EUROPEAN UNION

ROMANIAN GOVERNMENT

SERBIAN GOVERNMENT

Structural Instruments 2007 - 2013

JOINT MANAGEMENT OF FLOOD RISKS

PROJECT MIS ETC CODE 1283

JOINT MANAGEMENT FOR RISK PREVENTION IN EMERGENCY SITUATIONS WITHIN ROMANIA-SERBIA CROSS-BORDER COOPERATION

TRAINING FOR EMERGENCY STRUCTURE STAFF

Module 1: Risk Assessment
Module 2: Prevention
Module 3: Preparedness

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia

We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

Table of Contents

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

Module 1: Risk Assessment

Topic 1: Concept, Classification and Characteristics of Emergency Situations

The self-defence instinct and, at the same time, the self-preservation of the human being in hazardous situations have been the instincts that ensured the survival of a population in limit situations, military leaders having had, since ancient times, the priority mission of protecting civil population (elder people, children, women) in case of war.

In a certain moment of its existence, each community survived disasters and continued to grow and flourish.

Throughout time, the concept of people protection has evolved from organizing the protection of a population in case of war to protecting the population against all types of identified risks: risks related to natural or anthropic disasters, economic and social risks, as well as risks produced by military conflicts (a category that is not part of the herein presentation).

Although measures for preventing the negative effects of extreme natural manifestations have probably been taken ever since the first contacts between man and nature, the concerns for setting out a unitary and standard terminology in the field are much more recent, and they only date since the second half of the 20th century and, especially, since its last decade.

The efforts to define and to name, as accurately as possible, extreme natural phenomena have led to developing an operational terminology used nowadays by the majority of researchers involved in this direction.

HAZARD

It is a threatening event or the likelihood for a phenomenon, potentially producing damages in a certain area, to take place in a certain timeframe mentioned (*Internationally agreed glossary of basic terms related to disaster management*, DHA, 1992).

In this context, *hazard* represents the likelihood for a natural or anthropic phenomenon, hazardous for human kind, to take place in a certain period of time and whose consequences are caused by exceeding the safety measures any society imposes to itself.

Any hazard involves a pre-existing risk level of the considered space (Alexander, 1993, Wilhite, 2000, Smith, 2001). Therefore, assigning the degree of hazard to a natural phenomenon is not subject to producing material damages or victims, but to the potential of such consequences.

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

The right understanding of the relations between *hazard, vulnerability, risk and disaster* determines the accurate use of terminology. These relations are integrated by Alexander (1993) as follows: "Hazard can be seen as a pre-disaster situation, in which there is a certain risk for a disaster to take place, especially because of the fact that a human community is placed in a vulnerable position".

DISASTER

According to the United Nations, under **disasters** one should understand a serious damage of the society, producing important human and material losses, or major changes of the environment, exceeding the response capacity of that community, by using own available means. The affected society needs an outside extraordinary support in order to be able to return to normal.
Disasters are determined by risks as rare and extreme events, occurred in the natural environment or generated by human activity that negatively affects human life, the property, the environment or the social – economic activity.

According to their nature, hazards are classified in:

1. Natural hazards:

a) *Endogen:* volcanic and/ or related to earthquakes;
b) Affecting mountainsides: landfalls, mud and debris flow, collapses, mass displacement, avalanches, surface erosion;
c) *Climatic:* cyclones and tornadoes, tropical and extratropical storms, hurricanes, drought and desertification, other climatic hazards (lightning and thunders, blizzard, frost and hoar, ice build-ups)
d) *Hydrologic and oceanographic:* floods, Tsunami waves; EL NINO-South oscillation, rise of the World Ocean level, sea ice and icebergs.
e) *Biological, biophysical and astrophysical:* insect invasion, fires, meteorite fall.

2. Anthropic hazards:

a) Industrial and related to transports;
b) Wars and nuclear accidents - their effect on society and environment.

In the national legislation, by **disaster** one understands an event caused by the initiation of certain types of risks because of natural or human causes, generating human or material losses or environmental changes and that, by their dimension, intensity and consequences, reaches or exceeds specific levels of seriousness set out by regulations regarding the management of emergency situations issued and approved by Law (Law 481/ 2004).

