PERFORMANCE AUDIT REPORT

"APPROVED BY:"

Head of Defense, Public Order and Security Audit Department

Sophio Dvalishvili

25 დეკემბერი 2020

N 19/36

Copy: N 2

Performance Audit of Management (Prevention, Preparedness) of Flood Emergency

Table of Content

TERMS AND ABBREVIATIONS

MoIA – Ministry of Internal Affairs;

LEPL – legal entity of public law;

Emergency Management Service or Service – Subordinated State Entity of Ministry of Internal Affairs – Emergency Management Service;

Ministry of Environment Protection – Ministry of Environment Protection and Agriculture of Georgia;

Environment Agency – LEPL – National Environment Agency existing in the system of the Ministry of Environment Protection and Agriculture;

Ministry of Infrastructure – Ministry of Regional Development and Infrastructure of Georgia;

Roads Department – Subordinated State Entity of Ministry of Regional Development and Infrastructure – Roads Department of Georgia.

Ministry of Education – Ministry of Education, Science, Culture and Sports of Georgia;

Civil Protection – ensuring protection of the human lives/health, environment and property and ensuring normal functioning of the state establishments due to emergency situations as a result of the complex measures exercised by the organizations defined by the law on civil security, state, autonomous republics and municipality bodies in the territory of the country.

Public Safety – ensuring the protection of human life/health, environment, and property from an emergency situation and the proper functioning of state institutes as a result of complex measures carried out in the territory of a country by state bodies, bodies of the Autonomous Republics and municipalities, as well as by the organizations provided for by this Law

Prevention of the Emergency Situation – integrity of measures exercised for the purpose to identify and estimate the emergency situations risks for humans, environment and property protection and/or for reducing (mitigating) or preventing associated negative impacts.

Preparedness – ability of the subjects of the National Public Safety System and the citizens of Georgia to respond effectively to emergency situations, reduce vulnerability and the results of emergency situations;

Flood – critical raise of the river level as a result of opulent precipitation and fast melting of snow and overflow from the riverbed, causing significant flooding of the entire adjacent area or its particular sections.

Flash flood – temporary flow of high volume of water, which is originated instantly at mountain riverbeds and lowlands and flows with high velocity.

1. INTRODUCTION

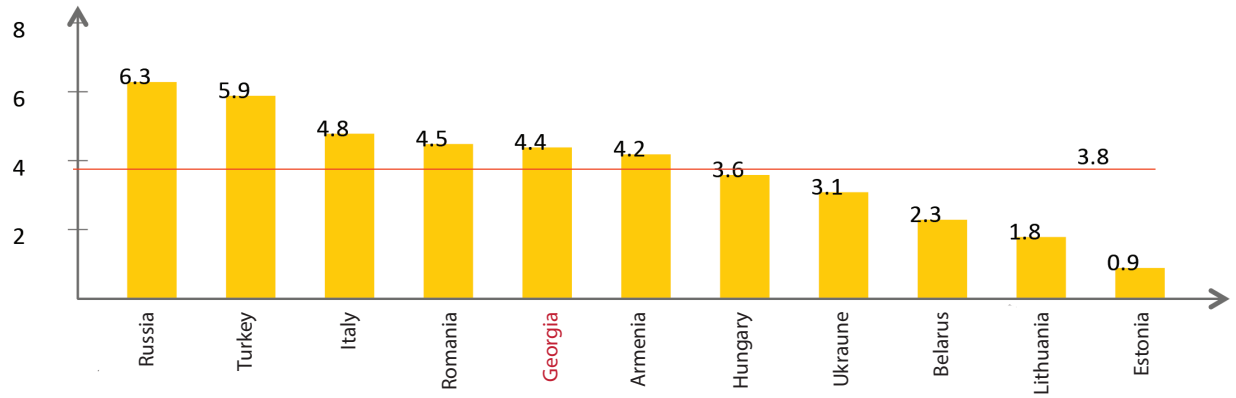
1.1. AUDIT MOTIVATION

Uncontrolled anthropogenic impact on the environment contributed to activation of hazardous and irreversible processes which accelerated world climate changes, in particular the global warming process. Consequently, the temperature on earth is increasing, average annual precipitation trend is changing, sea levels are significantly raising and etc. These are causing frequent occurrence of the natural disasters.

On September 25, 2015, 193 UN member countries agreed the agenda for sustainable development[1], which encompasses 17 goals and 169 targets. (SDG[2]) 13th goal "Take urgent action to combat climate change and its impacts" have been defined and the disaster risk reduction has become one of the topical issues of the world's commonwealth. To respond to the existing challenges, international strategy on risk reduction has been developed and the disaster risk reduction office of UN has been established (UNISDR).

Furthermore, with cooperation of world's authoritative international organizations (UNDP, World Health Organization, UNICEF etc.) global risk management index has been developed, (INFORM)[3], according to which the risk of **natural disaster in Georgia is higher than average**:

Diagram 1. Index of natural hazards risk in various countries



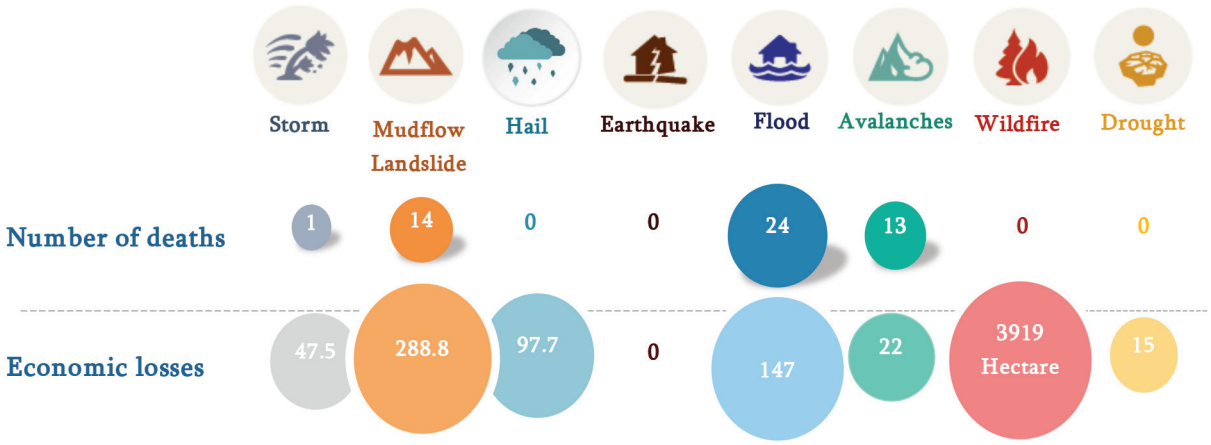
Georgia, due to its landscape and climatic conditions, is vulnerable to various natural hazards (see diagram 2):

1 title – "transforming of our world: The 2030 agenda for sustainable development"

2 Sustainable Development Goals

3 index of natural hazards are calculated with one of the components of the INFORM, which includes the possibility of occurrence of the catastrophes and physical impact on humans, impact on the infrastructural objects and other factors: http://www.inform-index.org/

Diagram 2: Information on economic and human loss caused by natural disaster in **million GEL** (2014-2017 years)[4]



It is noteworthy that the association agreement between Georgia- EU envisages cooperation on prevention, preparedness and response to the natural catastrophes[5].

