving the knowledge base on disasters and on hazard and risk assessment for disaster management"*. The above-mentioned provisions are reflected in Georgia's National Disaster Risk Reduction Strategy 2017-2020,[30] which has been approved in compliance with article 15.4 of the Law of Georgia on the National Security Policy Planning and Coordination[31] and which also relies on Sendai Framework for Disaster Risk Reduction 2015 – 2030.[32]

National Disaster Risk Reduction Strategy in its Chapter 3 "Main Priorities of Disaster Risk Reduction Policy" mentions that the preliminary identification and assessment of different disaster risks and planning of corresponding mitigation measures is critical for minimization of their negative consequences. For Disaster

29 "Association Agreement between the European Union and the European Atomic Energy Community and their Member States, of the one part, and Georgia, of the other part", 27/06/2014, Available at: http://www.parliament.ge/ge/ajax/downloadFile/34754/AA_ENG

30 The Ordinance of the Government of Georgia №4 on the approval of the National Disaster Risk Reduction Strategy 2017-2020 and its Action Plan, 2017 available at: https://matsne.gov.ge/ka/document/view/3547798?publication=1

31 The Law of Georgia on National Security Policy Planning and Coordination, 2015 available at: https://matsne.gov.ge/ka/document/view/2764463?impose=translateEn&publication=2

32 The Sendai Framework for Disaster Risk Reduction 2015-2030 adopted at the Third UN World Conference on Disaster Risk Reduction in Sendai, Japan, on March 18, 2015, Priority 1. Understanding disaster risk: "Disaster risk management should be based on an understanding of disaster risk in all its dimensions of vulnerability, capability, exposure of persons and assets, hazard characteristics and the environment. Such knowledge can be leveraged for the purpose of preliminary assessment of disaster risk, for prevention and mitigation, preparedness, and response." available at: https://www.preventionweb.net/files/43291_sendaiframeworkfordrren.pdf

Risk Reduction at Local Level (art. 3.3.1), one of the priorities of the Georgian Government is to introduce at the local level the methodology for identification, analysis, and assessment of natural disaster risks and to increase local capacities for implementing DRR measures. It is important that risks on local level are assessed by the local authorities. This implies identification of type of risks, risk factors, probabilities, possible consequences, vulnerabilities, and priorities. The reference technical guiding documents are described in the next chapter, "Hazard Modelling, Assessment and Mapping".

The main natural and man-made disaster risks facing Georgia are identified in the "National Threat Assessment Document 2015-2018" and include: floods, flash floods, landslides, mudflows, biological hazards, earthquakes, hails, avalanches, strong winds, forest and valley fires, chemical threats, soil erosion by water, draught, hydrodynamic accidents etc. The Threat Assessment Document of Georgia is a national level fundamental conceptual document that identifies threats facing Georgia, analyses possible scenarios, probabilities, and consequences of their realization. The Document illustrates the threats and challenges caused by military, external policy, internal policy, hybrid, transnational, socio-economic, natural, and human factors posing a significant threat to national security. The Threat Assessment Document of Georgia is a classified document. However, the first two Threat Assessment Documents of Georgia (respectively, 2007-2009 and 2010-2013) contained open sections. As for the latest Document, its secret version (only) was updated in 2015 covering the period of 2015-2018. Currently, an updating process of the Threat Assessment Document is underway which is coordinated by the National Security Council.[33] The legislative bases for preparation of the Threat Assessment Document is the Law of Georgia on National Security Policy Planning and Coordination, which authorises the National Security Council to coordinate preparation of the document and to submit it to the Government of Georgia (GoG) for approval. The Law also foresees creation of permanent or temporary interagency commissions or working groups for development of national level conceptual documents (Threat Assessment Document among them) and to approve structure and rules of operation of such commissions/working groups by the resolution of GoG.[34] By the amendment to the Law[35], from January 1st, 2019, it was specified that the responsible institution for preparation of natural and man-made disaster-related parts in the Threat Assessment Document was the Ministry of Internal Affairs. The same Ministry should have been preparing the publishing the non-classified, adapted version of the natural disaster chapters of the document. The current version of the Law does not include such requirement anymore. However, the statute of the EMS includes the responsibility to "prepare the natural and man-made disasters-related chapter of the Threat Assessment Document and its non-classified, adapted version".[36]

33 National Security Council of Georgia the official website, 2021 https://www.nsc.gov.ge/en/CONCEPTUAL-DOCUMENTS/Threat-Assessment-Document

34 The Law of Georgia on National Security Policy Planning and Coordination, 2015 art. 19 available at: https://matsne.gov.ge/ka/document/view/2764463?impose=translateEn&publication=2

35 Amendment (Dec 2018) to the Law of Georgia on National Security Policy Planning and Coordination, 2015 available at: https://matsne.gov.ge/ka/document/view/4421015?publication=0

36 Statute of the Emergency Management Service, a sub-agency under the Ministry of Internal Affairs, approved by the Order of Minister of Internal Affairs of Georgia nr. 24 of 29 March 2019 available at: https://matsne.gov.ge/ka/document/view/4522158?publication=2

The general assessment of threats is included in Georgia's National Disaster Risk Reduction Strategy 2017-2020. The working process on preparation of the updated Strategy for the next period is currently ongoing.

6.2 Hazard Assessment, Mapping and Modelling

The UNFCCC/INDC, Sendai Framework and a number of national legal and policy documents together with the EUAA, oblige Georgia to set and operate a dynamic standardized user-friendly database on natural hazards. Moreover, the Aarhus Convention, which Georgia is a party Georgia to, obliges the country to ensure access to environmental information.

Specifically on floods, based on the EU-Georgia Association Agreement, Georgia has committed to gradually approximate its legislation with the EU legislation and instruments for improving the assessment and management of flood risks. The following provisions of the Directive No 2007/60/EC on the assessment and management of flood risks[37] need to be implemented (within a timespan of four to nine years, from the entry into force of the EU-Georgia Association Agreement): - the adoption of national legislation and the designation of competent authorities; - undertaking a preliminary flood assessment; - preparation of flood hazard maps and flood risks maps; - establishment of flood risk management plans.

National Environment Agency (NEA) is mandated to conduct hazard mapping and assessments for most hazards. The statutory goals and responsibilities of NEA, that are relevant to assessment, mapping and modelling of hazards include[38]:

- Establishment of systems for monitoring of ongoing meteorological, hydrological, and geological processes on the territory of Georgia and ensure their proper functioning.
- Collection and dissemination of environmental monitoring data at national and international levels, including the global information networks.
- Processing collected environmental observation data, assessment of the state of environment and dissemination of relevant information.
- Participating in hazard risk assessment of hydrometeorological, geological and ecological hazards on the territory of Georgia.
- Within its competence, updating information funds on quality status of hydrometeorology, geology and environment and development databases by using state-of-art technologies.
- Statistical processing of current and multi-year data on hydrometeorological, geological and environmental quality status and elaboration of relevant reports, bulletins, reviews, and other reference materials.
- Elaboration of state geological maps (geological survey).

37 Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks, available at: https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=celex%3A32007L0060

38 Statute of the National Environment Agency 2018 approved by the Order of Minister of Environmental protection and Agriculture of Georgia nr. 2-255 available at: https://matsne.gov.ge/ka/document/view/4148180?publication=5

Specifically, NEA's Department of Geology[39] is mandated to develop maps, describing geological processes and the risk zones on regional and municipal level in order to protect population and infrastructure.

In addition to NEA, hazard monitoring and mapping are undertaken by different technical institutions for various sectors, based on sector-specific methodologies (hydrometeorological hazards, geological hazards seismological hazards, epidemics).

The hazard-related information, including hydrometeorological, geological monitoring and hazard data, are stored at the NEA, mostly in paper formats, and are only available for free to government entities. For individual citizens (e.g., students, researchers, etc.), NGOs, development projects, educational and scientific/research and academic institutions, these data are not available for free.

The most widely available hazard maps are on floods and geological hazards (e.g., landslides, mudflows, and rock falls). For other hazards maps are lacking. Most existing hazard maps are small-scale (e.g., 1:100 000, 1:200 000, 1:500 000 and 1:2 000 000) maps. There is a significant shortage of larger-scale maps, and thus a need to develop these[40]. Existing hazard, climate and geological databases and GIS maps are not fully compatible with the requirements and standards of the INSPIRE directive, and are also not linked with the Geospatial Portal, created within the NAPR under the SIDA-supported project which aims at building a unified Geospatial information system in Georgia, with a single common Geoportal and relevant meta-databases in line with the INSPIRE directive[41].

Multi-hazard mapping is usually accomplished by combining various hazard maps in GIS systems. NEA does not have experience in multi-hazard mapping and does not practice it.

The modelling is a way of compensating for the limited available historical information, particularly in the case of extreme events related to intensive risk.[42] It is rare that any geographical region will have experienced a full range of hazard intensity events; so probabilistic modelling is an effective way of simulating any event irrespective of intensity. Hazard models estimate the probability of occurrence of a specific hazard, in a specific time period, as well as its intensity and area of impact. Globally, there are many models differing in

39 Statute of the National Environment Agency 2018 approved by the Order of Minister of Environmental protection and Agriculture of Georgia nr. 2-255 available at: https://matsne.gov.ge/ka/document/view/4148180?publication=5

40 Assessment of Hazard Mapping System in Georgia and recommended Actions Road Map, 2018 GEO available at: file:///Users/ekaterineotarashvili/Downloads/UNDP_GE_EE_Hazard%20Mapping%20System%20in%20Georgia_Recommedations_ENG.pdf)

41 European Directive 2007/2/EC establishing an Infrastructure for Spatial Information in the European Community (INSPIRE) aims to create an EU Spatial Data Infrastructure (SDI), enabling the better sharing of environmental spatial information and public access to spatial information across Europe. Geospatial information considered under the Directive is extensive and includes a great variety of themes. Available at: http://inspire.ec.europa.eu/data-specifications/2892. The INSPIRE geoportal prototype is available at http://inspire-geoportal.ec.europa. eu. Regardless of the fact that Georgia is not obliged to transpose INSPIRE into Georgia, the Government of Georgia (GoG) has already started this process.

42 Global assessment report on disaster risk reduction 2015

their resolution, computational power, and number of variables, which are highly technical but all of which are only as good as the data used. So, comparative data quality through Georgia is key to accurate decision-making. Lack of modelling tools, knowledge, and capacities in application of numerical models lead to the current situation, when the institutions, responsible for the assessment of hazard risks, are not regularly performing hazard modelling. In the framework of UNDP Programme on Reducing the Risk of Climate-driven Disasters, the following methodologies were prepared and accepted by NEA:

- Methodology for flood hydraulic and hydrological modelling.
- Methodology for drought modelling and mapping.
- Methodology for avalanche modelling and mapping.
- Methodology for landslide and mudflow modelling and mapping.
- Methodology for windstorm and hailstorm modelling and mapping:

In addition to those, the methodology for multi-hazard modelling is in the process of preparation.

6.3 Hazard and Risk Data Sharing

By its Resolution #262 (2013, amended in 2015) "on Setting up the Governmental Commission for the Establishment and Development of Spatial Data Infrastructure" GoG initiated the creation of the National Spatial Data Infrastructure in Georgia. The Resolution defined the aim, structure, authority, and activity of the Commission[43]. National Spatial Data Infrastructure (NSDI) is a system of *"technology, policies, standards, and human resources necessary to acquire, process, store, distribute, and improve utilization of geospatial data"*. The goals of the NSDI are to reduce redundancy and costs in geospatial data creation and maintenance, improve access to geospatial data, and improve the accuracy of geospatial data used by the broader community. To achieve compatibility within the system, production of geographic data, electronic services and metadata should be regulated by relevant legal acts, standards, regulations, and methodologies in accordance with the principles of harmonization and interoperability. Currently, developing NSDI is ongoing with coordination by National Agency of Public Registry under the Ministry of Justice (NAPR)[44].

The key element of NSDI is data sharing that provides reduction of costs of spatial data production due to ruling out of doubled work. Data quality increases, and efficient planning of various areas makes accurate and actual information available. Such areas as defence and security, economics, energy, health, real estate market, land management, transport, tourism, agriculture, education, culture etc. require availability of harmonized geographic data, e.g. existence of transport, addressing network spatial data is crucial for optimal managing of fire, road accidents, natural disasters, accidents, crisis situation, rescue operations, for valuation of environmental impact risks, for planning tourist routes, new medical, educational and other

43 Resolution of the Government of Georgia #262, (2013, amended 2015) on Setting up the Governmental Commission for the Creation and Development of Spatial Data Infrastructure available at: https://matsne.gov.ge/ka/document/view/2044006?publication=2

44 Georgian National Spatial Data Infrastructure, http://nsdi.gov.ge/en/about-nsdi

organizations. In the near future, NSDI intends to integrate hazard and risk maps into its online Geo portal in cooperation with the NEA and other stakeholders. As Georgian NSDI is to be built in compliance with INSPIRE, all spatial data infrastructure instruments, including hazard data creation and mapping and risk-related data, are contemplated as key components of the NSDI and every development in the field of hazard and risk mapping data collection & sharing, including metadata, should take into account NSDI development direction and processes. NEA is an important player in the process. As per the resolution of the Government of Georgia Nr.502 on establishing the types of services provided by NEA and their prices[45], the data of the following categories is available (relevant for natural hazard assessment): Geology, Hydrometeorology historic data, Climatology data) Climatology studies, Hydrometeorology calculations, Hydrometeorology prognosis, Hydrology data streams, Hydrology fieldwork, Hydromorphology studies/designs, Hydrometry gauge installation. As one could see, the most of NEA data is highly relevant for natural hazard assessment. At the same time, for the time being, there are no separate data standards for hazards. The same could be mentioned about the disaster risk data (EMS owned and operated), which also needs to be of certain standards to satisfy the requirements of harmonization and interoperability within NSDI. Therefore, it is important to ensure that the mentioned data is compatible with other data of the NSDI system, and that the data is being produced using the legally established harmonized standards and methodologies.

Also, it is planned to accelerate NSDI development in Georgia, using the jointly developed and newly approved United Nations and World Bank Integrated Geospatial Information Framework (IGIF).