EMERGENCY SITUATION

It is defined as an exceptional non-military event that, by its dimension and intensity, threatens people's life and health, the environment, important material

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

and cultural values, while, for resetting normality, it is necessary to take urgent measures and actions, to assign additional resources and to unitarily manage the forces and means involved (Government Emergency Ordinance – O.U.G. 21/ 2004).

Disasters are determined by **risks** as rare and extreme events, occurred in the natural environment or generated by human activity that negatively affects human beings, the environment or the social- economic activity.

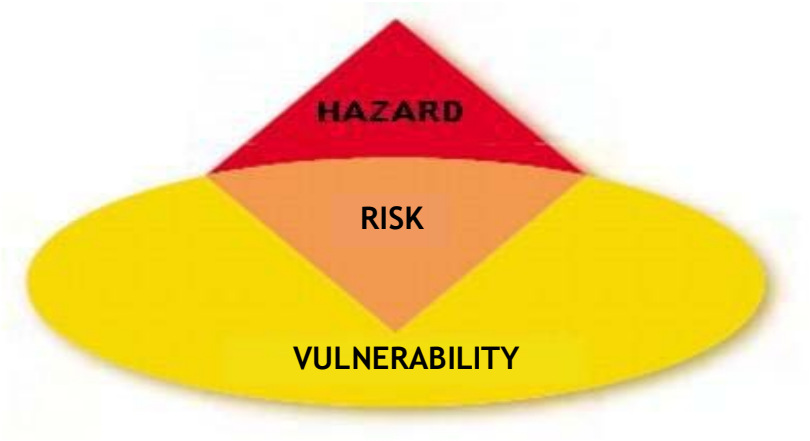
RISK

Risk is sometimes considered the synonym of hazard, but the first term also has a series of additional implications. More precisely, hazard is defined as a potential threat to people and their possessions, while ***risk*** as the likelihood for a hazard to take place.

There is no worldwide accepted definition of the risk, as perceptions are different from an individual to another and from a culture to another. In the context of managing the risk of disasters, the following definition is accepted:

Risk represents the likelihood for a hazardous event to occur, by unfolding with a certain force, in a certain place and in certain a period of time. Risk refers to people and objects exposed to the risk of some natural events to take place.

Figure 1: Concept of Risk



Explanations (for figure1): locations and populations in the yellow area are characterized by certain types of vulnerability; those in the red and orange areas are threatened by natural disasters. In any case, risk might only occur in the orange area, where hazard and vulnerability coexist.

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

Risk is something that has not yet taken place, something that it is estimated to happen in the future. If a risk is anticipated as very high, then there are 2 possibilities: eliminating the risk or reducing it as much as possible.

In the national legislation, by **risk** one understands the foreseen level of losses, likely to happen, estimated in victims, damaged properties, disturbed economic activities, impact on the environment due to a hazard taking place in a certain area and by referring to a certain time *(Romanian Government Decision – H.G.R. 642/2005)*.

VULNERABILITY

Vulnerability represents the level of losses expected by an element or a group of elements *(people, structures, goods, services, economic or social capital, etc.) that is exposed to a certain risk, following a disaster or a hazard. Vulnerability is determined on a scale from 0 to 1, or from 0% to 100% (suggested definition in the Internationally agreed glossary of basic terms related to disaster management (DHA, 1992))*.

Vulnerability can only be identified and studied with references to a certain type of a specific hazard. The vulnerability of a specific type of hazard varies, based on sector and context: for example, in populated areas, vulnerability comes from the low quality of buildings and base infrastructure, in the field of health, it occurs following the lack of medicine supplies and first aid kits, while in the field of economic activities, such as agriculture, it occurs following the shortage of stocks, etc.

The vulnerability of a population or of an ecosystem involves different and interdependent factors that have to be taken into consideration when determining the vulnerability of a family, a locality or a country. It is like a spider web in which physical factors are closely connected to economic, cultural, political, institutional, ecological and other factors.

In order to ensure a common understanding in the process of *risk element assessment*, one also has to be aware of a series of definitions agreed at the level of the authorities in charge of the management of risks generating emergency situations, such as:

Acceptable risk: It represents the level of potential losses that a society or a community considers endurable, given the specific social, economic, political, cultural, technical and environmental conditions.