According to the social-economic development strategy- "Georgia 2020", economic policy of the government of Georgia relies on three key principles, one of which is rational use of the natural resources in the process of economic development, ensuring ecological safety and sustainability and prevention of the natural cataclysm risks.

In Georgia, density of the hydrographic network is observed (there are about 26 000 rivers and ravines in Georgia), frequency of floods and recurrence is once in 5-6 years[6]. Thus, relative share of floods is significantly high and **comprises 24% of the entire material damage** caused by the all natural disasters.

In the process of managing natural catastrophes, the amount invested in the reduction of the catastrophe risks is most cost effective [7] as well ensured **mitigation and prevention measures** can significantly reduce the negative impacts caused by the natural disasters. Furthermore, preparedness for the emergency situations is important in organizing the management of the emergency. Accordingly, at this stage, the audit has studied activities of prevention and preparedness.

In addition to the above stated, on the background of the natural disasters occurred for the past 3 years in the country[8] the public interest is high as to what leverages does the state possess to prevent similar occurrences and mitigate consequences of disasters.

4 the indicated information was provided by LEPL National Environment Agency of the Ministry of Environment Protection and Agriculture of Georgia

5 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, chapter 22, article 376-379

6 http://meteo.gov.ge/index.php?pg=sts&id=16

7 UNISDR and Centre for Research on the Epidemiology of Disasters CRED – Economic Losses, Poverty and Disasters 1998-2017

8 Tbilisi flood of June 13-14 2015, floods in Mestia, Kutaisi, Guria, Kakheti etc.

1.2 AUDIT PURPOSE AND MAIN QUESTIONS

The purpose of the audit is to assess the capability of the preventive and preparedness measures planned and implemented to meet the set targets aimed at reduction of the flood risks, to study shortcomings exiting in the system and issue improvement oriented recommendations which will help the auditees to guide their activities effectively.

Accordingly, **the key question of the audit is the following**:

To what extent are planned and implemented procedures for flood risk prevention and preparedness effective?

In order to respond to the key question, the following sub-questions have been developed:

- To what extent are sufficient and efficient planned and implemented procedures for flood risk prevention?
- To what extent do preparedness activities provide timely response to the expected floods and mitigate its negative effects?

1.3 AUDIT SCOPE AND METHODOLOGY

Scope of the Audit of Efficiency of Management (Prevention, Preparedness) the Emergency Situations Caused by Floods covers period from January 1, 2017 through October 1, 2019, however for the purpose to analyze the trend, information from the previous and current period has been used.

Scope of the audit includes two phases of flood management: *prevention and preparedness.*

The auditees are as follow:

- Subordinated State Entity of Ministry of Internal Affairs – Emergency Management Service;
- Ministry of Environment Protection and Agriculture of Georgia and LEPL – National Environment Agency subordinated to the Ministry;
- Ministry of Regional Development and Infrastructure of Georgia and its Subordinated State Entity – Roads Department of Georgia;
- National Security Council;

Municipalities play significant role in managing catastrophes of the local origin. Information has been obtained from 20 municipalities selected by the audit, in particular: Tbilisi, Kutaisi, Ambrolauri, Akhmeta, Borjomi, Gori, Dusheti, Zugdidi, Telavi, Lanchkhuti, Marneuli, Martvili, Samtredia, Poti, Kobuleti, Kvareli, Tsageri, Tskaltubo, Khashuri, Mestia.

The following methodology has been used to answer the audit questions:

- Analysis of the legal base and regulations;
- Acknowledging international practices and standards;

- Analysis of the existing conditions of the implemented and planned prevention and preparedness events/actions;
- Analysis of the documentary information;
- Interviews with auditees (respective accountable persons);
- Analysis of the data and statistical information;
- Interviews with NGOs and international organizations;
  - Caucasus Environmental NGO Network (CENN);
  - Association Rural Development for Future Georgia (RDFG);
- Survey of population residing at the areas vulnerable to the floods;
- Survey/Interviewing municipalities.

The following audit procedures have been implemented to answer the audit questions:

1. **To what extent are sufficient and efficient planned and implemented procedures for flood risk prevention?** – The audit team has studied legal regulatory base, 2017-2020 risk reduction strategy and the action plans. Accountable persons were interviewed. On the basis of obtained information, the number of elements occurrence per years, physical impact on humans and economic damage extent have been analyzed. For the purpose to study the existing practice of the emergency situation management at the local level, the audit team has selected 20 municipalities and studied the situation on the ground based on the responses to the specially developed questionnaires. Activities implemented by the Emergency Management Service, National Security Council, Ministry of Environment Protection, Roads Department of the Ministry of Infrastructure aimed at flood prevention has been analyzed.

2. **To what extent do preparedness activities provide timely response to the expected floods and mitigate its negative effects? –** To answer this question, the audit team has studied the extent of preparedness of reacting forces and mobilization of the needed material resources for responding to the incident/emergency situation. Implemented projects aimed at raising the public awareness have been analyzed. In this sense, the population has been surveyed at Vere Gorge (Tbilisi), as this district is highly vulnerable to floods. 60 local residents were interviewed, among them 20 pupils and 40 citizens of various age group.

1.4 ASSESSMENT CRITERIA

In the course of the audit, the legislative acts regulating auditees activities were used as the assessment criteria. Also, local and international level documents defining key trends of the disaster risk reduction policy were used as the criteria of the audit. Namely:

- Law of Georgia on Public Safety;
- National Disaster Risk Reduction Strategy of Georgia 2017-2020 and its action plan;
- National Plan of Civil Protection/Public Safety;
- Law of Georgia on Planning and Coordination of the National Security Policy;
- Resolution of the GoG N 452 on Rules on Emergency Management Plan Development;
- Resolution of the GoG N 453 on Emergency Situation Risk Management Plan Development Rules;
- Law of Georgia on Structure, Authority and Activity Regulations of GoG;

- 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.

International organizations and professional unions develop methodologies and standards aimed at management of Disaster Risk Reduction (DRR):

- UNDP methodologies;
- SENDAI Framework for Disaster Risk Reduction (SFDRR).

Various country practices and experts' opinions are outlined in the indicated methodologies and strategies.