6.4 Identified Gaps

The Law of Georgia on National Security Policy Planning and Coordination, which represents the legislative bases for preparation of the Threat Assessment Document, authorizes the Ministry of Internal Affairs to prepare natural and man-made disaster-related parts for this Document. The Ministry further delegates this responsibility to EMS. Accordingly, the statute of EMS includes the responsibility to prepare and publish the non-classified, adapted version of the natural disaster chapters of the document. However, the latest version of the Law on National Security Policy Planning and Coordination does not include the requirement for publishing of the non-classified, adapted version of the natural disaster chapters of the National Threat Assessment Document.

Georgia's current National Disaster Risk Reduction Strategy's Action Plan includes activities, which had to be implemented during the period of 2017-2020.The working process on preparation of the updated Strategy and the Action Plan for the next period is currently ongoing. It is recommended to elaborate the guiding document on evaluation of the implementation of the activities included in the action plan and to perform actual evaluation based on Manual for the Strategic Planning, Monitoring and Evaluation approved by the Ordinance of the Government of Georgia No. 629 on Policy Planning Manual of 20 December 2019.

45 Resolution of the Government of Georgia Nr.502 dated 18.09.2014 on establishing the types of services provided by NEA and their prices. Available at: https://matsne.gov.ge/ka/document/view/2465275?publication=8

For the purpose of development of NSDI system based on principles of harmonization and interoperability, it is important to ensure that the hazard and risk data is compatible with other data within the system. Currently, Georgia lacks separate technical regulations for hazard and risk data preparation and sharing, so the data is being produced using the legally established harmonized standards and methodologies. The elaborated technical regulations should make use of the respective methodological documents, prepared by the UNDP Programme on Reducing the Risk of Climate-driven Disasters. Also, there is no enabling institutional environment for implementation of such regulations, relevant changes should be made to the statutes of responsible entities (NEA, EMS, other entities who are obliged to collect data).

There is very limited experience in Georgia in multi-hazard mapping. A unified hazard mapping and assessment methodology regulated through a dedicated legal framework is lacking. Non-existence of national standards for geospatial data and maps, including hazard data and maps makes it impossible to align hazard data and maps with those standards and linking climate-induced hazard data and maps with a common, unique Geospatial Portal.

Currently in Georgia there is no EU-compliant flood assessment and mapping methodology as mandated by the EUAA, where Georgia has committed to gradually approximate its legislation with the EU legislation and instruments for improving the assessment and management of flood risks. More specifically, to undertake a preliminary flood assessment and to prepare the flood hazard maps and flood risks maps. However, Georgia has not approved yet the EU-compliant flood assessment and mapping methodology that will be linked to the multi-hazard assessment and mapping methodological regulations.

There is lack of modelling tools, knowledge, and capacities in application of numerical models. Hence, the institutions, responsible for the assessment of hazard risks, are not regularly performing hazard modelling. The methodologies for modelling and mapping of specific hazards, such as floods, avalanches, landslides and mudflows, windstorms and hailstorms have been prepared and submitted to NEA, but not yet officially approved. The requirement of preparation of the respective maps and models that will be based on the approved methodologies is not reflected in the Charter of NEA and its specific departments. Also, the regulation on an international standards-based multi-hazard assessment and mapping methodology (including requirements to perform modelling) with delegation of authority among national and local level institutions has not been developed yet.

The poor comparative data quality through Georgia is also an important obstacle to implement modelling and for using it for the accurate decision-making. So, the specific standards and methodologies should be approved and made obligatory to follow by all entities that create data related to hazard and risk assessment. The inter-agency coordination should be established for provision of information from different levels and carefully coordinated institutional set-up created for hazard assessment, including information management and modelling.

7. LEGAL FRAMEWORK RELATED TO ASSESSMENT OF EXPOSURE, VULNERABILITIES, CAPACITIES AND RISKS

When examining the framework for assessment of exposure, vulnerabilities, capacities, and risks, the WMO Disaster Risk Knowledge Checklist recommends taking into accounts the following:

- Assessment and quantification of exposed people, services (e.g., hospitals) and critical infrastructure (e.g., electricity and water work, quality of building stock) conducted and mapped for all relevant hazards, as well as of any compounding risks, at local level in both rural and urban areas and coastlines.
- Impacts to critical infrastructure and secondary risks associated with these impacts are evaluated and risk management solutions considered to increase resilience.
- Vulnerability factors such as gender, disability, access to infrastructure, economic diversity, societal inequalities, and environmental sensitivities considered.
- Vulnerabilities of key economic sectors at national to local levels assessed; Historical and indigenous knowledge integrated into risk assessments.
- Activities that increase or compound risks (e.g., urbanization and land use) identified and evaluated.
- Risk assessment results integrated into local risk management plans and warning messages in a clear and easy-to-understand language with attention to how different people assess information.
- Legislation and cultural norms assessed to identify gaps that may increase vulnerability.

7.1 Vulnerability Assessment

There are various vulnerability assessment methodologies used to prepare and implement specific projects and programmes, mostly at the local level. Also in Georgia, different methodologies were/are used. The examples include climate change vulnerability assessment being implemented in the framework of National Communication Reports to the UNFCCC, or the flood vulnerability assessment conducted for Rioni River. However, the only legislation that includes guidance related to performing disaster vulnerability assessment is the Governmental Ordinances on emergency risk management plans[46] and emergency management plans[47]. Article 10 of the Ordinance of the GoG on preparing procedures for developing the emergency risk management plan is devoted to vulnerability assessment. The article defines vulnerability as: "vulnerability is a condition in which population and properties of population and relevant bodies of Unified System of Emergency Management become unprotected". The ordinance does not identify the body responsible for conducting vulnerability assessment specifically, but generally, the requirement to develop and approve the Risk Management Plans applies to *"bodies of Unified System of Emergency Situation Management"*. It

46 The Ordinance of the Government of Georgia on preparing procedures for developing the emergency risk management plan, №453, 2017 available at: https://matsne.gov.ge/ka/document/view/3824640?publication=0

47 The Ordinance of the Government of Georgia on preparing procedures for developing the emergency management plan, №452, 2017 available at: https://matsne.gov.ge/ka/document/view/3824640?publication=0

also states that: *"In addition to the relevant bodies of the Unified System the scientific-research institutions and field experts are also involved in the process of determination of emergency risk".* The vulnerability assessment is done at the risk analysis stage. There are two types of vulnerability – physical and social. Physical vulnerability is determined by the fatigue of infrastructure, characters of structures facing the hazard and force of damaging factors caused by emergency; At first the analysis of physical vulnerability is developed for the facilities falling within the category of public safety based on the following criteria: functional purpose of the facility, density of infrastructure positioning, number of floors, design solution, used construction materials and its type, necessity to use buildings during the emergency situation and etc. Assessment of physical vulnerability is done based on complex criteria, the meaning of which is determined by the sum of following separate categories:

- Durability criteria of building, which is determined by the analysis of consequences of expected emergency, experimental studies, and assignment of vulnerability class. The share of durability criteria in the sum of complex criteria is 0.25. The buildings are classified in 6 categories according to the establishment of durability criteria (Annex #5).
- Conformity criteria of buildings with the requirements of technical regulation. The share of conformity criteria of buildings with the requirements of technical regulation in the sum of complex criteria is 0.15. Numerical digit of these criteria is determined according to the passport of the building and parameters given in initial project assignment. In case of full conformity with the requirements of technical regulation, the criteria will be assigned numerical digit - 1; when the size of normative load is not in conformity with established norm taking into account the limit of the change in direction of deteriorating building exploitation conditions – 0.5; when structural frame is not made from non-combustible, rot resistant material – 0.75; when enclosed construction is made of non-combustible, rot resistant material – 0.85; other cases of non-conformity with the requirements of technical regulation – 0.9. In case of several occasions of non-conformity the minimum will be assigned.
- Criteria of building technical condition that is determined based on the external study of structural frame (Annex #6). The share of technical status category in the sum of complex criteria is 0.15.
- Criteria determined by size of factual characteristics of building construction frame in correlation with the data established for the sufficient endurance and normal exploitation conditions of these types of buildings. The share of the criteria in the sum of physical vulnerability is 0.45. The numerical digit of criteria shall not exceed 1.2. The following shall be conducted in order to determine the criteria: (1) geological, seismic, meteorological, climate, ecological and other studies of construction site; (2) determination of load caused by the damaging factors of potential emergency situation and selection of relevant calculation scheme; (3) numerical simulation of construction arrangement of buildings; (4) Building calculation and result analysis.

Social vulnerability is determined by the quality of protection, preparation and awareness of population facing the hazard. The assessment of social vulnerability is done by establishment of arithmetic mean of public safety parameters in correlation with the damaging factors caused by hazard. The parameter of public

protection from damaging factors caused by hazard is determined in Annex #7 of the ordinance. As a result of performed assessments, the map on vulnerability elements should be created.

The review of local (municipal) level emergency management plans provides the following observations related to the vulnerability assessment, to be performed at the stage of emergency planning on municipal level and suggests the following improvements to the existing methodology:

- Disaggregation of the information on population: When researching and developing the municipal profile, planners should seek to characterize or, when possible, quantify population groups that are often most vulnerable or unprotected during a disaster. Currently the information in the collection tool is not disaggregated by gender. The tool should be updated to include this specificity. Additionally, some municipalities may have higher concentrations of particular groups of other vulnerable populations for a variety of reasons, thereby increasing risk for members of this group during disasters. Such groups include children, the elderly, those with disabilities, homeless, migratory workers, LBGTQ+, and tourists.
- Disaggregation by gender: It would be helpful for emergency responders and planners of disaggregate the population data by gender. This will help to better determine in advance potential needs, considerations, and challenges associated with ensuring these groups are protected during a crisis. It will also be beneficial to emergency planners to include the numbers of persons with disabilities derived from the census taken by the Ministry of Internally Displaced Persons from the Occupied Territories, Labour, Health, and Social Affairs of Georgia. Such statistics should be added to the data collection tool.
- Description of common aspects or trends of residential or commercial constructions: when describing the municipality, it could be useful to planners to describe common aspects or trends of residential or commercial construction within the municipality. These helps to further categorize the risk for the municipality, as certain construction types can be more vulnerable to specific hazards. This could include:
    - Land-use planning and zoning restrictions in the municipality, including how areas of the municipality are zoned (residential, commercial, industrial, national park, etc.) or other construction guidelines aimed at reducing risk and improving environmental conditions.
    - Common construction techniques, such as: wood frames, concrete construction that is reinforced with steel, steel framed commercial buildings, etc. Common trends in construction materials and techniques will influence the resilience of municipal homes, businesses, and structures to climate-related influences (such as rains, flooding, and high winds), wildfire vulnerability, or seismic activity
    - Most common methods for heating homes, such as: natural gas supplied directly to homes, natural steam, wood burning fireplaces, residential oil, etc. Understanding how homes are heating will help anticipate vulnerabilities (i.e., deliver pipelines, storage tanks, etc.) in supply lines, particularly during cold-weather months.
    - Most common methods for receiving drinking water, such as: municipal water systems, wells, rainwater collection cisterns, etc. Potable water sources, storage, and delivery systems can be vulnerable during climate-influenced emergencies such as droughts, heavy rain, or freezing temperatures.

- Most common methods for power generation, such as: coal burning generation station, nuclear generation, hydroelectric generation, solar, etc.; and power distribution, such as above ground transmission lines, underground transmission lines, etc. Power generation stations can have an influence on the environment, but also be vulnerable to climate-related emergencies, such as flooding and droughts. Transmission systems, such as above ground transmission lines and solar panels can be vulnerable to climate-related emergencies such as high winds, flooding, and hailstorms.
- Brief description of any recent disaster reduction or hazard mitigation projects undertaken within the municipality, such as creation of drainage systems, designation of municipal flood zones, elevation of structures in known flood zones, etc.

Modelling of the exposure and the vulnerability is not legally required and is generally not being practiced in Georgia. Socio-economic impacts take many forms, and a decision has to be taken when vulnerability modelling to set out the impacts to be considered and measured or quantified. A decision must also be made as to the type of damages and losses vulnerability assessments should concentrate on. It is important to distinguish the objectives of a model:

- *Exposure models* account for the people and properties and land identified, along with numerous specific characteristics such as the occupancy, construction type and age of buildings, as well as their replacement value.
- *Vulnerability models* typically analyse receptor (buildings, agricultural land, infrastructure etc.) vulnerability through the use of vulnerability functions (or 'curves') that describe a probable damage severity or economic loss for a particular receptor when it is subjected to hazard intensity.

The list of the appropriate socio-demographic indicators that are most relevant to affecting the populations' coping strategies both during and in the aftermath of a hydrometeorological hazard incident and defines the extent of social vulnerability has been prepared by the UNDP. These indicators compatible with the 2017 UNDP Report: "Social Vulnerability Assessment Tools for Climate Change and DRR programming: A guide to Practitioners" and are mostly available from either Geostat data[48] (Household survey) or the 2014 Census, though statistics from the latter are not updated to current values. The criteria most closely aligned to community social vulnerability relate largely to a potential lack of coping capacity of households or individuals.

48 National Statistics Office of Georgia, official website: https://www.geostat.ge/en/modules/categories/41/population

7.2 Utilization of Risk Knowledge - Spatial and Urban Development Planning

The existing system of spatial planning in Georgia is based on the "Spatial Planning, Architectural and Construction Code of Georgia" (2019)[49]. The Code defines the general system of spatial and urban planning, its principles, goals, and objectives. It also gives the definition of planning types, their hierarchy and sets rules and procedures for development and approval of the plans. The goals and objectives of spatial and urban planning are to regulate development of settlements at the whole territory of Georgia and its parts, reconciling different sectoral interests and overcoming possible contradictions between different levels of planning, creating conditions for harmonious development of human environment. The development of separate parts of the territory of Georgia shall be in accordance with the basic principles of spatial planning, and the spatial planning of the entire territory of Georgia shall take into account the basic requirements for the development of its separate parts. The spatial planning in Georgia should promote its full integration with the basic requirements of European and international development. According to the Code, one of the guiding principles of the spatial and urban development planning should be protection of the settlements from natural, man-made and social dangers and emergencies (including fires) through appropriate planning solutions and engineering and economic-organizational measures.