Exposure: It is represented by all the people, properties, systems or other elements existing in hazard areas that can bear certain losses. The exposure is variable according to the moment the event takes place, which can generate a different impact.

Impact: It represents the negative effects of a hazard, expressed as impacts on population, as economic and environmental impact, and social and psychological impact.

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

In Romania, **the classification of the types of risks generating emergency situations** is regulated by H.G.R. 557/2016, as follows:

TYPE OF RISK	ASSOCIATED RISK
1. Storms and Snow Storm	Snow storm
	Storms - strong wind and heavy precipitation
	Hail
2. Floods	Floods following a natural overflow of watercourses caused by the increase of flow capacities resulting from precipitation and/ or sudden melting of snow or blockage caused by undersized discharge openings of bridges and footbridges, blockage produced by ice or floating items (waste and wood material), landfalls, alluvium and snow avalanches, as well as floods caused by discharges from mountainsides.
	Floods caused by incidents, accidents or failures in hydro-technical constructions
3. Heavy Snowfalls	Heavy snow
	Blocking of highways and railways
4. Tornadoes	
5. Drought	Hydrologic
	Pedological
6. Extreme Temperatures	Ice build-up, hard rime, early or late frosts
	Glaze ice
	Ice bridges and dams on water (ice dam)
	Heat
7. Vegetation Fires	Fires at the level of forestry area
	Fires at the level of grasslands and/ or scrublands
	Fires at cereal crops
8. Avalanches	
9. Landfalls	
10. Earthquakes	
11. Accidents, Failures, Explosions and Fires in Industry, Including Landfalls Caused by Mine Exploitations or Other Technological Activities	
12. Accidents, Failures, Explosions and Fires in Activities of Transport and Storage of Hazardous Products	Major accidents with site implications
	Major accidents with implications outside the site
	Accidents with hazardous products during transport activities
13. Accidents, Failures, Explosions and Fires in Transport Activities	Terrestrial
	In the air
	Marine
	Road tunnels
	Railway tunnels
	At the subway
	On the cable
14.Accidents, Failures, Accidents or Other Events in Nuclear or Radiological Activities	

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

15. Water Pollution	That endangers human life, water environment and major water supply facilities
	With a major cross-border impact
	Accidental pollutions of watercourses
	Marine pollutions in the coastal area
	Marine pollutions
16. Collapses related to Constructions, Installations or Facilities	
17. Failure of Public Utilities	Important radio and TV networks
	Important communication and information networks
	Important electricity and gas networks
	Important thermal networks
	Important sewage and used water and rainwater treatment networks
	Break of dams or other incidents leading to flow capacity discharge, endangering human life
18. Falls of Atmosphere and Space Objects	
19. Unexploded or Un-deactivated Ammunition Left from Military Conflicts	
20. Infectious Disease Outbreaks	
21. Epizootic Diseases/Zoonosis	
22. Radiological Risk	
23. Fires	
24. Situations Determined by the Attack of Plant Damaging Bodies	

Classification of risks potentially generating emergency situations in subsequent norms:

OMAI (Order of the Ministry of Administration and Internal Affairs) 192/2012 decides, based on some specific thresholds defined by the ***National Meteorological Administration***, the following disaster generating factors:

a) Floods, following natural overflows of watercourses caused by the increase of flow capacities resulting from precipitation and/ or sudden melting of snow or blockage caused by undersized discharge openings of bridges and footbridges, blockage caused by ice or floating items (waste and wood material), landfalls, alluvium and snow avalanches, as well as floods caused by discharges from mountainside;

b) Floods caused by incidents, accidents or failures at hydro-technical constructions;

c) Floods caused by the rise of underground water level;

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

d) Hazardous weather phenomena: heavy rains, heavy snow, storms and snow storms, ice build-up, hard rime, glazed frost, early or late frosts, heat, hail and droughts;
e) Floods caused by marine storms;
f) Hydrologic droughts (shortage of water at the source because of an extended drought);
g) Accidental pollutions of watercourses and marine pollutions in the coastal area.