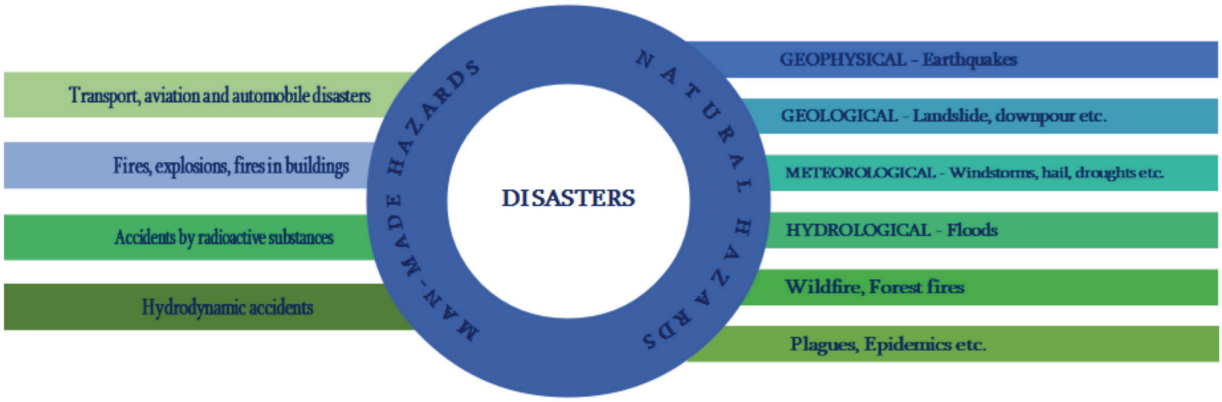
For the purpose to assess the effectiveness of the national system of the civil security, so called "common sense" and the international practice have been used as the criteria.

2. GENERAL INFORMATION

2.1 OVERVIEW OF THE SPHERE OF AUDIT

The existing legislation[9] defines hazards caused by the natural and anthropogenic factors according to their types (see diagram N3):

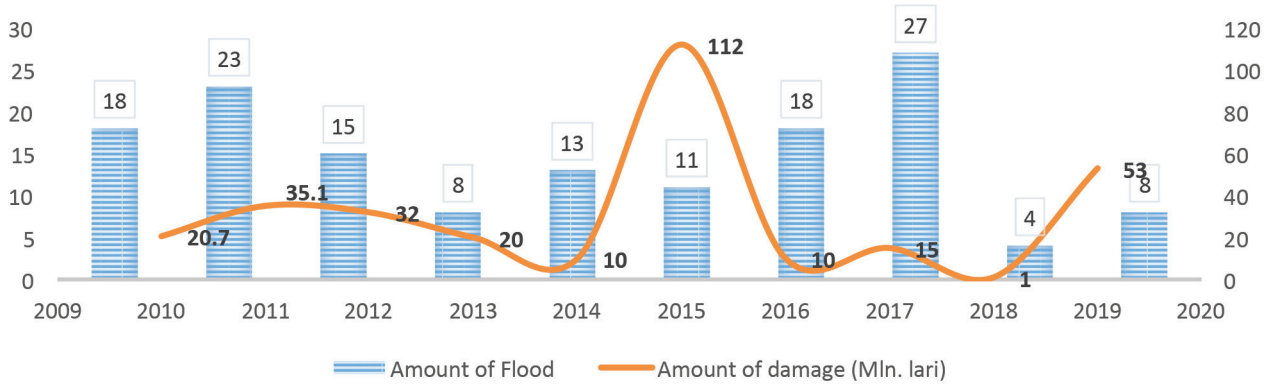
Diagram 3. Types of Hazards



*The audit included that part of the national security which primarily deals with floods, flash flood, high waters (*hereafter all these disasters referred to as "**floods**").

Due to recent frequent floods, the damage incurred by them increases. The diagram below shows economic damage in million GEL caused by the floods during 2010-2017, where the significant 2015 year deviation is attributed to the large scale flood at Vere Gorge.

Diagram N4. Floods during 2010-2017 and incurred economic damage (number of disaster, amount of damage)



9 Resolution of GoG as of March 21, 2008 N 68- on" Rule of Determining Emergency Situation Classification".

EMERGENCY SITUATION MANAGEMENT PHASES

Flood, as well as other natural hazards, is one of the types of the emergency situation, accordingly general principles of managing the emergency situations apply thereto. Continued process of managing the emergency situation is composed of 4 key phases (see diagram 6).

Diagram 5. Emergency Situation Management Phases

According to the law on civil Protection, the preventive measures include:

- The measures of determining probability of origin of the emergency situation, its monitoring and prevention;

- The measures adopted for systematic reduction of the detrimental potential of hazardous natural phenomena and processes and respective engineering-technical solutions;
- Preparing a map of the emergency situation risk;
- The preparation of safety passport of potentially hazardous facilities and for municipalities;
- implementing educational projects for raising awareness of people.

Preparedness measures include:

- organizing issuance of prior notice to the population on state of emergency (early warning system);
- educating various social groups of population and informing population on civil protection issues;
- training and equipping professional rescuers;
- civil safety exercises;
- creation of material reserves for the purpose to liquidate the consequences of the emergency situations.

2.2 NATIONAL SYSTEM OF CIVIL PROTECTION

The law[10] **defines the national system of civil protection** as the unified network of the national system entities [11] which, at the strategic, operational and tactical levels, using the relevant resources and instruments, exercises relevant complex measures to protect human lives and health, environment and/or property from the state of emergency[12]".

National system entities, other than organizations[13] and municipality bodies, within their spheres of jurisdiction, are committed to ensure[14]:

- Emergency risks management – identification of hazard, analysis of the emergency risk and their impact and on its basis development of the state of emergency risk management plan;
- Planning and implementing measures for prevention of the state of emergency, among them risk of the state of emergency;
- Preparedness for the state of emergency;
- Responsiveness to the incidents/state of emergency;
- Protection of humans, environment and property from the incident/state of emergency;
- Develop a warning system for the incident/state of emergency, among them early warning system;
- Development of the emergency management plan etc.

As for the municipality bodies, they exercise such power on the basis of delegation, on which the GoG makes decision, and an agreement on the delegation of the said powers shall be concluded by the Ministry of Internal Affairs.

According to its results, response forces needed for liquidation, nature, location and scope, the state of emergency can be of **local or national significance**. [15]

In the process of **execution of floods prevention and preparedness measures,** several establishments have significant role, to whom the legislation grants respective powers.

10 Law of Georgia on public safety

11 Uniform network of the executive power establishments, LEPLs and state sub-agencies, AR authorities, municipality bodies and the state power of attorney.