The Code establishes the following hierarchy of the spatial and urban development plans and requires their compatibility to be ensured:

- **Spatial plans:**
  Spatial Plan of Georgia; (to ensure regulation of spatial arrangements, development, and proper provision of the entire territory of the country, as well as the creation of precondition for coordinated spatial planning at the lower level)

- Spatial Plan the Autonomous Republics; (specifies the spatial plan of Georgia within the administrative boundaries of the respective Autonomous Republic, with the purpose to regulate development of the physical environment and infrastructure, as well as to create the necessary preconditions for the coordinated spatial planning at the lower level).

- Multi-Municipal/Municipal Spatial Plans; (the development of a spatial plan within the administrative boundaries of the municipality is the responsibility of the respective municipality and the aim is to regulate development of the physical environment and infrastructure within its boundaries. Based on the agreement of the municipalities, it is possible to develop a multi-municipal spatial plan for several/ more than one municipality. The law does not specify the conditions when the multi-municipal plan should be developed. In order to ensure harmonized development, the multi-municipal / municipality spatial plans should take into account the interests of other, neighbouring municipalities or the requirements of already existing plans.)

49 Law of Georgia - Spatial Planning, Architectural and Construction Code of Georgia 2018 available at: https://matsne.gov.ge/ka/document/view/4276845?publication=8

- **Urban development plans:**
  General plan.
  Development regulation plan.
  Detailed development regulation plan.

At the central government level, currently, the Spatial Planning Department of the Ministry of Regional Development and Infrastructure is the principal responsible entity for the urban development issues. The Department is responsible for organizing spatial planning of the country and for promoting sustainable and safe development of settlements (cities, towns, villages, resorts, and other urban areas) at all levels - ensuring the development of spatial plans for the country, autonomous republics, municipalities, and urban development plans for settlements in cooperation with the respective municipalities, methodological support for their development and coordination of implementation. The department also participates in the analysis of legislation regulating the field of spatial planning and urban planning, preparation of proposals and projects, methodology and instructions.

Another key institution in the field is the Spatial Planning and Construction Policy Department of the Ministry of Economic and Sustainable Development of Georgia. The department reviews the spatial-territorial planning documentation of all hierarchies. After studying the documents, the department prepares the project documentation for the further discussions at the Committee of Regulation of the Use and Development of Settlement Territories approved by the Order N1-1 / 196 of the Minister of Economy and Sustainable Development of Georgia, April 8, 201650.

At the level of Autonomous Republics, the Government of ARs are responsible for development of Spatial Plans, which should specify the Spatial Plan of Georgia for the territory of respective Autonomous Republic. As for the Multi-municipal/Municipal Spatial Plans, the Local Self-Government Code,[51] as well as Spatial Planning, Architectural and Construction Code of Georgia, grant the responsibility to prepare plans to the local self-governments for the territories under their jurisdiction. The Municipalities are responsible for land use/master planning, zoning, construction permits and supervision, social housing, communal infrastructure development, building management, and maintenance and new construction.

According to the Land Use Master Plan of Tbilisi adopted in 2019[52], the city of Tbilisi is divided into functional and territorial-structural zones. Functional zoning is part of land use zoning that identifies urban areas according to the dominant type of their use. According to the Land Use Master Plan and the Resolution of

50 Ministry of Economy and Sustainable Development of Georgia, Spatial Development, City-building and Construction: http://www.economy.ge/?page=services&s=50&lang=en

51 The Organic Law of Georgia the Local Self-Government Code 2014 available at: https://matsne.gov.ge/en/document/view/2244429?publication=44

52 Resolution of Tbilisi Council №39-18 of 15 March 2019 on the approval of the Tbilisi Land use Master Plan available at: https://matsne.gov.ge/en/document/view/4508064?publication=0

Tbilisi city territories use and development regulation rules[53], the city of Tbilisi is divided into general and specific functional zones (sub-zones). Specific standard and city development parameters are set out for each zone, which are as follows:

- Land development coefficient (Coefficient-1)
- Land development intensity coefficient (Coefficient -2)
- Land greening coefficient (Coefficient -3)

Territorial-structural zoning is also part of the land use zoning that divides territories of Tbilisi city on a territorial-structural basis (Central zone of the city, middle zone, peripheral zone, city planning frame). The general functional zones of Tbilisi include landscape-recreation zone, agricultural zone, recreation zone, special zone, residential zone, transport zone, public-business zone, industrial zone, sanitary zone, and forest zone. In addition to functional and territorial-structural zoning, there are restrictive lines/zones, layers, and contours, which are depicted in the Land use Master Plan, where urban planning and development either is restricted or banned. These are as follows:

A. Urban development restrictive contours:
   - Urban development contour
   - Rural development contour
B. General cultural heritage protective zones:
   - Historical districts protection zones
   - Historical districts regulation zones
   - Historical landscapes protection zones
C. Sanitary protection zones:
   - Water sanitary protection zones
   - Cemeteries' sanitary protection zones
   - Landfills' sanitary protection zones
D. Engineering-technical restrictions:
   - Engineering design restrictions
   - High voltage power transmission lines right of ways
   - High pressure pipeline right of ways
E. Environmental protection zone 3 – green areas of state forests
F. Floodplain areas
G. Geodynamic hazard and risk areas
H. Aerodrome's territory of Tbilisi International Airport surrounded by the barriers
I. Recreation zone of special regulation

53 Resolution of Tbilisi Municipal Council №14-39 of 24 May 2016 on the approval of the Tbilisi city territories use and development regulation rules, available at: https://matsne.gov.ge/en/document/view/3292207?publication=0

Along with the Spatial Planning, Architectural and Construction Code,[54] Governmental Resolution Nr. 260 (2019) on approval rules of preparation of spatial and urban development plans includes guiding information and the basis for development and approval of such plans and provides compulsory framework.[55] The Resolution requests the preliminary research to be conducted and specifies its content and structure. The indicative list of baseline information is provided in the Annex VI of the Resolution and includes among others, the geomorphological data: (1) Engineering-geological data of appropriate scale for a specific taxonomic level; (2) Natural and/or man-made hazards assessment map; (3) Natural or technogenic risk assessment prepared based on the hazard assessment map. As stated, the above-mentioned list is not obligatory and is to be used as "recommended". Neither the Code, nor the Resolution specifies which hazards should be taken into consideration. It gives only general instruction: to include "territories under risk from floods, mudflows and other natural phenomena", however, Annex I of the Resolution Nr.260 mentions "the recommended" content of the plan to include zones and areas for the risks of emergencies. Among them: floods, flash floods, mudflows, landslides, avalanches, desertification, strong winds, and storms. The Annex VI of the same Resolution includes matrix for data/indicators. Under "geomorphology" the annex "recommends" preparing maps for natural or technogenic hazards and to assess risks based on "field observations, relevant scientific atlases / studies".

There is no detailed information on the specifics of hazard maps and risk assessment plans, neither on the baseline data the maps and plans could be founded on. As per Resolution, it is recommended to update hazard maps and risk assessment plans every 10 years for high level plans and every 2 years for low level plans.

According to Tbilisi Master Plan (Article 29), the areas of geodynamic hazards have been determined based on existing general data and do not include accurate information for each separate plot, thus, it cannot be understood as a substitute for relevant geological study and research material. The map of geodynamic hazards is included as Annex to the Tbilisi Master Plan[56] and shows landslides and flash floods prone areas. No risk assessment plans are attached to the current Tbilisi Master Plan.

The review and approval of the spatial/urban development plans is performed according to the "administrative procedure". During the review, decision is made if the draft plan needs to undergo the Strategic Environmental Assessment (SEA). The Environmental Assessment Code of Georgia[57] requests implementation of strategic environmental assessment (SEA) - a procedure to examine and generally forecast potential impacts on the

54 Law of Georgia - Spatial Planning, Architectural and Construction Code of Georgia 2018 available at: https://matsne.gov.ge/ka/document/view/4276845?publication=8

55 The rules of preparation of spatial and urban development plans are established by Governmental Resolution Nr. 260 dated 3.06.2019 available at: https://matsne.gov.ge/ka/document/download/4579368/1/ge/pdf

56 Resolution of Tbilisi Council №39-18 on the approval of the Tbilisi Land use Master Plan 15 March 2019, available at: https://matsne.gov.ge/en/document/view/4508064?publication=0

57 Law of Georgia - Environmental Assessment Code 2017 available at: https://matsne.gov.ge/en/document/view/3691981?publication=2

environment and human health arising from the implementation of a strategic document, including strategic planning and spatial planning. As per the Code, the recommendations of the Ministry of Environmental Protection and Agriculture and the Ministry of Internally Displaced Persons from the Occupied Territories, Labour, Health, and Social Affairs are required in order for a strategic document, which is subject to an SEA, to be approved. When conducting environmental assessment direct and indirect impacts on human health and safety, biodiversity, water, air, soil, land, climate and landscape, cultural heritage and material assets should be identified, studied, and described. The study shall also include threats, against the risks of major accidents and/or natural disasters. Despite the existence of mentioned provisions, the DRR considerations are not fully integrated in land use zoning and spatial planning or in building codes, and thus there is a need for such actions. The procedure of reviewing draft plans from the point of identification of natural hazards and assessment of risks is not defined and the responsibilities of relevant institutions are not specified accordingly. E.g., there is general provision in NEA's charter[58] that authorizes its participation in assessment of risks posed by the hydrometeorological, geological, and ecological hazards on the territory of Georgia, but no specific mention of its participation in spatial/land use planning (at both levels, while preparation and while review) is in place. The review should be also connected to the SEA procedure. As per Environmental Assessment Code, MEPA is mandated to establish an Expert Commission to review SEA reports and draft strategic documents. An expert commission is composed of representatives of an institution within MEPA and of public experts. The commission could be used as a tool to ensure that hazard and disaster risk assessment considerations are well represented within the land use/urban development plans.

As per the statute, one of the functions of EMS is to permanently participate in risk identification, analysis, and assessment and to plan preventive measures and projects in cooperation with state authorities, autonomous republics, municipalities, and other entities[59]. The participation of EMS in the review of draft land use/urban development plans is not specifically requested.

7.3 Emergency Risk Management Plans

According to the Law on Public Safety (Article 5) the bodies of the National Public Safety System shall (among others): "ensure the emergency risk management - the identification of hazards, analysis of emergency situation risks and their impact, and the development of emergency risk management plans based on the analysis". The detailed guiding rules to follow when developing the Emergency Risk Management Plans is set in the Governmental Ordinance #453 "On Preparation Rules for Emergency Risk Management Plan", which implements the Law on Public Safety. The risk assessment of the key hazards, including mapping, is governed by this Ordinance. The Ordinance also assumes possible secondary damaging factors developed as a result of emergency situations and/or multiple risk (emergency situations expected to occur simultaneously or in

58 Statute of the National Environment Agency 2018 approved by the Order of Minister of Environmental Protection and Agriculture of Georgia nr. 2-255 available at: https://matsne.gov.ge/ka/document/view/4148180?publication=5

59 Statute of the Emergency Management Service, a sub-agency under the Ministry of Internal Affairs, approved by the Order of Minister of Internal Affairs of Georgia nr. 24 of 29 March 2019 available at: https://matsne.gov.ge/ka/document/view/4522158?publication=2

a short period of time, that depend on each other, caused by same reason or by several threats). However, this methodology is not applied in practice because of its complexity, lack of experienced assessors and especially because of a lack of respective input data for the risk analyses. A risk management plan is a precondition for elaboration of an emergency plan, which is governed by the Ordinance #452 On Preparation Rules for Emergency Management Plan.

The overall supervision functions related to the preparation of the Emergency Risk Management Plans is to be assumed by EMS. Under the Article 39 of the Law of Georgia on Public Safety[60], one of the main functions of EMS is to "identify, analyse and assess risks on the permanent basis, plan and implement preventive measures and projects in cooperation with bodies of the public authorities, Autonomous Republics, municipalities and legal entities under public and private law, in order to minimize the emergency risks"[61]. Also, according to the statute of the EMS[62], the public safety division of the EMS is responsible for organizing and supervision of the preparation of the Emergency Management and Emergency Risk Management plans throughout Georgia.

Under Article 5 of the Law of Georgia on Public Safety, the obligation to draft the emergency risk management plan applies to the subjects of the National System, except for the organizations and bodies of municipalities. For the purposes of the Law of Georgia on Public Safety, organizations are defined as educational, fostering, or medical institutions, industrial plants, or legal entities under private law, from the activities of which a threat of emergency situation may arise. Subsequently, all the above-mentioned organizations are exempt from the duty to prepare an emergency risk management plan. On the other hand, according to Article 3 of the Ordinance of the Government of Georgia on preparing procedures for developing the Emergency Risk Management Plan, only organizations are out of this obligation and municipalities still have to prepare the emergency risk management plan based on the inherent risk within the administrative boundaries of the municipality. To eliminate this legislative gap, there is a need to amend legislation and assign the responsibility of developing the emergency risk management plans to the municipality. According to the Article 5.2 of the Law of Georgia on Public Safety, Municipalities are managing emergency situations on the basis of delegation. The Government of Georgia makes the decision on the delegation, and the Ministry concludes an agreement on the delegation of the said powers.

The emergency risk management plans can be highly important for the MHDRIS due to the fact that it contains information such as, vector and scalar data, spatial expansion, and data on the whole geoinformation system, assessment of the impact of an emergency and vulnerability and hazard maps. Hence, for the fullness and completeness of the data stored in MHDRIS, emergency risk management plans created by municipalities will be vital. Similar discussion applies to the emergency management plan, due to the content (forecast

60 Law of Georgia on Public Safety 2018, available at: https://matsne.gov.ge/en/document/view/4243170?publication=2

61 Ibid, Article 39

62 The order of the Head of the Emergency Management Service Nr. 4, 2018 on the approval of the Statute of the Emergency Management Service. Available at: https://www.matsne.gov.ge/ka/document/download/4000154/0/ge/pdf

of emergency situations created as a result of accidents, catastrophes and natural disasters, adverse consequences of the expected emergency situation, analysis and evaluation of existing material and human resources, forecast map of the expected consequences of emergency situations, etc.)

7.4 Critical infrastructure

Georgia has no separate law on critical infrastructure (transposition of the EU Directive 2008/114/EC on critical infrastructure is not obligatory under the EU-Georgia Association Agreement). To shed further light on the topic of critical infrastructure and the related ongoing developments, the terminology has to be discussed first. The term "critical infrastructure" is not considered and defined by the Georgian legislation. The first attempt for unification of the respective legislation was undertaken within the draft ordinance of the Government of Georgia determining "the list of facilities of vital importance and the emergency prevention and response requirements on the facilities", however, this document does not reflect common understanding of the concept of critical infrastructure. For example, the annex to the draft ordinance contains the list of facilities, which are not essential assets for functioning of society and economy but important to be considered for immediate lifesaving actions (e.g., sport facilities accommodating more than 400 people and museums and galleries with total space with more than 1000 sq. m.). Due to the absence of the formal definition of the critical infrastructure, the governmental entities contributing to drafting of the ordinance were guided by their own sectoral competences and responsibilities in formulation and identification of facilities of vital importance. Moreover, the terms similar to critical infrastructure are currently presented in different normative acts as follows: "facilities of vital importance" (Law on Public Safety), "facilities with increased technical risks" (Product Safety and Product Movement Code), etc. The drafting process of the above-mentioned ordinance ("the list of facilities of vital importance...) was led by the Emergency Management Service, based on Article 72 of Law on Public Safety, and should be adopted till 1 January 2022.

According to the Law on Public Safety, the above-mentioned ordinance should divide the facilities of vital importance into categories depending on their defensive, economic, potential hazards and/or vital importance for the purposes of the assessment of damaging factors of the expected emergency situation and for responding to the emergency situation.

Based on the Law on Public Safety (Article 34), the facilities of vital importance are obliged to fulfil the fire safety requirements, and the emergency prevention and response requirements, as well as to fulfil the recommendation of an authorized official of the supervisory body and other legal requests. In February 2021, GoG issued an implementing regulation under the same law (on Public Safety) - Ordinance on Approval of the Procedure for Preparing a Municipality Safety Passport[63]. The municipality safety passport is a document for assessing the risk levels or possible effects of emergency situations in a municipality and for planning the development and implementation of measures intended for the reduction of emergency risk. The municipality

63 Ordinance of Government of Georgia Nr. 48 on Approval of the Procedure for Preparing a Municipality Safety Passport, 2021 https://matsne.gov.ge/ka/document/view/5095237

safety passport should include a list of potentially dangerous facilities existing within the territory of the municipality. The general types and criteria are provided by the table, annexed to the Ordinance. Based on the analyses of this table, the required list seems to be closer to the "facilities with increased technical risks" (Product Safety and Product Movement Code), then to "facilities of vital importance" (Law on Public Safety).

The other related legislation is the Ordinance No. 154 "On Safety Declaration Design Instruction for restricted type of enterprises"[64] defines obligation of recording risk analysis information for facilities with increased technical risk such as mines, power stations, main oil and gas pipelines, main oil, and gas reservoirs, i.e., elaboration of Safety Passports and Safety Declarations of such facilities. The Ordinance was approved as implementing sub-legislation to the Law on Safety of Facilities with Increased Risk, which has been repealed in 2010, however, the ordinance is still officially in force.

The list of facilities with increased technical risks is based on local practices and knowledge, and the only international experience, which is taken into consideration, is the EU SEVESO. Directive EU SEVESO on man-made (industrial) major accidents prevention (i.e., evaluation and prevention of the secondary risks from critical infrastructure or potentially hazardous industrial facilities), as well as the related EU Regulation on Classification, labelling and packing of chemical substances (CLP) have not yet been transposed into the Georgian legal framework, despite the obligations from the EU Association Agreement (EUAA).

Generally, in the context of critical infrastructure, the National Security Council and its predecessor institution analysed current legislation by comparing the best practices of the EU and North America and identified gaps. The process was also supported by NATO and UN expertise. In general, the National Security Council is following NATO, OECD, and UN guidelines. Due to the classified status of the process, the achieved results are not accessible for the public, however, the establishment of legal bases for critical infrastructure is an ongoing process and not foreseen to be finalized in the nearest future.

7.5 Identified Gaps

Existing Georgian legislation does not clearly establish rules, methodologies, and institutional arrangements for the vulnerability assessment toward natural hazards. Currently the vulnerability assessment is to be done at the risk analysis stage, as part of the preparation of the Risk Management Plans. The legislation does not identify a specific body responsible for conducting vulnerability assessment. Rather it includes general requirement to develop and approve the Risk Management Plans (including vulnerability assessment) that applies to *"bodies of Unified System of Public Safety"*.

Analogically, the legislative framework for the multi-hazard vulnerability assessment is also underdeveloped in Georgia. There are various vulnerability assessment methodologies used to prepare and implement specific projects and programmes, mostly at the local level. Currently, the guidance on performing disaster

64 Ordinance of Government of Georgia Nr.154 "On Safety Declaration Design Instruction for restricted type of enterprises", 2010 available at: https://matsne.gov.ge/ka/document/view/1020761?publication=0

vulnerability assessment is included in the Governmental Ordinances on emergency risk management pans[65] and emergency management plans[66]. However, the detailed methodology on the assessment of the vulnerability of exposed people, services and critical infrastructure to different hazards is not provided. The vulnerability assessment should be required on different levels and for different hazards. The principal legislation and the implementing technical and methodological secondary regulations might include among others the vulnerability mapping for all relevant hazards, as well as of any compounding risks, at local level in both rural and urban areas and coastlines; The evaluation of possible impacts to critical infrastructure and secondary risks associated with these impacts; Survey of the vulnerability factors such as gender, disability, access to infrastructure, economic diversity, societal inequalities and environmental sensitivities; Assessment of vulnerabilities of key economic sectors at different levels (national to local); Integration of historical and indigenous knowledge into risk assessment; Identification and evaluation of the activities that increase or compound risks (e.g. urbanization and land use). The current legislation does not ensure that risk assessment results are integrated into local risk management plans and warning messages in a clear and easy-to-understand language with attention to how different people assess information.

Modelling of the exposure and the vulnerability is not legally required to be part of the vulnerability assessment. No standards and indicators are established for the modelling to be based on. The roles and responsibilities of different institutions have not been refined.

Generally, legislative framework and subsequent regulations related to safeguarding a proper reflection of disaster risk reduction elements, including prevention, mandatory identification of risks in the sectorial development plans need to be improved and enforcement mechanisms refined.

The legislative framework governing spatial and land use planning in Georgia does not include clear requirements for incorporation hazard identification and related risk and vulnerability assessment and does not establish certain restrictions within identified high-risk areas in order to facilitate protection from hazards already within the planning process.

Governmental Resolution Nr. 260 “on approval rules of preparation of spatial and urban development plans”, that represents guiding document for development and approval of spatial and land use plans, requests the preliminary research to be conducted and specifies its content and structure, however, it does not include the definitive list of hazards to be taken into consideration. Annex IV of the Resolution lacks details on hazards, risks, and vulnerability assessment, including maps and models, as well as the detailed information on the specifics of hazard risk maps/risk assessment plans and on the baseline data the maps/plans should be founded.

65 The Ordinance of the Government of Georgia on preparing procedures for developing the emergency risk management plan, №453, 2017 available at: https://matsne.gov.ge/ka/document/view/3824640?publication=0

66 The Ordinance of the Government of Georgia on preparing procedures for developing the emergency management plan, №452, 2017 available at: https://matsne.gov.ge/ka/document/view/3824640?publication=0

The existing Resolution recommends updating hazard maps and risk assessment plans every 10 years for high level plans and every 2 years for the low-level plans. The legal requirement of updating/revising the risk assessment plans and hazard maps are not aligned with the periodicity of assessment and mapping of each type of hazards, and linkages to the standard methodologies for mapping of each hazard are not provided. The procedure of reviewing draft spatial and land use plans from the point of identification of natural hazards and assessment of risks is not defined, neither the responsibilities of relevant institutions are specified accordingly.

The procedure of review the draft spatial and land use plans is also connected to the strategic environmental assessment (SEA). There is no guiding manual/checklist for ensuring that hazard and disaster risk assessment considerations are well represented within the plans.

Georgian legislation, in particular the Law on Public Safety, does not include legal definition of "critical infrastructure". It is advisable to add the definition and to draft the secondary legislation (ordinance of the Government of Georgia determining "the list of facilities of vital importance and the emergency prevention and response requirements on the facilities") respective to the new definition. It would be useful to consider and examine the definition that is included on the EU Directive 2008/114/EC on critical infrastructure. In terms of infrastructure that can be impacted by a hazard, the existing legislation should be reviewed in order to ensure that hazards risk is considered in the planning, use and maintenance of CI. For example, risk and vulnerability model, being developed by the UNDP project, is aligned with the EU categories of CI and the prescribed approaches to calculating risk, damages, and losses to those categories of infrastructure, from hazards.

It is also recommended to ensure compatibility of the criteria provided for the identification of the "potentially dangerous facilities" for the Municipality Safety Passport, with the definition of "critical infrastructure".

8. LEGAL FRAMEWORK RELATED TO CONSOLIDATION OF RISK INFORMATION

When examining the framework for assessment of Consolidation of Risk Information, the WMO Disaster Risk Knowledge Checklist recommends taking into accounts the following:

- Central standardized repository (including but not limited to a Geographic Information System) established to store all event/disaster and risk information.
- National standards (where possible, following international standards) established for the systematic collection, sharing and assessment of risk information and data related to hazards, exposures, vulnerabilities, and capacities.
- Standardized vulnerability data and information disaggregated by sex, age, and disability.
- Process established to maintain, regularly review, and update risk data, including information on any new or emerging vulnerabilities and hazards, with roles and responsibilities of stakeholders identified along with appropriate funding.

8.1 Data Collection and Information Management

The Central standardized repository for all event/disasters and risk information (including geographic information system) is vital part of any well-functioning DRR and MHEWS system. The database established to store consolidated risk information and data related to hazards, exposures, vulnerabilities, and capacities enables utilization of the data for decision-making on prevention and when required during emergency. National standards should be established for the systematic collection, sharing and assessment of information and data to be stored in the repository.

Formation of the national spatial data infrastructure is one of the requirements of the European Union for its member states (Directives of the European Parliament and European Council on the Infrastructure of Spatial Information in Europe - INSPIRE). According to the INSPIRE Directive, the geo-information sector, its legal framework, and administrative issues should be brought into compliance with the European standards. According to the National Disaster Risk Reduction Strategy of Georgia (2017-2020)[67], free access to geographic information is a necessary precondition for healthy and sustainable social development. *"For this reason, the Georgian Government, similarly to the EU member states, decided to create, and develop the national spatial data infrastructure in order to promote and improve access to the country's geographic data. Georgia is the first country in the Caucasus region that started creating a national spatial data infrastructure compatible with the European standards and thus made one more step towards the European integration. Spatial data infrastructure will be widely used, including for the purpose of disaster risk reduction and response.*

67 National Disaster Risk Reduction Strategy of Georgia 2017-2020 and its Action Plan approved by Resolution N4 of The Government of Georgia in January 2017 available at: https://matsne.gov.ge/ka/document/view/3547798?publication=1

In this regard, one of the most important DRR policy directions is the implementation of geospatial and space technologies and related services in the DRR system. As a result, the Georgian Government, private sector, academic community, and general public will receive access to non-sensitive data. Besides, relevant Georgian institutions will be able to store information received, as a result of concrete local and distant observations of the earth and climate and evaluate and model disaster risks."

In 2013, the Government established a Commission in order to develop National Spatial Data Infrastructure (NSDI) in Georgia. By its decree[68], the Government mandates the National Agency for Public Registry of the Ministry of Justice to coordinate National Spatial Data Infrastructure (NSDI) development, to form the Secretariat to the NSDI State Commission, and to establish and coordinate thematic working groups. Currently, six groups are established: (1) legislation, (2) public relations, (3) business model, (4) GIS, (5) IT and (6) education. Article 3 of the decree requires the NSDI to comply with the INSPIRE Directive[69]. Article 4 entitles all Ministries represented in the NSDI State Commission to ensure the participation of their representatives along with representatives of their subordinated bodies and legal entities in the thematic working groups. The ministries are further requested to provide legal, administrative, and technological support for effective implementation of activities of the thematic working groups. The Commission and the working groups are responsible for formulating, promoting, and overseeing the effective implementation of state policy on NSDI. The key state institution for the creation and implementation of NSDI is the Agency of e-governance (restructured Data Exchange Agency) under the Ministry of Justice. The Agency was created in June 2020[70] with the aim to implement e-governance principles and to ensure interoperability of informative-communicative technologies used in Georgia. Among the main functions of the Agency are the management and development of the unified data exchange system (infrastructure) and setting common standard for data exchange within this system. The agency is also responsible for development of a unified state register of information, coordination of the establishment and implementation of a unified standard for the databases, registers, services, and information systems.