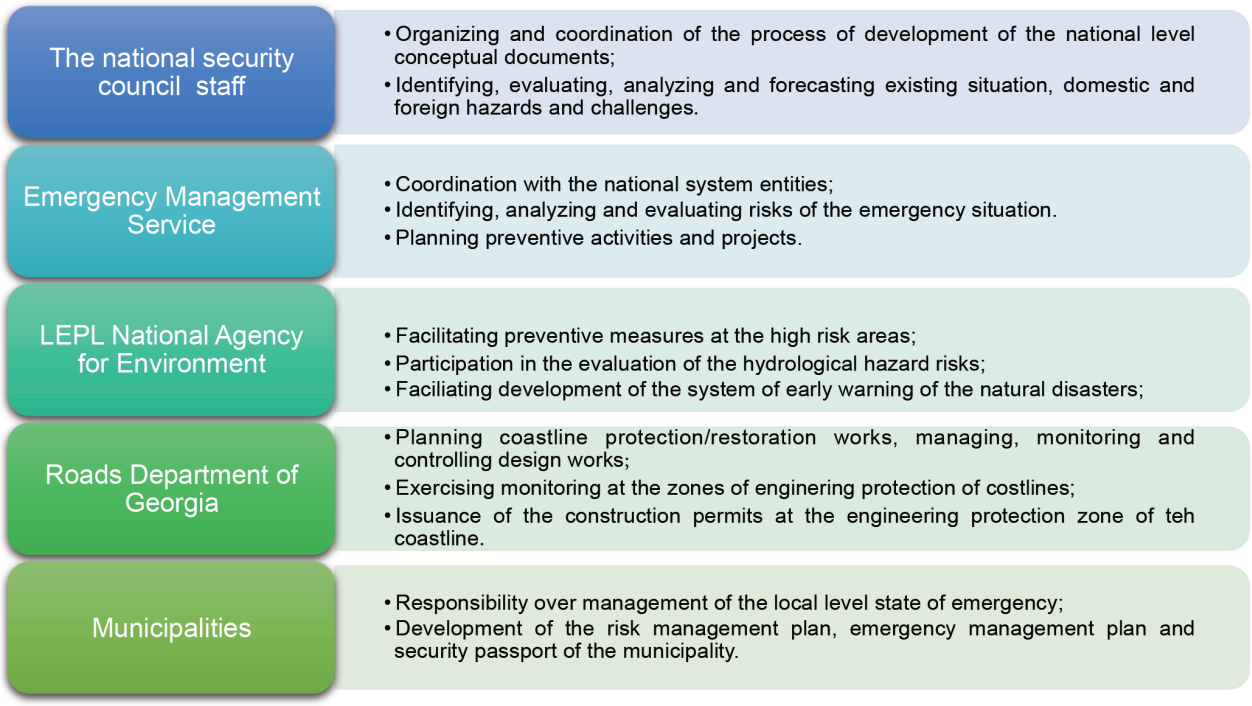
12 Law on public safety of Georgia, article 4, clause 1

13 Educational, pre-school or medical establishment, industrial enterprise, also legal entity of private law, activities of which may generate the hazard of occurrence of the emergency situation

14 Law on public safety of Georgia, article 5, clause 1

15 Local significance – if various responding forces located at the territory of one entity or several adjacent municipalities are sufficient for its management. National significance – when the forces and means indicated above are insufficient for its management and when its impact may spread at the entire territory of Georgia, create hazard to human lives and/or health, national treasury and other important tangible assets etc. also its localization/liquidation extends over time and requires international assistance.

Diagram 6. Functions of the establishments engaged in floods prevention and preparedness measures planning-execution:



According to the law on civil security [16] the Emergency Management Service is the entity guiding the security system in the peaceful period[17] which coordinates planning and execution of the policy in the sphere of civil protection.

Emergency Management Service was subordinated to the Ministry of Internal Affairs in 2017. In 2018, it was subordinated to the prime minister. Since 2019, the Emergency Management Service represents the sub-agency of the Ministry of Internal Affairs, which is also accountable to the prime minister.

2.3 INTERNATIONAL EXPERIENCE

RISK MANAGEMENT MODEL

Based on multi-year international experience, it is acknowledged that every dollar invested in preparing for natural disasters today can save 7 dollars in recovery costs[18]. Thus, to achieve the cost-effectiveness in the process of management of the natural disasters[19] it is important to implement preventive measures in a timely and targeted manner.

16 law on public safety, article 4, clause 3

17 during the state of war the emergency situation is managed consistent with the national defense plan (the document is classified), article 18, clause 1 of the same law

18 Aktion Deutschland Hilft, Germany's Relif Coalition – Cost-Benefit analisis of Disaster Risk Reduction

19 UNISDR and Centre for Research on the Epidemiology of Disasters CRED – Economic Losses, Poverty and Disasters 1998-2017

Correspondingly, approaches to the elements in the modern world have changed and the EU member countries have switched from **the crisis management model** to the **risk management model,** which implies prioritization of the measures to be exercised for reduction and prevention of the risks of catastrophes, versus response-recovery measures.

Therefore, special significance is given to planning-exercising of such measures [20] which will significantly minimize the negative impact of flooding.

FLOOD FORECASTING AND WARNING SYSTEM

One of prerequisites of effective management of the risks of floods is systematic observation of glaciers, river basins and other areas, which until now has been basically achieved by site visits of the specialists. Accordingly, this required significant human or financial resources.

Currently, developed countries using artificial satellites of earth control processes developing in the environment which is a expensive service. In line with this, drones are intensively used which provide high resolution images in real time, it is used for creation of the hazard maps and the risk model.

Providing people located in the zone of disaster with the flood forecast in a timely manner is one of the important challenges. In many countries[21] warnings are delivered (information includes hydrological warning and weather forecasts) through SMS, web-pages and social networks.

NEGATIVE ROLE OF URBANIZATION IN FLOOD PREVENTION

Progressing urbanization (accumulation of industry and population in the cities) also contributes to growing impact of the natural disasters on humans in the world. In the developing countries, disregarding respective regulations and planning, urbanization is expanding and consequently settlements are often established at the hazardous locations without assessing existing risks and undertaking preventive measures.

At the densely populated cities, due to the lack of the sufficient territory, often the residential buildings are constructed at the high risk containing locations (for example, river flood-plains or locations prone to landslides), where no settlements were observed historically. This process is exasperated by ineffectiveness of regulations and low level of awareness.

Developed countries pay special attention to regulation of the urbanization process. For example, Civil Responsibility Agency/National Council of Sweden ensures development of the legislative base in the flood management sphere, is responsible for drawing up flood maps etc., as for the issues of construction at the coastline zones, those are resolved by the municipalities, however

20 establishing and measuring the risk of catastrophe; timely notification of the population on anticipated natural disasters and their possible results; prior preparation of the residential and working environment to minimize anticipated damage; raising awareness among population how to protect human lives and property in case of floods etc.

21 USA, Holland, Italy, Greece

in case of breach of construction standards in such zones municipality may be deprived of such right, which represents important leverage for prevention of the illegal and risky constructions.

POSITIVE ROLE OF FORESTS IN FLOOD PREVENTION

Forest is one of the important components in the catchment areas. At the watersheds covered with dense forests retention of surface water created from atmospheric sediments lasts longer. The surface of such catchment area evaporates water in higher volumes, prolongs snow melting process, and the soil under the forests is distinguished by good capability of water absorption and significant volume of water is drained through. Due to this reason, water flows created after strong and extensive rains or after fast melting of snow, take longer to exit the dense forest covered catchment area as compared to the catchment area lacking the forest cover, thus reducing the flood risks.

Accordingly, maintaining/restoring forest and prohibiting tree cuts in the risky zones is the strategic priority of developed countries.