As of today, Georgia has developed its own metadata standard for the publication of open data. The integration of the standard with the European standard DCAT-AP[71] would require adaptation to capture additional metadata and enhance the technological solution for metadata exchange with the European Open Data Portal. Spatial metadata is based on ISO 19110/19115/19119/19139 and spatial technological solutions are integrated according to the INSPIRE Directive. The current standard requires a high number of fields to be

68 Decree of the Government No. 262 of 9 October 2013 on the Establishment of the governmental commission on the development of the National Spatial Data Infrastructure in Georgia https://matsne.gov.ge/ka/document/view/2044006?publication=2

69 European Commission, INSPIRE Knowledge Base, INSPIRE Directive, available at: https://inspire.ec.europa.eu/inspire-directive/2

70 Law on legal entity under public law – Agency of Digital Governance, 2020 available at: https://matsne.gov.ge/ka/document/view/4893222?publication=0

71 The DCAT Application Profile for data portals in Europe (DCAT-AP) is a specification based on the Data Catalogue Vocabulary (DCAT) developed by W3C. https://joinup.ec.europa.eu/solution/dcat-application-profile-data-portals-europe

filled, resulting in a complicated preparation process for spatial metadata. In terms of statistical metadata, the National Statistics Office does not publish any metadata for statistical environment information datasets. Statistical metadata is based on the Statistical Data and Metadata Exchange (SDMX) standard.[72]

The National Agency of Public Registry has elaborated a draft Law on the National Spatial Data Infrastructure (NSDI), which is mostly focused on data sharing and not data processing. The NSDI process considers the requirements of the INSPIRE Directive, yet the requirements are adapted to the Georgian reality. The INSPIRE directive, along with multiple standards, establishes data models, according to which data must be shared. The implementation of this particular requirement of the Directive cannot be ensured in Georgia since there is no data sharing and fundamental data/basic data and additionally generation of the fundamental data is not taking place as such. Therefore, data generation models of the INSPIRE Directive are not reflected in the NSDI process. The NSDI system in Georgia aims at sharing data from a common point through GEO Portal, and subsequently a gradual transition to the standardization of data models. The first stage required launching of GEO Portal in testing mode, the data of the National Agency of Public Registry was planned to be included in the portal, the agency itself owns approximately one hundred data sets. Additionally, the data from 5 to 6 other agencies were to be included as well, those are the following institutions: the National Agency for Cultural Heritage Preservation, the National Environment Agency, the Agency of Protected Areas, and Tbilisi City Hall. The first phase aimed at demonstrating the benefits of the system to stakeholders. In the second phase, the elaboration of the memorandum/agreement on data sharing was planned, where each agency would declare its readiness for participating in the data sharing process. The attachment to the memorandum would list the data sets produced by the agencies involved in the process and the time frame according to which they would publish the data on the GEO Portal. Technical annexes to the memorandum were considered to be a critical part of the document. The first annex meant to contain a list of data to be part of NSDI. In this context, two options were discussed: I. 32 thematic data sets (ANNEX I, II, III) of INSPIRE directive; II. ARGIF an alternative of INSPIRE. Both options have their list of data sets. The third phase called for a process of data modelling and data processing for each agency involved in the process.

Emergency Management Service (EMS), which holds data on police and fire-rescue offices, is involved in the process. At this point only sufficient financial resources are required for the continuation of the process, which has been suspended for the last one year. NSDI had a strategy and action plan for 2016-2019, which was partially fulfilled. The agency began working on the new strategy and action plan 2020-2021. the working/draft version of the document is not currently available.

8.2 Reporting Requirements by Institutions

Article 20 of the Law of Georgia on Public Safety,[73] defines how to keep records of incidents/emergency situations and of their effects: *"(1) For the purpose of emergency prevention, readiness for an emergency situation and emergency response, the Emergency Management Service shall establish and maintain a*

72 The official site for the SDMX community, available at: https://sdmx.org/?page_id=3425

73 Law of Georgia on Public Safety 2018, available at: https://matsne.gov.ge/en/document/view/4243170?publication=2

unified information bank, where information on the expected and occurring emergency situations and on the response forces of the subjects of the National System shall be reflected, as well as the data on safety passports of potentially hazardous facilities and other data, kept by the subjects of the National System that are necessary for preparing an analysis on the current situation in the field of public safety. (2) Official statistical records, analysis and the state statistical reporting of incidents/emergency situations and their effects shall be carried out by the Emergency Management Service. (3) The procedures for registering an incident, and an expected or an occurring emergency situation and their effects, and the procedures for processing the data shall be determined by the Government of Georgia. (4) Observance of the procedures for registering an incident, and an expected or an occurring emergency situation and their effects, and for processing the data, shall be obligatory for the public authorities, bodies of the Autonomous Republics and municipalities, as well as for natural and legal persons carrying out entrepreneurial activities". To achieve this goal, the Law obliges the Government of Georgia to issue the Ordinance, which will regulate *"the procedures for registering an incident, and an expected or an occurring emergency situation and their effects, and the procedures for processing the data"*. The ordinance should have been approved by 1st January 2021, but the deadline has been postponed until January 1st 2022[74]. Due to the fact that the Ordinance is not issued yet, we can only discuss the key details it should include in theory. Nevertheless, it is important to determine those aspects and based on them, organize consultations with the EMS and the Ministry of Internal Affairs to ensure that the Ordinance creates a legal base for data collection and procession. First of all, the Ordinance of the Government of Georgia on "the Approval of the Procedure for Registering an Incident/Expected or Occurring Emergency Situation and its Effects and for Processing the Data" shall exhaustively enumerate all the stakeholders (public authorities, administrative bodies, bodies of the Autonomous Republics and Municipalities, as well as private legal entities), which will have the obligation to send the requested data to EMS. Herewith, the Ordinance should determine what kind of information is to be expected/requested from different stakeholders (for example, National Agency of Public Registry[75] - cadastral, administrative, environmental, infrastructural, business, orthophoto data). Moreover, in order to ensure that the Information system is updated periodically, it is recommended to include more precise obligations of stakeholders to provide the requested information (for example, impose deadlines and draft that they (or individually differently) "are obliged to provide information no later than ...."). It is important to ensure that the requested, proceeded, and stored information should follow the national metadata standards established for the systematic collection, sharing and assessment of information and data within NSDI.

Apart from the ordinance, it is also important to draft the necessary amendments in Article 40 (Powers of EMS) of the Law of Georgia on Public Safety, particularly, in sub-paragraph b) and emphasize more clearly that EMS has a power to request available information from the legal entities under private law (legal entities carrying out entrepreneurial activities).

74 The amendment to the Law on Public Safety, Dec 2020 available at: https://matsne.gov.ge/ka/document/view/5063538?publication=0

75 LEPL National Agency of Public Registry, See: https://napr.gov.ge/p/640

The other information systems, administered by different institutions and the data stored in them could be crucially important for MHEWS. For instance, this is truth for the information collected and controlled by NEA. Governmental Decree Nr.502 (2018) approves types and fees for services provided by NEA[76]. The annexes to the decree define the services and data that are provided by the National Environment Agency for a fee. They include the types of services related to the provision of geological data, environment pollution monitoring data, hydrometeorological and hydrological data, climate data and studies, and specific flora assessment. Annex 15 of the same decree also defines the list of data and information that can be obtained free of charge. The decree was last revised in 2019. Data can be requested by anyone under the condition of signing a contract with the National Environment Agency. The contract must define the scope and volume of the work including the fee of the service. Article 3 of the same decree mentions that the costs related to information access are not applicable to the Ministry of Environmental Protection and Agriculture, the Ministry of Justice, the Prosecutor's Office of Georgia, the Ministry of Internal Affairs, the Ministry of Defence, some departments within the Ministry of Finance, the State Audit Office or the Ministry of Economy and Sustainable Development.

The Spatial Planning, Architectural and Construction Code envisages the development of the Spatial Planning and Urban Planning Information System (Article 14)[77], the purpose of which is to create the most complete and objective information and data for spatial and urban planning. The Spatial and Urban Planning Information System is maintained at the central government and at the municipality/municipalities levels, which may be based on various information bases in the field. At the central level, the spatial planning and urban planning information system is managed by the relevant body authorized in the field of spatial planning. The administrative body with planning authority at the local level is obliged to organize the management of the spatial planning and urban planning information system within its area of operation and to provide all the information at its disposal to the central information system management body. The central management body of the Spatial Planning and Urban Planning Information System shall systematize and / or process the data provided by the administrative body with planning authority and / or other body and / or information obtained on its own initiative. The Government of Georgia shall authorize the administrative body to manage the spatial planning and urban planning information system and shall determine the rules for organizing and managing this system. It is important that the established rules follow the national standards for metadata and interoperability in order to be used also outside of the Spatial Planning and Urban Planning Information System.

Finally, the Law on Environmental Protection states the requirement that every four years the MEPA should publish a "National State of the Environment" report. The publication and dissemination should be financed from the state budget (Article 14). In order to produce the report, the law foresees that state bodies and legal entities under public law shall provide information on the environmental conditions to MEPA free of charge and that it is available to them no later than two months after a request is made. No platform is specified regarding the publication of this report.

76 Decree of the Government of Georgia No. 502 of 18 August 2014 on the approval of the "Types and fees for services provided by the public legal entity under the Ministry of Environment Protection and Agriculture of Georgia – National Environment Agency" available at: https://www.matsne.gov.ge/ka/document/view/2465275

77 Law of Georgia - Spatial Planning, Architectural and Construction Code of Georgia 2018 available at: https://matsne.gov.ge/ka/document/view/4276845?publication=8

8.3 Database of the Information System

In order to support integration of disaster risk-related information and databases into the National Spatial Data Infrastructure (NSDI) on Georgia, UNDP is assisting Government with the development of the Centralized Multi-Hazard Disaster Risk Information System (MHDRIS). MHDRI represents means by which individuals, communities and public authorities in Georgia have access to relevant knowledge and timely comprehensive information on all aspects of disaster risks, including hazards, exposure, vulnerability, and capacity, related to persons, communities, organizations, and their assets. It will consist of a national e-Library, databases (including the GIS database), information systems and knowledge portal (web knowledge portal) to increase awareness, provide interactive hazard maps, with integration of social media and possible mobile application to increase community engagement and allow two-way flow of information. As part of the NSDI, it will provide the information access and sharing platform for geospatial information on hazards for use by all sectors. Further it could be considered the case when the MHDRIS to be integrated as a key Subsystem/Module in a multi-hazard early warning system as the first Risk Knowledge component which enables the management and access to relevant knowledge in order to provide the understanding about each managed hazard, risks, vulnerabilities, and priorities.

While MHDRIS requires collecting data from different stakeholders (from public and private sector), it is important to determine, if any legal circumstance can hinder this process and how can this challenge be tackled. To get the comprehensive picture for the data integration/exchange process, it is crucial to analyse the information system (especially, information gathering process) from different angles.

Personal Data

The goal of the Law of Georgia on Personal Data Protection[78] is to ensure the protection of privacy in the course of personal data processing. For this purpose, the law defines some of the basic terms for the personal data procession. The most important terms are personal data and special categories of data, which are defined as follows:

"a) ***personal data*** *– any information connected to an identified or identifiable natural person. A person shall be identifiable when he/she may be identified directly or indirectly, in particular by an identification number or by any physical, physiological, psychological, economic, cultural, or social features specific to this person.*

b) ***special categories of data*** *– data connected to a person's racial or ethnic origin, political views, religious or philosophical beliefs, membership of professional organisations, state of health, sexual life, criminal history, administrative detention, putting a person under restraint, plea bargains, abatement, recognition as a victim of crime or as a person affected, also biometric and genetic data that allow to identify a natural person by the above features".*

78 The Law of Georgia on Personal Data Protection, Date of issue: 28/12/2011, Available at: https://matsne.gov.ge/ka/document/view/1561437?publication=22

Personal data is a broader term than special categories of data. Theoretically, it is hardly imaginable and almost impossible that EMS might need and request the information, which may include special categories of data. It is also hardly anticipated, yet more possible, that EMS might request the information, which may include personal data. If this scenario occurs and EMS needs and requests the information, which includes personal data, the way to resolve this problem is the Article 5 of the Law of Georgia on Personal Data Protection, which determines legally admissible grounds for personal data processing. For MHDRIS purposes, relevant legally admissible grounds are cases, when personal "data processing is provided for by Law" or when personal "data processing is necessary for a data controller to perform his/her statutory duties". These grounds are relevant for MHDRIS, because on the one hand, the necessity of data processing is declared by the Law of Georgia on Public Safety and on the other hand, EMS as a data controller needs to perform its statutory duties, when it requests the information (even if this information contains personal data).

Consequently, EMS can have the right to request and get the information necessary for the functioning of MHDRIS, even if this information contains personal data.

Commercial Secret

Commercial secret is defined and regulated by the General Administrative Code of Georgia[79]. Under the Article 272, commercial secret is an *"information on a plan, formula, process, or means of a commercial value, or any other information used for manufacturing, preparing, processing of goods or rendering services, and/or is a novelty or a significant result of technical activity, as well as other information that may prejudice the competitiveness of a person if disclosed"*. This definition is quite broad, however, not all the information falling within this scope, is considered as commercial secret for the General Administrative Code's purposes. Two different scenarios could be discussed:

a) The case when the information is requested from an enterprise/organization, which considers that the demanded information contains commercial secret (for example, when EMS requests the information from MagtiCom LTD).
b) The case when the information is requested from an administrative body about an enterprise/organization and the requested information contains commercial secret regarding this enterprise/organization (for example, when EMS requests the information about MagtiCom LTD from the National Communications Commission of Georgia).

In the first scenario, an enterprise/organization is not able to reject the request and is obliged to give the requested information (if it is necessary for MHDRIS) to EMS, because EMS has a statutory right to request the information under the Law of Georgia on Public Safety. However, while submitting the requested information, an enterprise/organization is obliged to specify that the information (or part of the information) contains a

79 General Administrative Code of Georgia, 1999, Article 272, available at: https://matsne.gov.ge/en/document/view/16270?publication=26

commercial secret. After that, EMS, as an administrative body, under the Article 272, will have the obligation to consider if the specified information falls within the scope of the commercial secret's above-mentioned definition or not. If EMS decides that the information cannot be considered as a commercial secret, it should make the information open and shall immediately notify the respective enterprise/organization. The information shall become open 15 days after making this decision, unless an enterprise/organization, as an owner of this information, appeals the decision to a superior administrative body, or as the Administrative Procedure Code of Georgia determines into a court. An enterprise/organization must immediately notify EMS of the appeal. Consequently, it is obvious that if EMS requests an information from an enterprise/organization and the information contains commercial secret, the process of the data transmission will not be hindered, and EMS will have the obligation to consider the information (or part of the information) as a commercial secret and keep this information confidential.

In the second scenario, the situation is more complicated, because EMS requests an information from an administrative body, which has already gone through the process described above (for considering information as commercial secret) and keeps someone's information as confidential. The administrative body, which keeps information containing commercial secret, does not have the legal power to give this information to EMS, without a prior consent of the information owner (enterprise/organization). Therefore, in this case, the way to tackle this legal challenge could possibly be demanding the information from this enterprise/organization itself, rather than from the administrative body, which keeps it confidential.