According to the "Bonn Challenge", developed by the United Nations in 2011, 75 countries around the world will restore degraded and deforested forests and will cover approximately 150 million hectares by 2020, and 350 million hectares by 2030, which, along with many other positive effects, is considered as an important factor for the flood prevention.

AUDIT FINDINGS

3. PREVENTIVE MEASURES

3.1 SHORTCOMINGS OF THE STRATEGIC PLANNING

On January 11, 2017, under the resolution of the GoG, for the first time in the country, national strategy[22] and its action plan[23] have been approved, which determined key priorities of the risk reduction policy and the mechanisms of implementation of the national strategy. The purpose of the indicated document is establishment of uniform, flexible and efficient system, which by means of joint and coordinated efforts of the entities determined by the law, shall ensure reduction of the risk of catastrophes caused by natural and human factors in the country.

Development-approval of the strategy document and the action plan is positive fact, however it has certain shortcomings, in particular:

- The strategy provides the general evaluation of flood hazards and is noted that the following are distinguished by especially high risks: Imereti, Samegrelo, Guria, Mtskheta-Mtianeti catchment basins, however there is no particular indication of the risk bearing rivers. Mtkvari and Alazani are listed as risky rivers, however, similarly, there is no reference to the information on particular sections or risks.
- Strategy does not define the issue of reforestation as the form of flood prevention measures and the regulation of the urbanization process of coastal zones, while developed countries pay special attention to this issue.

SHORTCOMINGS OF THE ACTION PLAN

Action plan includes 25 priority spheres (all related to the elements) and 184 exercised measures, out of which 32 – are envisaged for flood prevention purposes. However, some of the trends defined by the strategy are not considered in the plan. For the rivers – Mtkvari and Alazani, there are no preventive measures considered, while these rivers are indicated in the strategy as the highly hazardous.

As a result of the audit it was revealed that there is a significant lagging in terms of performing the plan.

In the process of audit, the results of monitoring of performance of the action plan by the emergency management service after the end of 2018 has been obtained, however in 2019 such type of monitoring has not been done.

Out of 32 measures envisaged by the action plan, by the end of 2018 (i.e. for the monitoring period) 16 measures were projected to be finished (50% of the planned), out of which only 5 projects have been accomplished.

22 Hereafter –strategy or risk reduction strategy

23 Hereafter- action plan of the strategy

Based on the foregoing, the state of performance of the flood preventive measures is not satisfactory, which is attributed to the uncoordinated efforts of the system entities, shortcomings in the project management, problems with funding and insufficient monitoring of the project implementation.

3.2 ABSENCE OF THE UNIFORM INFORMATION BASE AND LOSS CALCULATION METHODOLOGY

There is no **uniform information base** in the country, which would accumulate complete data on natural catastrophes (according to their types, extent of damage, liquidation expenses etc.), analysis of which would facilitate decision makers in the future to allocate budget resources optimally, responding to the actual needs.

According to the law [24] the emergency management service is tasked to create and maintain uniform information bank, however, the indicated base has not been so far established. Respective entities differently record statistical information on floods and flash floods.

The reason of difference of the information is the shortcomings observed in terms of communication and information exchange, as well as lack of uniform methodology, which would provide classification status of particular cases according to the detailed criteria.

For the purpose to analyze the situation and plan further respective preventive measures, in line with the uniform information base, it is necessary to have **loss accounting methodology** in place, which would allow to record financial and material loss caused by the natural disaster using uniform method.

The audit revealed that **there is no methodology for accounting loss incurred by the natural disaster in place,** due to which the municipalities are calculating results differently, what ultimately hinders efficient planning of the preventive measures and may incur inefficient spending of the budget resources after the catastrophe occurs (in the part of reimbursement of loss by the state).

3.3. DEFICIENCIES IN FINANCING THE DISASTER RISK REDUCTION

In the process of audit, information provided by 20 municipalities selected through the audit judgement was studied regarding the extent of damage incurred by the floods in 2017-2019, expenses rendered for restoring objects damaged as a result of natural disaster and expenses needed for funding preventive measures (see diagram N9):

24 Law of Georgia on public safety, Article 20, Clause 1.

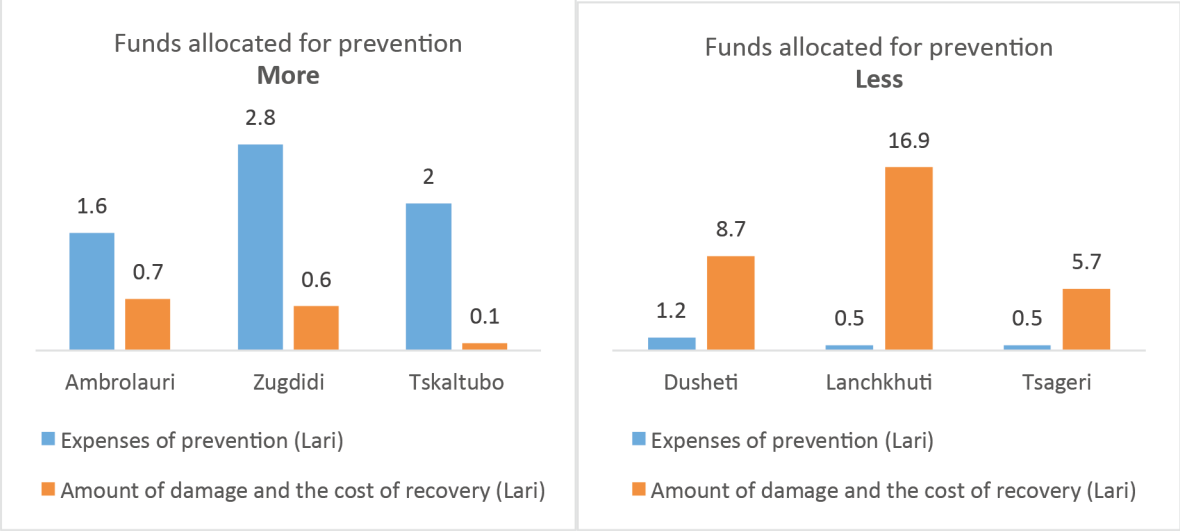
Diagram 9. Damage caused by floods in 20 municipalities of the country, also costs of restorative and preventive works (2017-2019)

Expenses of recover events	• 8,597,116 GEL
Expenses of prevention events	• 18,981,699 GEL
Amount of damages	• 35,062,629 GEL

As seen from the diagram, extent of loss caused by floods significantly exceeds the resources spent for flood prevention.

Due to lack of methodology, it is possible that scope of loss may be inaccurate, however the general analysis shows that municipalities which spent more resources for preventive measures, are distinguished by lower expenses according to the extent of damage and the restorative works, which is a positive fact. Where no preventive measures have been exercised, the extent of loss is higher (see diagram N 10).

Diagram 10. Correlation between the resources allocated for the preventive measures and extent of loss according to the municipalities



The above indicated general policy shows how important is to manage more resources for preventive measures.

Practice of the other countries[25] shows that for management of the natural disaster, as well as efficient implementation of the other programs, program budgeting is the important tool.