In this light, it is also worth mentioning that information about an administrative body shall not be considered as commercial secret. It means that, even if the legal entity is under private law, if it exercises authority under public law (for example, JSC Georgian State Electro system or JSC Electricity Market Operator), it is considered, as an administrative body for General Administrative Code of Georgia and information about these entities is not allowed to be considered as commercial secret.

To sum up, for MHDRIS, commercial secret can be considered as an obstacle, only when the information (about enterprises/organizations) is requested from an administrative body, which keeps commercial secrets of enterprises and organizations. However, based on the nature of the information, which are intended to be collected and integrated in MHDRIS, it is hardly possible, that this information will contain commercial secret and this challenge will practically occur in reality.

State Secret

The Law of Georgia on State Secrets[80] defines state secret and sets relevant regulatory rules for it. According to Article 1, state secret means "information available in the areas of defence, economy, foreign relations, intelligence, national security and law enforcement, the disclosure or loss of which can prejudice the sovereignty, constitutional order, political and economic interests of Georgia or of any party to the treaties and international agreements of Georgia and which, according to the Law of Georgia on State secret and/

80 The Law of Georgia on State Secrets, Date of issue: 19/02/2015, Available at: https://matsne.gov.ge/ka/document/view/2750311?publication=6

or treaties and international agreements of Georgia, is predetermined as classified or deemed to be a state secret, and is subject to state protection". State Secrets are classified into 4 categories: (a) Of Exceptional Importance; (b) Top Secret; (c) Secret; (d) For Limited Use. Despite this classification, the chapter V of this law determines the possibility for granting access to state secrets. Article 19 clearly states that "Security clearance for state bodies/legal persons to access a state secret shall be issued to those state bodies, enterprises, institutions, or organizations (irrespective of their legal form) that have physical, technical, and organizational capabilities to properly handle the information containing a state secret and that need to know this information". The authorised structural unit of the State Security Service of Georgia has the right to decide on granting state bodies/legal persons access to state secrets according to the results of the security background investigation and issue relevant permits for not more than five years. Consequently, for the MHDRIS purposes, if EMS applies for grating permit from the State Security Service, it can have the right to demand and get the information from stakeholders, which may contain state secret as well. EMS can easily satisfy all the legal requirements for getting above permission, because MHDRIS may need this information for a high public interest, society benefit and state's safety maintenance. Moreover, based on the relevance of this information system, it can be arranged in a way to ensure the proper supervision on state secrets.

Furthermore, it is worth mentioning, that before EMS begins executing its supervisory role and managing the information system of multi-hazard disaster risk management, the database (the software, interface, etc.) might need to be developed by a private company (local or international), that has experience in developing similar information systems. In this developing process, if the above-mentioned company requires information containing state secret, then the access on state secrets can be considered as an obstacle. On the one hand, if the selected company for developing MHDRIS is local, then it will be easier to handle this challenge. According to the Law of Georgia on State Secrets, there exists a possibility for a private legal entity (enterprise) or organization to apply to the State Security Service of Georgia in order to get a permission after satisfying the mandatory requirements (having physical, technical, and organizational capabilities to properly handle the information containing a state secret and having a necessity to have the access and know this information). On the other hand, if the selected company for developing MHDRIS is international, it will be harder to get the access on information containing state secret. Based on Article 30 of the Law of Georgia on State Secrets, there exists a statutory restriction on the transfer of state secrets to residents of other states. The only legal base for transferring state secret to residents of other states is the existence of the treaty or international agreement ratified by the Parliament of Georgia or on the basis of a reasoned decree of the Government of Georgia.

Information Security

The Law of Georgia on Information Security[81] identifies mechanisms for information security maintenance and determines LEPL Digital Governance Agency (former LEPL Data Exchange Agency) as a supervisory body on information security sphere. This law sets certain rules in accordance with international standards (laid

81 The Law of Georgia on Information Security, Date of issue: 05/06/2012, available at: https://matsne.gov.ge/ka/document/view/1679424?publication=4

down by International Organisation for Standardisation (ISO) and the Information Systems Audit and Control Association (ISACA)), which are obligatory to be performed by critical information system subjects. The list of critical information system subjects is approved by an Ordinance of the Government of Georgia[82]. According to this Ordinance, the Ministry of Internal Affairs is considered as a critical information system subject, therefore, EMS, as a state sub-agency under the auspices of the Ministry of Internal Affairs of Georgia, is also considered as a critical information system subject and requirements of the Law of Georgia on Information Security (namely, adopt internal rules for information security that meet the minimum requirements for information security (based on the criticality classification of the critical information system subject) that are defined by the Digital Governance Agency in accordance with the standards and requirements laid down by the International Organisation for Standardisation (ISO) and the Information Systems Audit and Control Association (ISACA), determine the person(s) or the employee(s) (Information Security Manager) responsible for observing the information security requirements, etc.) also apply to EMS.

8.4 Identified Gaps

To enable possibility of consolidation and storage of risk information (including geographic information system) and data related to hazards, exposures, vulnerabilities in the central standardized repository, it is mandatory to consider the aspect of cross-sectorial integration of the information at the stage of collection of the differentiated data. Currently, the national standards for the systematic collection, sharing and assessment of information and data to be stored in the repository, that also would be compatible with the metadata standards, are not established. Also, there is no revised organizational framework in the area of the data exchange (hazards, meteorology, hydrology, topography, soil characteristics, vegetation, settlements, existing infrastructure, population, and available socio-economic and material resources, as well as disaster risk assessment, vulnerability assessment, etc.) The creation of the enabling legislative and institutional framework for a well-functioning information system like MHDRIS is needed.

82 Ordinance of the Government of Georgia on the Approval of the List of Critical Information System Subjects, №312, Date of issue: 29/04/2014, available at: https://matsne.gov.ge/ka/document/view/2333175?publication=1

9. LEGAL FRAMEWORK RELATED TO INCORPORATION OF RISK INFORMATION INTO THE EARLY WARNING SYSTEM

When examining the existing framework for incorporation of risk information into the early warning system, the WMO Disaster Risk Knowledge Checklist recommends taking into accounts the following:

- Information on the geographical extent of hazards used to define safe areas and evacuation zones.
- Risk information on vulnerable groups (hazard, exposure, differential vulnerability) used to identify and define evacuation routes and location of temporary shelters.
- Risk information on different types of assets reviewed to outline procedures to minimize damage or loss of such assets once a warning is issued.
- Process established for continuous update on new or emerging risks (e.g., due to urban expansion or establishment of new settlements) and potential changes to some hazards (due to changes in land use) to update safe areas, evacuation zones and shelters disaster risk management review.
- Disaster risk preparedness review.

9.1 Emergency Management Plans

The relevant reference legislation includes Article 5 of the Law on Public Safety and the Governmental Ordinance Nr. 452, the subordinated legal act under this Law. Article 5 of the Law on Public Safety obliges the bodies of the National Public Safety System to perform the following (among others):

- plan and carry out emergency prevention measures, as well as plan and carry out the measures intended to reduce emergency situation risks;
- develop a warning system for incidents/emergency situations, as well as develop an early warning system;
- timely transmit a warning regarding an incident/emergency situation and information regarding the rules of conduct during an incident/emergency situation;
- promote safe and stable operation of a facility of vital importance;
- develop an emergency management plan;
- ensure the training of the citizens of Georgia in the field of public safety and raise their awareness regarding emergency situations.

The Ordinance of the Government of Georgia nr. 452 "on preparing procedures for developing the emergency management plan"[83] Includes the requirements related to 4 stages of the development of the Plan: First

83 The Ordinance of the Government of Georgia on preparing procedures for developing the emergency management plan, №452, Date of issue: 6/10/2017, Available at: https://matsne.gov.ge/ka/document/view/3824640?publication=0

stage – assessment of potential emergency situation and forecasting outcomes of emergency situation; Second stage – assessment of prevention of emergency situation, state of readiness to respond, emergency response forces (hereinafter referred to as response forces) and resources; Third stage – planning of emergency response; Fourth stage – planning of recovery operations.

The required Structure of the Emergency Management Plan is annexed to the Ordinance and includes: - Emergency Situation Threat Analysis; - Emergency Situation Risk Assessment; - Emergency Situation Risk Assessment Methodology; - Emergency Situation Potential Development Scenario Description.

The Ordinance specifies the information, which should be incorporated in the emergency management plans in order to be used for disaster readiness and early warning system functioning. The required information should be processed, evaluated, and presented in the plan. The respective activities include:

a) Collection, processing, and creation of information database of data on potential emergency situation and resources of relevant agencies/organizations.
b) Establishment of type and scale of potential emergency situation.
c) Determination of risk based on risk plan. Determination of possible locations of destruction and damage on given territory considering ecological, social, economic, geological, hydrometeorological, seismic, and other local conditions.
d) Disclosure of weak points of cables, pipelines and other communication networks based on engineering geology and hydrology maps.
e) Forecasting of secondary outcomes of potential emergency situation that is threatening for human life and health.
f) Determination of scale of destruction of facility, including, water and electricity supply, roads, airports.
g) Determination of possible number of damaged/diseased people as a result of potential emergency situation.

Based on the results of the first stage information collection and assessments the following planning activities should be conducted:

a) Assessment and development of preventive measures.
b) Determination of type of response forces, its number, capacity, including communication means, tasks, routes, location, centres of field operation, appropriate operative centres determined under the Law of Georgia on Public Safety and institutions of executive government and/or emergency headquarter.
c) Determination of necessary resources for the action of response forces, including need of rescue equipment and medicines.
d) Development of readiness for an emergency situation.

The Ordinance envisages the usage of the information maps during the development of the plan. The following maps are included:

1. The forecasting maps on outcomes of emergency situation threat, energy supply network, ensuring logistics and possible emergency situations shall be used during the development of plan.
2. Energy supply and logistics maps are created during the emergency situation in order to provide the facility with energy, water and ensure it with necessary measures for stable functioning. These maps depict territorial zones where the supply of necessary resources can be cut, as well as optimal, alternative routes for the supply of necessary resources. Energy supply and logistics maps are created in the close proximity of the facility not less than 10km radius around it.
3. Forecasting map for the potential emergency situation outcome is created based on the emergency situation risk map and the following is indicated:
   a) Possible locations of structure destruction.
   b) Areas of potential damage of communication systems.
   c) Fire and explosion hazardous areas.
   d) Location of possible contamination with chemical or radioactive substances.
   e) Possible locations of blocking movement routes and exits.
   f) Locations of possible flooding and moving rain-pipe and sewage waters above the ground.
   g) Zones dangerous for human life, including high voltage power transformer stations.
   h) Structures of strategic importance: bridges, tunnels, highways, railways, seaports, metro, electricity supply stations, and water reservoirs.

In addition, the following information should be annexed to the Emergency Management Plan:

a) Document on creation of appropriate body managing response to emergency situation and rights and responsibilities of its members.
b) Map of the territory/facility including the threats and risks.
c) Notification scheme of operative centres determined under the Law of Georgia on Public Safety, emergency headquarters of executive government agencies and/or facilities.
d) Evacuation plans from the territory or the buildings.
e) Early notification scheme of population on emergency situation, including local notification scheme.
f) Scheme of ensuring energy supply network and logistics.
g) Roster of firefighting technique and equipment.
h) List of individual protection means.
i) Prevention and liquidation plan for the spillage of oil and oil products developed by those facilities that perform oil operations determined under the law of Georgia on “Oil and Gas”.

The plan and its annexes should be publicly available, except the secret information.

9.2 Identified Gaps

The information requirements for the preparation of the Emergency Management Plans are vast and quite complicated to handle. The obliged bodies of the National Public Safety System might face certain difficulties in collecting and assessing the required information needed for the development of the Emergency Management plans. The same applies to the usage and creation of the various maps. The capacities of EMS, that is responsible for organizing and supervision of the preparation of the Emergency Management and Emergency Risk Management plans, to create the respective help desk, are not sufficient. The help desk could provide assistance with the provision of the baseline information and act as a depository for the existing Emergency Management Plans.

Also, the detailed guiding documents for assisting and enabling the development of the specific parts of the plans are lacking.

The procedure of continuous review and update of the Emergency Management Plans is not established and the responsibilities of state institutions, beside the EWS for reviewing the plans are not defined.

10. LEGAL FRAMEWORK RELATED TO ROLES AND RESPONSIBILITIES OF STAKEHOLDERS

When assessing the existing institutional set up and the roles and responsibilities of stakeholders, the WMO Disaster Risk Knowledge Checklist recommends taking into accounts the following:

- Key national government agencies involved in risk assessments (including hazard, vulnerability, and capacity assessments) are identified and roles defined.
- Legislation or government policy mandating the preparation of hazard, vulnerability and capacity assessments for all areas are in place.
- Responsibility for coordinating hazard identification and risk information (exposure, social and physical vulnerability, and capacity) assigned to one national organization with a view to consolidating approaches and monitoring linkages and cascading impacts.
- Process developed for scientific and technical experts to assess and review the accuracy of risk data and information.
- Process developed to actively engage rural and urban communities in local hazard and risk assessments taking into consideration the needs of all people (women, children, older people, people with disabilities, etc.)

For a (multi-hazard) early warning system to operate effectively, national, regional, and local governments and vulnerable groups should create an integrated and comprehensive framework, which clarifies the roles, responsibilities, and relationships of all stakeholders within the system[84]. Thus, the important step in the review of the legal and institutional frameworks of risk knowledge component was to identify all stakeholders that contribute to the sections listed under the Risk Knowledge component.

Within Georgian legal framework, the Institutions involved, directly or indirectly, in civil protection in general, are listed and their roles are regulated by the Government Ordinance No. 508[85] – on approval of the National Civil Safety Plan, which is the key guideline document for Georgia's unified emergency management system. The stakeholders represent the following groups: National Government, Local Government.