Main advantage of the program budget is that first the program's achievable result and indica-

25 Australia, Philippines

tors are planned by means of which results are measured, afterwards costs necessary for achieving the result and the program implementing entities are calculated and defined[26].

According to the existing situation, neither flood nor other natural disaster risk reduction budget program is individually registered, and measures are scattered among the establishments. Various establishments, under their competences, work independently, however it is not possible to discern the general picture of particular preventive activities and funding and casual connections.

Table 11. Budgets defined by strategic plans to reduce flood risk in the country

Organizations	Documents	Number of Activities	Budget (MLN. GEL)
Different entities	The National Strategy for Disaster Risk Reduction 2017-2020	16	10.9
Ministry of Environment and Agriculture	Third National Environmental Action Program (2017-2021)	4	10.0
Ministry of Regional Development and Infrastructure	2018-2021 Regional Development Program	No specific measures defined	82.0

According to the first two documents, the measures are defined and they are related to flood prevention at different locations, however, for only 16 out of 32 measures have envisaged budget- 10.9 million GEL, and for other activities budget is not specified, as basic design and project planning work has not been performed.

A total of 521.0 million GEL has been allocated for the Regional Development Program for 2018-2021, out of which 82.0 million GEL expenditures are planned by the Department of Roads for the implementation of coastal fortification works.

In 2019, the government allocated 16.7 million GEL under the state Disaster Prevention Program to fund municipalities for projects related to flood prevention. These funds will be used to build dams and gabions, to clear the riverbeds, etc., although these funds were not outlined in the action plan.

In addition to the above, the UN Framework Convention on Climate Change (GCF) has approved a 7-year project aimed at developing an early warning system in Georgia to reduce, prevent and prepare for risks related to multilateral climate threats. As part of the project, which has already started, 72 million USD will be spent in Georgia, out of which the Georgian government will be obliged to allocate 38.2 million USD for co-financing the project.

3.4 THE PROBLEM OF FOREST FELLING AND RESTORATION AT THE RIPARIAN ZONES

One of the key components of the water management in the catchment areas is the forest and its reduction raises the possibility of natural disaster occurrence. Felling-devastation of the flood meadow represents significant hazard, taking this circumstance into consideration, according

26 Order N 385 of the GoG dated July 8, 2011

to the forest use rule, forest sections with 300 m width along the river, lake, impoundment and water channels belong to the areas of special functional purpose (hereafter – SFP) meaning that at such territories commercial and social cuts are not allowed [27].

Municipalities carry out activities within their administrative borders and ensure bank protection works, however, reason causing elements may go beyond the municipal borders and be inflicted by the ongoing felling of forests within particular gorges which represent the area managed by the Ministry of Environment Protection.

The audit revealed that in the risk reduction strategic documents, restoration-maintenance of the forests, especially flood meadows as a flood preventive measures is not envisaged. There are frequent cases of felling forests in the river gorges thus increasing the possibility of occurrence of the natural catastrophe. In certain cases, at the small rivers, under the permit terms issued by the Ministry of Environment Protections, trees are cut in the restricted zones, and often, in such zones illegal cuts are observed (cuts without relevant permit). Monitoring undertaken by the Ministry cannot fully reveal and respond to such facts.

The Ministry of Environment Protection has 3 significant leverages to prevent floods:

1. While issuing commercial or social forest cutting licenses/permits, to protect 300 m zone established by the legislation, or update legislation and take into consideration river parameters when establishing SFP zones;

2. For revealing illegal cuts at SFP zones, conduct intensive monitoring and provide due reaction;

3. Envisage long term risks of floods in the criteria on forest restoration.

The audit revealed shortcomings in each direction and potential for improvement, namely:

In some cases, the 300-meter zone provided by law is not protected and forest cutting takes

27 Resolution of GoG N 242 as of August 20, 2010 – on approval of forest cutting rules; Article 9, clause 2, sub clause b. Only sanitary cuts are permitted at the SFP zones.

place. According to the current practice, the protection of the 300-meter zone is carried out only in relation to large rivers, and in the vicinity of small rivers, forest cutting places are allocated. For example, according to one of the forest utilization plans, the above-mentioned restriction applies to the 3 out of 6 rivers, and in other cases there is no restriction on 300 meter zone.

In addition larger problem is illegal logging, which require intensive monitoring implementation plans.

CONCLUSION

A strategy to reduce the risks of floods, as well as the action plan, informational data (on which the planned measures should be based) and the funding system cannot ensure the effectiveness of preventive measures. In particular:

- The risk reduction strategy does not address some significant issues related to flood prevention.
- The action plan is incomplete, and only a small part of the measures planned (16%) has been implemented. A significant portion of the issues covered in the plan are delayed and unfulfilled.
- In 2019, action plan was not monitored.
- There are methodological shortcomings in the registration of statistical information. Different agencies (municipalities, the Ministry of Environment and Agriculture, the Emergency Management Service) record disasters with different classifications.
- The loss calculation methodology has not been developed. Municipalities calculate losses differently. Actual volume of existing losses cannot be determined.

A system and model for financing emergencies and disasters is not clearly focused on prevention and preparedness measures. Funding is agency-based, individual and does not provide an opportunity to see causal links. Therefore, according to the individual budgets, it is impossible to identify the exact measures taken to prevent floods.

Building dams and Gabions are considered to be the main measures for flood prevention. These kind of actions alone will not prevent flooding, as, among other factors, flooding is mainly caused by deforestation, especially in floodplain forests.

The existing regulations on the prohibition of deforestation in riverbeds and valleys are not properly executed. Consequently, deforestation is still taking place in such areas, which may cause flooding and significant damage. Illegal felling of trees in river floodplains is not properly monitored. According to the Ministry of Environment, this is due to insufficient human resources. In addition, relevant normative acts does not take into account the risks of floods and natural disasters as the criteria for the restoration of forests.

ISSUED RECOMMENDATIONS

TO THE NATIONAL SECURITY COUNCIL:

Under their competence, organize and coordinate the following:

- The process of developing and updating the conceptual document of the national level, in particular the Georgian hazard Assessment document, taking into account the threats and challenges caused by the newly identified natural and human factors;
- For the purpose of ensuring efficiency, it is important to update the strategy and its action plan, including all significant flood causing factor response mechanisms and all efforts planned in this direction, responsible entities identified and relevant funding allocated. It is important that action plans had the program budgeting content and ensure the interrelation of goals, actions and funding.
- Consider the possibility of improving and refining the current legislative framework in terms of accurate separation of the functions of the Office of the National Security Council and the Emergency Management Service and monitoring the implementation of measures taken by the National Strategy Action Plan.
- To establish the homogenous approaches and uniform standards, it is important that the national security council and its staff coordinate the following:
  - Development of the statistical information recording methodology and facilitate introduction of the uniform electronic program of registering natural disasters, which will cover all information related to the elements (information databank).
  - For the assessment of the volume of damage, planning the relevant measures needed for the restoration, it is important to develop and introduce loss accounting methodology.