10.1 National Level Governmental Institutions

National Government is responsible for the high-level decision-making, development of policies and legislation and for setting up the implementation framework. National government interacts with regional and international organizations and agencies to strengthen early MHEWS capacities and ensure that

84 MHEWS: Checklist, WMO 2018

85 Ordinance of Government of Georgia No. 508 – on Approval of the National Civil Safety Plan 2015, available at: https://matsne.gov.ge/ka/document/view/2993918?publication=1

warnings and related responses are directed towards the most vulnerable population. Providing support to local communities and governments to develop operational capabilities is also an essential function.

The National Security Council (NSC) - The highest political decision-making and consultative body to the Prime Minister of Georgia to ensure state security and crisis management. The statutory responsibilities of the NSC are given in Article 192 of the Law of Georgian on Planning and Coordination of the National Security Policy[86]. The Council develops proposals to prevent and eliminate the consequences of certain events that pose a threat to Georgia related to political, defence, social, economic and security policy; develops recommendations and proposals for making political decisions, and provides organizational, informational, and analytical support to the Prime Minister. It is responsible for coordination of development of the national level conceptual documents, Threat Assessment Document and Georgia's National Disaster Risk Reduction Strategy among them. The Council comprises National Crisis Management Centre and operates National Situation Room for ensuring effective coordination of national scale crisis. The National Situation Room is a physical facility equipped with modern communication and technical means, which is activated during the national level crisis situation and is managed by the Prime Minister of Georgia.

The Emergency Management Service (EMS) under the Ministry of Internal Affairs is the formally designated authority for coordinating and monitoring of the implementation of state policy in the field of public safety, including prevention, preparedness, along with response, recovery and rehabilitation works. The EMS carries out the National Public Safety Plan. It also identifies analyses and assesses risks on the permanent basis, plans and implements preventive measures and projects in cooperation with bodies of the public authorities. It is responsible for providing official statistics and state statistical reporting of emergencies. The EMS organizes the creation and development of an early warning system for expected or actual emergency situations, collects and processes necessary data within the system. EMS, through its Civil Protection Department is coordinating body for development of emergency management plans and emergency risk management plans. The functions of the Emergency Management Service related to the disaster knowledge management, by law of Public Safety shall be to:

- identify, analyse, and assess risks on the permanent basis, plan and implement preventive measures and projects in cooperation with bodies of the public authorities, Autonomous Republics, municipalities, and legal entities under public and private law, in order to minimise the emergency risks.
- organize the creation and development of an early warning system for expected or actual emergency situations; collect and process necessary data within the system.

Until January 1st, 2022, the Minister of Internal Affair should issue an order on establishing and functioning of **Expert Advisory Council**. The Council shall be established within the Emergency Management Service and shall comprise the representatives of the scientific and research fields and/or groups of sectoral experts in

86 Law of Georgian on Planning and Coordination of the National Security Policy 2015, art 19 available at: https://matsne.gov.ge/ka/document/view/2764463?publication=10

order to draw up a unified policy, develop the National System, assess the relevant risks, and plan preventive measures in the field of public safety. The membership of the expert advisory council shall not be paid.

The Ministry of Internal Affairs, besides others, operates the **Public Safety Management Centre 112**, which is responsible for providing assistance in emergencies, in coordination with other responsible bodies. Its responsibilities include receiving information on emergencies, processing this information and providing it to relevant entities to ensure an efficient response. The Centre is also responsible for delivering the necessary primary information to the caller before on-site assistance is delivered, and for raising public awareness on how people should behave in emergency situations.

The National Environmental Agency (NEA) under the Ministry of Environmental Protection and Agriculture of Georgia (MEPA) is responsible for monitoring and assessment of various geophysical natural hazards (geological (except of earthquakes), hydrological and meteorological). NEA provides the information to the National Security Council and all stakeholders including EMS through geographical bulletins that are disseminated monthly. NEA is also mandated to monitor ongoing hydrometeorological, geo-dynamic and geological processes; to make short, medium, and long-term weather and climate-induced hazard forecasts and to provide hazard maps and recommendations. In addition, NEA is also responsible for transposing the EU Floods Directive 2007/60/EC into the Georgian legal framework.

NEA's Department of Geology is responsible for monitoring and analysing of geological hazards (expert of earthquakes). The department includes the Division of Disaster Processes, Engineering-geology and Hydrogeology, Division of Geological Survey and Division of Response to Geo-ecological complications.

NEA's Department of Hydrometeorology is conducting Hydrometeorological monitoring and network maintenance. The Department comprises Hydrometeorological Risks Mitigation Division with the Unit of Hydrometeorological Forecasting Model Adaptation and Introduction and Unit of Disastrous Hydrometeorological Hazard Early Warnings, as well as the Division of Management of Databases.

Environment and Climate Change Department of MEPA assesses the impacts of climate change on the economy and the environment, develops national plans for adaptation to climate change and coordinates development of UNFCC climate change communications. The Department's experience with hazard mapping and application of computer modelling for climate change induced disasters is of great importance.

Climate Change Council is established[87] to coordinate the measures on climate change mitigation, GHG emission reduction and threat prevention caused by climate change in Georgia. The Minister of Environmental Protection and Agriculture leads the Council, while the members are the deputy ministers of other relevant Ministries. The Head of Coordination Team of the Covenant of Mayors' signatory municipalities and the

87 Ordinance of the Governmental of Georgia Nr.54 of 23 January 2020 on establishment of the Climate Change Council of Georgia, available at: https://www.matsne.gov.ge/ka/document/view/4780380?publication=1

Executive Director of Georgian Statistics Office also participate in the Council's work. The Ministry of Environmental Protection and Agriculture provide organizational and technical support to the Council, and its Climate Change Division of the Environment and Climate Change Department exercises the function of its secretariat.

The Environmental Information and Education Centre (EIEC) of MEPA is responsible for collecting and sharing information via multiple information sources (webpage, social media etc.) related to environmental protection, including information on disasters. The EIEC is a responsible party for large-scale education and outreach campaigns, including on DRR and on the multi-hazard early warning system.

The Agency of Internally Displaced Persons, Ecomigrants and Livelihood under the Ministry of Internally Displaced Persons from the Occupied Territories, Labour, Health, and Social Affairs (MoLHSA) is mandated to develop a system for the management of migration caused by natural hazards ("eco-migration") which provides monitoring of migration processes, prepares predictions, and implements resettlement processes induced by natural risks. It maintains a database of eco-migrants and develops adaptation-integration programs for them.

Emergency Situations Coordination and Urgent Assistance Centre under MoLHSA, provides urgent medical care in emergency situations, inter-hospital patient transfer throughout the country, except Tbilisi and Batumi. The purpose of the Centre is to coordinate the activities of emergency medical institutions, to improve their sustainability and safety assessment, to provide timely, adequate, and highly qualified emergency medical services, to coordinate medical transportation and deliver medical reserve for people affected by various disasters.

The Technical and Construction Supervision Agency under the Ministry of Economy and Sustainable Development is responsible for permitting of construction and supervision of functioning of "special industrial objects". The Agency oversees the implementation of technical regulations for the objects with increased technical risk. The information collected, and the databases owned and operated by the Agency are important for improving the legislation on critical infrastructure.

The National Agency of Public Registry (NAPR) of the Ministry of Justice is responsible for geodetic and cartographic works, including land registration, cadastre, and the setting up and operation of the Geographic Information System (GIS). NAPR operates the Web Map Service (WMS) and is developing a National Spatial Data Infrastructure (NSDI), a unified Geospatial information system in Georgia, with a single common Geoportal and relevant meta-databases in line with the EU INSPIRE directive.

Ministry of Regional Development and Infrastructure (MRDI) is responsible for development and coordination of implementation of a state policy on spatial planning, facilitation of development of master plans for land use, and development of technical methodologies for land use and spatial planning. The Ministry's

Natural Disaster Prevention and Rapid Response Unit is responsible for establishing and maintaining EWS for infrastructure and for increasing preparedness and response capabilities.

National Statistics Office of Georgia (GEOSTAT), the legal entity of public law, with its Executive Director, appointed by the Prime-Minister, carries out its activities independently. GEOSTAT is an institution, established by the Law of Georgia on Official Statistics (2009) in order to produce the statistics and disseminate the statistical information. It conducts statistical surveys, the census of the population and disseminates statistical data in observance of the schedule and secures the equal access to the statistical data for all the users[88]. GEOSTAT shall closely cooperate with the international and local organizations to achieve effective production of official statistics. The goal of international cooperation is to introduce the international practice and methodology and share relevant experience based on the agreements and treaties concluded with the international organizations, while cooperation with the local organizations means the cooperation and coordination of the Agency with the bodies producing the statistics. Full, desegregated, and trusted statistical information is of high importance at all stages of DRR for MHDRIS. Especially, it is vital for assessment, mapping and modelling of vulnerability and exposure and to be used during the development of disaster risk management plans and disaster management plans at all levels.

10.2 Municipal Level Governmental Institutions

Local Government is at the centre of effective DRR and early warning systems. They should be empowered by national governments, have considerable knowledge of the hazards to which their communities are exposed and be actively involved in the design and maintenance of early warning systems. They must understand advisory information received and be able to advise, instruct and engage the local population in a manner that increases public safety and reduces the possible loss of resources on which the community depends. Disaster risk assessment, management, response, recovery, and awareness raising on regional level falls within the competence of Local Governments and is coordinated by the EMS, which is also responsible for approving regional Emergency Risk Management and Emergency Management Plans. Municipalities should follow unified guidelines developed by central institutions and should use the comparable data for preparing their plans. EMS centres have been established in each major city and according to the system upgrade, due to be completed by the end of 2022, there shall be one regional EMS in each of 12 Georgian districts responsible for DRR coordination and communication. Each regional EMS shall be connected to the central digital system with DRR information. Since 2018, emergency management plans have been obligatory for each municipality. The responsibilities of municipalities related to disaster risk reduction and knowledge management includes: - Design and implementation of disaster prevention measures; - Development and approval of disaster risk management and disaster management plans together with the EMS; - Evacuation and shelter of affected people and distribution of humanitarian aid; Emergency response and recovery activities; and Awareness raising and training.

88 National Statistics Office of Georgia, official website: https://www.geostat.ge/en/page/about-geostat

The involvement of Municipalities in MHDRIS is vital because Municipalities have delegated power in public safety issues and herewith, emergency situations itself may be of local importance or of national importance. An emergency situation of local importance means if *"the emergency situation is expected, created and/or developed in the territory of a municipality(ies), for the management of which, depending on its nature, the response forces, and the means of a subject of the National System, or different response forces and means placed in the territory of one or several neighbouring municipalities are sufficient"*. Moreover, municipalities have to prepare municipality safety passport, which is *"a preliminarily developed document for assessing, in a municipality, the risk levels or possible effects of an emergency situation, or the activities carried out for emergency prevention by a body of the municipality, and for planning the development and implementation of measures intended for the reduction of the emergency risk"* and which will be a valuable information for MHDRIS. The rules and procedures of preparation of municipality safety passports are established by the Ordinance of the Government of Georgia on "the Approval of the Procedure for Preparing a Municipality Safety Passport"[89], issued in February 2021, which is a guideline document for Municipalities regarding safety passport.

10.3 Non-governmental Organizations

Non-governmental organizations help raise awareness among individuals, communities and organizations involved in early warning, particularly at the community level. They can also assist with implementing early warning systems and preparing communities for natural disasters. In addition, they can play an important advocacy role to help ensure that early warning stays on the agenda of government policymakers.

Georgia Red Cross Society (GRCS) is Georgian branch of International Federation of Red Cross and Red Crescent Societies (IFRC). It is voluntary, humanitarian, non-governmental and independent organization with an auxiliary role to public authorities in humanitarian work. It is mandated to coordinate the NGO response in emergency situations.

Caucasus Environmental NGO Network (CENN) has developed and hosts comprehensive renewable Web-Portal on Natural Hazards and Risks, which is user-friendly and can be assessed freely by everyone. However, the database is not officially backed-up by any governmental institution and there is no legal background for formalizing procedures of its further development and regular updating. The maps on the Portal date back to 2012 and are of very small scale (1:10000). The Risk Atlas is available online (Geoportal of Natural Hazards and Risks in Georgia) and as a separate publication. The Risk Atlas contains maps and explanatory text related to natural hazards, exposure, vulnerability, and risk in Georgia. The Atlas also shows the baseline maps of the natural and human conditions in the country. The maps show various types of vulnerabilities (physical, social, ecological, economic) and risks typical to Georgia's territory. Further popularisation of the Atlas is required, especially at the local level. The Atlas also needs to be periodically revised/updated.

89 Ordinance of the Government of Georgia Nr. 48 of 4th February 2021 on the Approval of the Rule for Preparing a Municipality Safety Passport. Available at: https://matsne.gov.ge/ka/document/view/5095237?publication=0

10.4 The Academic Community

The academic community is crucial for providing specialized scientific and technical input to assist governments and communities in developing and improving early warning systems. Its expertise is central to analysing natural hazards, vulnerabilities, exposure and risks, supporting the design of scientific and systematic monitoring and warning services, supporting data exchange, translating scientific or technical information into comprehensible messages, enhancing warning messages with additional information on potential impacts based on knowledge of the location of exposed elements and their degree and type of vulnerability, and disseminating understandable warnings to those at risk[90].

Hydrometeorology Institute of the Georgian Technical University - cooperates with NEA on regular weather forecasts and information/forecasts on hydrometeorological hazardous events.

The Seismic Monitoring Center of Ilia State University monitors and analyses seismic and co-seismic hazards. It cooperates with the Institute of Geophysics under Georgian Academy of Sciences and deals with seismic hazard and secondary natural hazards assessment caused by earthquakes.

10.5 Identified Gaps

While the institutional structure of DRR in Georgia is quite complex and incorporates considerably high number of organizations and stakeholders, making overall coordination challenging, the functional links, which exist between the institutes, are not clear and well defined. This may (a) incur discrepancies in how the competences and responsibilities of individual organizations and stakeholders are understood and fulfilled and (b) entail inconsistencies in the flow within the different components; this highlights the need for more transparent DRR structure as it implies that these functional links are not necessarily well-integrated within the existing legal and institutional framework. The sets of Standard Operational Procedures (SOPs or „protocols “) are missing in the majority of cases.