TO THE MINISTRY OF ENVIRONMENT PROTECTION AND AGRICULTURE OF GEORGIA:

- For the purpose to prevent floods, reinforce monitoring of forest felling at the riparian zones;
- For ensuring flood preventive measures, it is important that the strategic documents include measures of restoring forests at the river gorges and special significance should be given to this issue taking into consideration existing risks.
- For the purpose of preventing floods, the Ministry should revise the criteria of acknowledging 300 m forest areas located along the rivers as SFPs and bring into compliance with the river parameters.

4. COORDINATION AND MANAGEMENT OF NATURAL DISASTER

4.1 LACK OF COMMUNICATION BETWEEN THE ESTABLISHMENTS

According Sendai framework program[28] for strengthening disaster risk management it is important to establish **coordinated and organized** structure. Management of the natural disaster risk is complex process as various establishments are involved:

- **Municipalities –** within their territories they should evaluate flood risks, identify vulnerable territories, plan risk reduction and response-restoration measures for the state of emergency. For this purpose, it is necessary to develop risk management plan and emergency situation management plans.
- **National Agency of Environment –** is specialized in the process going on in the environment and can estimate anticipated threats scientifically. Accordingly, all researches held by the Agency and recommendations should be used by the municipalities as well as the automobile roads department to reveal risky (emergency) sections and plan works.
- **Automobile Roads Department –** in the process of monitoring should rely on risks evaluated by the National Agency of Environment and Municipalities, on the basis of which bank protection measures should be planned. Furthermore, the body issuing construction permit within the riparian zone must apply to the Automobile Roads Department for obtaining mandatory conclusion.
- **Emergency Management Service –** is the coordinating entity, which is tasked to ensure communication with all services, exchange information and develop uniform approaches what in the end will ensure efficient functioning of entities engaged in the system towards the general goal – reduction of the risk of disaster.

According to the existing situation, entities engaged in the system operate without mutual agreement and sufficient communication, what does not correspond to the international practice and the approaches determined by Georgian legislation in this respect.

As a result of the audit it was revealed that the communication is insufficient between the coordinating establishment – emergency management service with the other establishments, as well as between the other members of the system (automobile roads department and national agency of environment). In terms of managing the natural disaster, organizational functions of the establishments are not segregated, there is no adopted standard and periodicity of information exchange between the establishments. This is reflected on the lack of efficiency of the implemented measures.

The audit revealed particular facts, when the monitoring implemented by one entity revealed the problem, however due to the lack of respective standard of information exchange, other organizations failed to provide timely feedback.

28 Framework program adopted in the city of Sendai of Japan – "Sendai Framework-Program of Catastrophe Risk Reduction 2015-2030", priority 2, achievement measures

Automobile roads department conducts periodic monitoring as a result of which assigns categories to the particular locations (I, II, III).

The results of the 2016-2018 monitoring are shown on the diagram:

Diagram 12. Monitoring Results by the Roads Department by Categories (2016-2017 Sum)

As can be seen from the diagram, a total of 536 emergency areas were identified, of which various preventive measures were implemented at 56 sites during these years.

Due to limited resources, it is important to take into account the risks identified by all agencies when selecting infrastructural activities for rivers, and then plan activities. According to the Department of Roads, they take into account the letters from the municipality, however, not all agencies working on flood prevention are fully involved in this process (National Environment Agency, Emergency Management Service). Also, the results of the monitoring are not sent to the coordinator – the Emergency Management Service. As a result, there are frequent cases when preventive measures cannot be taken at the monitored emergency areas.

During the audit process, information provided by the National Environment Agency and the Emergency Situations Management Service (data on already occurring floods) was compared with road department monitoring reports (2017-2018) and revealed that in at least 37 cases, flooding occurred in areas not covered by the monitoring report.

In this period, 16 cases with flooding were reveled though monitoring before the element occured, however the department of automobile roads had not planned respective works at 10 locations although they were granted I-st category as a result of monitoring. Correspondingly, floods occurring at these rivers incurred much more damage to the population than it would cause in case costal fortification works had been implemented in a timely manner ***see. example N1.***

EXAMPLE N1
AS A RESULT OF MONITORING OF 2016, RIV. RIONI OF ABASHA RAYON - WAS ASSIGNED TO I -ST CATEGORY.

- **works were not planned**
- **As a result of river overflow, significant damage was incurred to the village of Abasha. For the damage liquidation measures 2.3 million GEL was allocated.**

EXAMPLE N2
AT RIVER NENSKRA, VILLAGE CHUBERI, MONITORING HAS NOT BEEN CARRIED OUT FOR YEARS

- **On July 5, 2018 - major flood occured which damaged houses and infrastructure objects.**
- **The government allocted 530,765 GEL for recovering of this damage.**

Due to the lack of communication, there are also cases when the Roads Department has not monitored the rivers at significant risk assessed by the National Environment Agency and no preventive measures have been planned. The floods caused damage – ***see. Example 2.***

These examples indicate to the lack of preventive measures. Also, with coordinated efforts of the establishments engaged in the disaster risk management, in terms of limited resources, when planning particular measures it is possible to select more priority directions, rather than this is done by single establishment.

4.2 PROBLEMS EXISTING IN THE PROCESS OF LEGISLATIVE BASE FORMATION

Many establishments are engaged in the civil security sphere, for their coordinated work it is important to have regulated legislative base, so that the national system entities know exactly what their tasks are, how and with what resources should they exercise assigned functions.

Significant shortcomings were revealed as a result of audit in this direction, which will ultimately the problem of communication. Namely:

- Documents which were created and approved – are not functioning efficiently;
- Significant normative acts have not been adopted which would facilitate coordination process.

Initiation of these issues and facilitation of processes should be ensured by the emergency management service.

One of the main directions for managing the local importance emergency situations, is to develop risk management and emergency management plans.

Approval of the emergency situations risk management and emergency management rule was the positive event, according to which municipalities[29] before December 31, 2018 had to approve individual plans.

Audit team has selected 20 municipalities analysis of which revealed that only at 5 municipalities[30] have started to work in this direction.

One of the reasons for deficiency developing plans is the lack of qualified employees at the municipalities which is supported by the results of the municipality inquiries. Therefore, facilitation and coordination of the process by the emergency management service is highly important. Control over development of the plans by the emergency management service would significantly improve respective processes at the municipalities.

29 Law on civil security, Article 23, date May 29, 2014

30 Marneuli, Khashuri, Zugdidi, Gori, Tskaltubo

CONCLUSION

The audit revealed that coordination mechanisms are weak. It is not defined what type of information and how frequently should the entities involved in the system exchange with each other.

The audit revealed that many normative acts are not approved and accepted for preventive measures, mainly due to the lack of coordination.

Municipalities, which have become one of the main preventive links in the system, are unable to ensure effective flood prevention. No risk management and emergency management plans have been approved in any of the municipalities, therefore the level of preparedness of the municipalities is low.

ISSUED RECOMMENDATIONS

TO THE EMERGENCY MANAGEMENT SERVICE:

- For the purpose of efficient coordination of the establishments involved in the civil security system and prevention of floods, the EMS should develop the coordination and communication plan with the entities engaged in the system which on the other hand would ensure regulated operation of establishments and providing timely information to all respective entities. To achieve this goal, it is necessary to determine method of communication, frequency and information sharing standard.
- For enforcing preventive measures, the EMS should ensure inventory/prioritizing of the normative and legislative acts to be adopted in the catastrophe management sphere and by applying initiatives expedite the processes in this direction.
    - For ensuring efficient management of the local level emergency situations and guide the process in a timely manner: organize additional trainings and workshops for the municipalities, which would facilitate local self-governments to design efficient plans.
    - To introduce control mechanisms over developing risk management and emergency management plan by the municipalities, which would ensure development of the indicated documents according to the established standards.

TO MINISTRY OF THE REGIONAL DEVELOPMENT AND INFRASTRUCTURE AND THE ROADS DEPARTMENT OF GEORGIA:

For the purpose to periodically plan various efficient infrastructural preventive measures in the scope of the existing budgetary resources (flood prevention activities), the Ministry should ensure the use of the researches, findings and monitoring reports produced by various establishments of the system in the activity planning process.

5. PREPAREDNESS MEASURES

5.1 EARLY WARNING SYSTEM SHORTCOMINGS

Among the flood preparedness measures, early notification systems are of crucial importance, correct planning and development of its network is directly linked to the flood hazards and vulnerability map creation.

As of today, geological-scientific technologies are widely practiced in disaster risk reduction efforts. In the developed countries, GIS –**digital maps** (hereafter GIS maps) digital maps are used. This is the information system, in which all state establishments within their scope of competence depict their relevant information. For example: Department of Geology depicts landslide hazardous zones at respective locations, Hydrology Department – flood zones, Energy Department – strategic location where important power lines are passing etc.

Some progress has been achieved in terms of creating such maps (spatial maps are prepared, where all objects will be reflected) however marking vulnerable locations by the responsible entities on the map has not been done and no works are even planned in this direction.

According to the existing practice of **early notification system**, national environment agency provides information on weather worsening promptly to the emergency management service. Also, sends emails to relevant state establishments, among them 112. The agency posts relevant information at the web-portal, TV and radio. **However, at this stage there is no SMS notification service provided to the population, which is highly efficient and is practiced in developed and developing countries [31].**

5.2 SHORTCOMINGS OF THE PUBLIC AWARENESS MEASURES

On both stages of emergency situation management (prevention, readiness) special importance is given to working with the population for the purpose of informing and raising their awareness as their **life and health protection is the priority of the civil security system.**

According to the manuals of the international organizations,[32] first of all it is necessary to distinguish vulnerable groups of population (children, elderly people, disabled persons, business sector representatives etc.) and use of various instruments adapted to respective groups. Audit revealed that Emergency Management Service has planned certain awareness raising campaign, however there is the potential of significant improvement in this direction. Namely, *development of the relevant strategy* would allow the entity to manage awareness raising measures more effectively.

31 Japan, Australia, Bangladesh

32 Public awareness and public education for disaster risk reduction: a guide – International Federation of Red Cross and Red Crescent Societies

Audit revealed that EMS actively cooperates with the international organizations and NGOs, various products are created – video lessons, mobile application- however they are not popular and fail to reach the ultimate goal. Also, groups vulnerable to floods are not identified and only students represent the target audience. Correspondingly, there are no sufficient information means to reach out population and the public awareness is low in this direction. In particular:

- EMS together with the organization "Save the Children" has created video lessons on reduction of the disaster risk which were posted at the web portal of the company Silknet "domestic school". This video can be seen at the popular web page Youtube, however video-lesson which regards floods – has been seen only for 1013 times[33], meaning that this video is not popular and does not achieve set goal[34].
- Also mobile application has been created where the rules of conduct during each catastrophe are well described. However, this application has not been released yet for all software[35] and is hot used in fact.

CONCLUSION

Emergency preparedness measures are necessary to ensure a timely response to the disaster. The following shortcomings were identified in the prepardness measures:

Modern technologies are not used for early warning notification systems – digital maps (GIS), SMS messages. At the same time, in order to introduce the appropriate forecasting and early messaging system, it is important to expand the forecasting network, which is planned by the Green Climate Fund project. Some steps have been taken to introduce digital maps, but one responsible agency for the project has not been identified and the project is delayed.

The Emergency Management Agency is actively cooperating with international and non-governmental organizations to raise awareness of the population, various products are created – video lessons, mobile applications – however, they are unpopular and do not achieve their ultimate goal. At the same time, vulnerable groups to floods have not been identified and only school students are the target audience.

ISSUED RECOMMENDATIONS

TO THE EMERGENCY MANAGEMENT SERVICE, MINISTRY OF REGIONAL DEVELOPMENT AND INFRASTRUCTURE AND LEPL NATIONAL ENVIRONMENT AGENCY:

- For raising the efficiency of the early notification system, it is important to use modern technologies (SMS notifications);
- The establishments should jointly discuss the measures necessary for creation of the digital

33 As of January 24, 2020

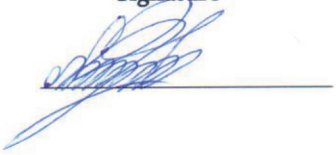
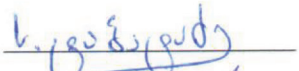
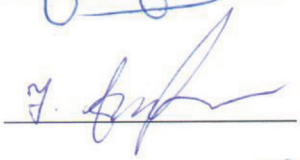
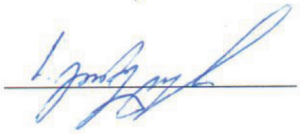
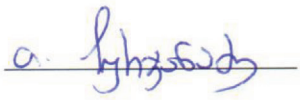
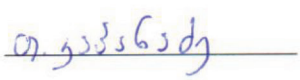
34 National Service of Statistics of Georgia – number of students at the educational establishments in 2018-2019 – there are 584,374 students registered at the educational establishments

35 For example IOS system

maps and under the recommendation of the EMS plan implement active works to depict disaster risks on the spatial maps.

TO THE EMERGENCY MANAGEMENT SERVICE:

- For the purpose of raising public awareness, it is importnat to develop awareness raising plan and methods, which would be aimed at respective target groups. Also, it is important to introduce evaluation practice for the planned measures;
- For ensuring efficiency, the service should popularize already created products (video-lessons, web-page, mobile application).

Auditors:	Signature
Temur Chilindrishvili Chief Auditor	
Sesili Tabatadze Senior Auditor (Team Leader)	
Shorena Arghvliani Senior Auditor-Asistant	
Revaz Gomelauri Auditor-Asistant	
Tamar Burjanadze Auditor-Asistant	
Tornike Kapanadze Auditor-Asistant	

State Audit Office of Georgia
96 St Ketevan Dedopali ave., Tbilisi 0144, Georgia
+995 32 243 84 38
SAO.GE