For Disaster Risk Reduction at Local Level, one of the priorities should be to introduce at the local level the methodology for identification, analysis, and assessment of natural disaster risks and to increase local capacities for implementing DRR measures. It is important that the local authorities assess risks on local level. This implies identification of type of risks, risk factors, probabilities, possible consequences, vulnerabilities, and priorities.

90 MHEWS Checklist, WMO 2018

11. PROPOSED LEGISLATIVE CHANGES AND RECOMMENDATIONS

Legislation framework existing in Georgia does not clearly establish rules, methodologies, and institutional arrangements for the management of disaster risk knowledge. Legislative gaps and needs for improvement have been identified related to all above-mentioned components of risk knowledge management. In order to address those gaps, the revisions and additions to the existing principal and subsidiary legislation as well as the development of new technical regulations and the related adjustments to the existing legal requirements are recommended. The new requirements should create a strong legal base for the subsidiary legislation (bylaws and regulations) to be developed or revised in order to precise the particular requirements and to enable implementation. More specifically, the proposed legislative changes should strengthen the following components:

11.1 Assessment of Exposure, Vulnerabilities, Capacities, and Risks

Current legislation requests the vulnerability assessment to be done at the risk analysis stage, as part of the preparation of the Risk Management Plans. General responsibility for conducting vulnerability assessment is assigned to all *"bodies of Unified System of Emergency Situation Management"*, those who are obliged to prepare risk management plans. The guidance on performing disaster vulnerability assessment is included in the Governmental Ordinances on emergency risk management plans[91] and emergency management plans[92]. However, the detailed methodology on the assessment of the vulnerability of exposed people, services and critical infrastructure to different hazards is not provided. There is a need to revise the existing framework by:

- Introducing specific requirements on vulnerability assessment, including distribution of responsibilities, linkages to the other crosscutting legal instruments. These requirements should serve as legal bases for the subsequent secondary legislation (technical regulations), where details, standards, methodologies for such assessment will be defined.
- The vulnerability assessment should become mandatory on different levels and for different hazards. With this purpose, the respective legal requirements should be introduced to the legislation regulating public safety, as well as to the other legislative acts (e.g., spatial, and urban planning, construction permitting, regional development, agricultural development, planning and design of infrastructure and riverbank protective works, infrastructural projects with "high technical risk").
- The standard methodologies of vulnerability assessment should be approved for specific hazards and also be linked to the specific legal requirements that would ensure their obligatory use.

91 The Ordinance of the Government of Georgia on preparing procedures for developing the emergency risk management plan, №453, 2017 available at: https://matsne.gov.ge/ka/document/view/3824640?publication=0

92 The Ordinance of the Government of Georgia on preparing procedures for developing the emergency management plan, №452, 2017 available at: https://matsne.gov.ge/ka/document/view/3824640?publication=0

- The Governmental Ordinances on emergency risk management pans and emergency management plans should be enhanced by incorporation of the specific provisions on the assessment of the vulnerability of exposed people, services, and critical infrastructure to different hazards.
- The principal legislation and the implementing technical and methodological secondary regulations should include, among others, the vulnerability mapping for all relevant hazards, as well as of any compounding risks, at local level in both rural and urban areas and coastlines; The evaluation of possible impacts to critical infrastructure and secondary risks associated with these impacts; Survey of the vulnerability factors such as gender, disability, access to infrastructure, economic diversity, societal inequalities and environmental sensitivities; Assessment of vulnerabilities of key economic sectors at different levels (national to local); Integration of historical and indigenous knowledge into risk assessment; Identification and evaluation of the activities that increase or compound risks (e.g. urbanization and land use).
- The existing legislation and cultural norms should be reviewed to identify gaps that may increase vulnerability, and the results of the review should be incorporated to the proposed new legislation on vulnerability assessment.
- The results of the vulnerability assessment should be presented in a way to be comparable for using on different levels and for differentiated purposes. It should also contribute to the centralized general vulnerability database.
- Modelling of the exposure and the vulnerability should become legally required. The proposed legislative changes should make vulnerability modelling part of the vulnerability assessment.
- It is recommended to establish standards and indicators the modelling should be based on.
- The roles and responsibilities of different institutions should be refined during the process of the revising legislation related to the vulnerability assessment legislation.

11.2 Identification of Key Hazards and Related Threats

The legislative framework for the multi-hazard assessment, mapping and modelling is underdeveloped in Georgia. A unified hazard mapping and assessment methodology regulated through a dedicated legal framework is lacking. There is a need for establishing the relevant legislative base and setting national standards.

- It is recommended to incorporate provisions defining responsibilities and delegation of authority for the multi-hazard threat assessment in the existing legislation governing hazard threat assessment (e.g., Law on Public Safety, Law on National Security Policy Planning and Coordination, subordinated legal acts, statutes of NEA, etc..)
- For the major hazards (specific and multi-hazards), it is recommended to develop Risk Assessment Technical Regulations that will cover methodological requirements and standards for hazard identification, assessment, mapping, and modelling, as well as the related risk and socio-economic vulnerability assessment.

- It is also recommended to introduce national standards for geospatial data and maps, including hazard data and maps and to align hazard data and maps with those standards and linking climate-induced hazard data and maps with a common, unique Geospatial Portal.
- The risk assessment methodologies for modelling and mapping of specific hazards, such as floods, avalanches, landslides and mudflows, windstorms and hailstorms have been prepared and submitted to NEA, but not yet officially approved. In order to ensure usage of the mentioned methodologies, it is necessary to reflect the requirement of preparation of the respective maps and models that will be based on the approved methodologies in the proposed primary legislation as well as in Charter of NEA and its specific departments.
- In Georgia, there is no EU-compliant flood assessment and mapping methodology as mandated by the EUAA. The draft law on water resources management, which is currently discussed within the Parliament, foresees the adoption of the following two subsidiary legal acts. (1) Governmental Resolution "on approval of rules of development of the flood risk management plans"; and (2) Governmental Resolution "On Assessment of Water Bodies under Potential Flood Risks. In order to comply with the above requirements, it is recommended to elaborate and approve the EU-compliant flood assessment and mapping methodology that will be linked to the multi-hazard assessment and mapping methodological regulations.

11.3 Consolidation of Risk Information

For the purpose of development of National Spatial Data Infrastructure (NSDI) system based on principles of harmonization and interoperability, it is important to ensure that the hazard and risk data is compatible with other data within the system. Therefore:

- To enable possibility of consolidation and storage of risk information (including geographic information system) and data related to hazards, exposures, vulnerabilities in the central standardized repository, it is mandatory to take into account the aspect of cross-sectorial integration of the information at the stage of collection of the differentiated data. It is necessary to establish national standards for the systematic collection, sharing and assessment of information and data to be stored in the repository. It is recommended to adopt standards for interoperability and metadata, as well as to revise the organizational framework in the area of the data exchange (hazards, meteorology, hydrology, topography, soil characteristics, vegetation, settlements, existing infrastructure, population, and available socio-economic and material resources, as well as disaster risk assessment, vulnerability assessment, etc..)
- It is recommended to develop separate technical regulations for hazard and risk data preparation and sharing, so the data is being produced using the legally established harmonized standards and methodologies.
- The elaborated technical regulations should make use of the respective methodological documents, prepared by the UNDP Programme on Reducing the Risk of Climate-driven Disasters.
- Also, in order to create enabling institutional environment for the implementation of such regulations,

relevant changes should be made to the statutes of responsible entities (NEA, EMS, other entities who are obliged to collect data).

- The sharing of the data across designated institutions should be supported by the introduction of appropriate data sharing protocols.
- It is advised to introduce legal definition of "critical infrastructure" to the Law on Public Safety and draft the secondary legislation (ordinance of the Government of Georgia determining "the list of facilities of vital importance and the emergency prevention and response requirements on the facilities") respective to the new definition. It would be useful to consider and examine the definition that is included on the EU Directive 2008/114/EC on critical infrastructure.
- In terms of infrastructure that can be impacted by a hazard, the existing legislation should be reviewed in order to ensure that hazards risk is considered in the planning, use and maintenance of CI. For example, risk and vulnerability model, being developed by the UNDP project, is aligned with the EU categories of CI and the prescribed approaches to calculating risk, damages, and losses to those categories of infrastructure, from hazards.
- It is also recommended to ensure compatibility of the criteria provided for the identification of the "potentially dangerous facilities" for the Municipality Safety Passport, with the definition of "critical infrastructure".

11.4 Integration of MHDRIS into NSDI

In order to support integration of disaster risk-related information and databases into the National Spatial Data Infrastructure (NSDI) of Georgia, UNDP is assisting Government with the development of the Centralized Multi-Hazard Disaster Risk Information System (MHDRIS). The recommendations for the establishment and effective functioning of MHDRIS include:

- To draft and adopt necessary amendments in the Law of Georgia on Public Safety (Article 40) in terms of granting EMS a clear power to request the germane information from private legal entities (carrying out entrepreneurial activities).
- To include an exhaustive list of the stakeholders (public authorities (administrative bodies), bodies of the Autonomous Republics and municipalities, as well as legal entities), which will have the obligation to provide the requested data to EMS in the Ordinance of the Government of Georgia on "the Approval of the Procedure for Registering an Incident/Expected or Occurring Emergency Situation and its Effects and for Processing the Data" (which is not adopted yet and is proposed to be issued until 1 January 2022).
- To determine the type of information that will be demanded/requested from different stakeholders (for example, National Agency of Public Registry - cadastral, administrative, environmental, infrastructural, business, orthophoto data) and include it to the same Ordinance.
- To ensure that the MHDRIS is updated systematically and to include fixed deadlines for stakeholders to send the requested/demanded information (for example, draft that they (or individually differently) "are obliged to send an information no later than ....") in the same Ordinance.

- To ensure that EMS is granted the relevant permission from the State Security Service of Georgia to have the access to state secret and handle the challenge, when the requested/demanded information contains state secret.
- To ensure that EMS, as a critical information system subject, performs the obligations undertaken by the Law on Georgia on Information Security (namely, adopt internal rules for information security that meet the minimum requirements for information security (based on the criticality classification of the critical information system subject) that are defined by the Digital Governance Agency in accordance with the standards and requirements laid down by the International Organisation for Standardisation (ISO) and the Information Systems Audit and Control Association (ISACA), determine the person(s) or the employee(s) (Information Security Manager) responsible for observing the information security requirements, etc.).
- To ensure that the establishment and functioning of MHDRIS, as well as the key role of EMS in this process is reflected in the updated Georgia's National Disaster Risk Reduction Strategy.

11.5 Incorporation of Risk Information-related Requirements into the Existing Legislation

In order to safeguard hazard and risk assessment to be performed based on the approved regulations and standards, special legal requirements need to the established. A proper reflection of disaster risk reduction elements, including prevention, mandatory identification of risks in the sectorial development plans need to be improved and enforcement mechanisms refined. More specifically:

- The legislative framework governing spatial and land use planning in Georgia needs to be revised in order to clearly define requirements for incorporation of hazard identification and related risk and vulnerability assessment. The Spatial Planning, Architectural and Construction Code of Georgia should include provisions, requiring combination of the information on hazards (NEA's responsibility) with the information on Risk (EMS' responsibility) and using it as an input to the development of spatial, urban, and other plans. Based on this information (provided in the form of data, maps, and models) certain restrictions of use in the identified high-risk areas should be established and protection from hazards already within the planning process ensured.
- It is recommended that the hazard risk-zoning maps should be used as indicatory maps, based on which, for a specific activity in a certain zone additional research and assessments would be required based on the local and other specifications. This should ensure protection from hazards already within the planning process.
- The respective changes should be introduced to the statutes of NEA and EMS in order to facilitate cooperation and involvement in the spatial and land use planning.
- Governmental Resolution Nr. 260 "on approval rules of preparation of spatial and urban development plans", that represents guiding document for development and approval of spatial and land use plans, should be updated. As the Resolution requests the preliminary research to be conducted and specifies its content and structure, it should include the definitive list of hazards to be taken into consideration.

Annex IV of the Resolution should be enriched with details on hazards, risks, and vulnerability assessment, including maps and models. The detailed information on the specifics of hazard risk maps/ risk assessment plans and on the baseline data the maps/plans to be founded, should be included. The provision of mentioned data should be obligatory, and not "recommended" as it is now. The responsibilities of involved stakeholders should be defined, and respective mandates granted.

- The legal requirement of updating/revising the risk assessment plans and hazard maps should be aligned with the periodicity of assessment and mapping of each type of hazards, and linkages should be provided to the proposed standard methodologies for mapping of each hazard.
- It would be advisable to define the procedure of reviewing draft spatial and land use plans from the point of identification of natural hazards and assessment of risks. The responsibilities of relevant institutions should be specified accordingly.
- The procedure of reviewing the draft spatial and land use plans should be also connected to the strategic environmental assessment (SEA). The Expert Commission, established by MEPA should include relevant experts, to be able to ensure that hazard and disaster risk assessment considerations are well represented within the plans. For this purpose, the development and approval of guiding manual/ checklist might be an option.
- In order to ensure preparation and disclosure of the non-classified, adapted version of the natural disaster chapters of the Threat Assessment Document, it is recommended to incorporate such requirement in the Law on National Security Policy Planning and Coordination and make the link to the statute of EMS that already includes such responsibility.
- In order to create enabling environment for institutions to develop risk management plans, the creation of the help desk, probably under the EMS might be relevant. The help desk will provide assistance with the provision of the baseline information and act as a depository for the existing Emergency Management Plans. With this purpose, it is recommended to revise the Statute of EMS accordingly and to equip the public safety division of the EMS, that is responsible for organizing and supervising the preparation of the Emergency Management and Emergency Risk Management plans, with the respective power and capacity.
- The procedure of continuous review and update of the Emergency Management Plans should be established. The responsibilities of state institutions, beside the EMS for reviewing the plans should be defined.
- In order to Incorporate risk information-related requirements into the existing legislation, it is recommended to identify relevant normative acts from the legislation covering the following sectors: spatial and urban planning, construction permitting, regional development, agricultural development, planning and design of infrastructure and riverbank protective works, infrastructural projects with "high technical risk", and to revise them accordingly.