The following are directly or indirectly exposed to these disasters:

a) Human life and people's possessions, as well as animal life;
b) Social, cultural, administrative and patrimony facilities;
c) Productive units (commercial companies, industrial platforms, electric stations, agricultural – animal farms, fish facilities, harbours and others);
d) Dams and other hydro-technical works representing downstream risk sources, in case of accidents taking place;
e) Means of road, railway and marine communication, electricity and gas supply networks, water supply and sewage systems and sources, treatment stations, telecommunication networks and others;;
f) Natural environment (water and terrestrial ecosystems, forests, agricultural lands, urban areas of localities and others).

OMAI 1475/2006 defines the criteria that are taken into account when a disaster is declared, as follows:

- Fall of precipitation, at least triple than the multiannual average considered, within the catchment area, caused by activities and leading to massive floods in that area;
- Invasion of hazardous agents and contamination of agricultural crops with phytosanitary products;
- Forest fires;
- For hail prevention, a heavy natural weather disaster is considered when, following activities, a layer of hail of minimum 5cm is produced on more than 25% of the surface of the protected area.

The following are directly or indirectly *exposed to these disasters*:

a) Population, as well as its movables and immovable;
b) Social facilities;
c) Productive units (commercial companies, electric stations, agricultural – animal farms, fish facilities, and others);
d) Means of road and railway communication, electrical and gas supply networks, water supply and sewage systems and sources, treatment stations, telecommunication networks and others;
e) Natural environment (forests, agricultural lands, urban areas of localities and others).

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

Bibliography:

Government Emergency Ordinance No. 21 as of April 15, 2004 regarding the National Emergency Management System;
Law No. 15 as of February 28, 2005 for approving Government Emergency Ordinance No. 21/ 2004 regarding the National Emergency Management System;
Law No. 481 as of November 8, 2014, regarding civil protection reissued on the grounds of Art. II under Law No. 212/ 2006;
Decision No. 557 as of August 3, 2016 regarding the management of types of risk;
Order No. 192 as of August 2, 2012 for approving the Regulation regarding the management of emergency situations generated by floods, hazardous weather phenomena, accidents at hydro-technical constructions, accidental pollutions on watercourses and marine pollutions in the coastal area;
Order No. 1475 as of October 13, 2006, for approving the Regulation regarding the monitoring and management of emergency situations in phytosanitary field - invasions of hazardous agents and contamination of agricultural crops with phytosanitary products and the Regulation regarding the management of emergency situations following forest fires.

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access **www.romania-serbia.net**

Topic 2: Risk Assessment of Emergency Situations

Risk Assessment in Emergency Situations

Emergency situations are various and, generally, unexpected. Therefore, the plans for preventing the effects of emergency situations and for intervention in such cases are difficult and hard to accomplish. The difficulty is related to the diversity of situations, of conditions and of encouraging or discouraging factors. The difficulty in conceiving, issuing, implementing and applying such plans consists in the intervention of many casual factors, in the impossibility to foresee all events that emergency situations include and create.

Most of the EU member states have developed risk assessment methodologies, adopted in the national legislation and already operational at the present moment. These evolutions exist, by taking into account that, starting with 2010, for improving member states' abilities to respond to identified risks, by means of prevention, preparedness and intervention measures, the European Commission has initiated a process of creating a unique methodological frame for a risk assessment that would allow elaborating some common European strategies and politics, based on some comparable results at the level of the EU. A common European frame has the purpose to better manage and distribute resources, in order to operatively and efficiently prevent and manage the negative effects of disasters and other risks at the level of the European Union.

The Guiding Lines expressed at the level of the European Commission create an analysis frame that is common to all Member States. The objectives of these guiding lines, include, among others:

- Using the good practices of international standards in the EU and developing a common approach of risk assessment;
- Creating an instrument regarding risk assessment for key players, especially those in the field of disaster management;
- Supplying information for specialized institutions such as: UNISDR (United Nations International Strategy for Disaster Reduction) and UN-OCHA (United Nations Office for the Coordination of Humanitarian Affairs);
- Developing the knowledge of policies regarding disaster prevention at different administrative levels;
- Supplying resource information regarding ways of prioritizing and assigning investments for preventing, preparing and setting out rehabilitation measures;
- Increasing people's level of awareness on disaster prevention measures;
- Supplying information for setting out a database at European level, with the capacity to assist in case of a disaster.

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

The European Commission promotes a unitary approach for risk assessment at national level, with the purpose of:

- A better understanding of risks the EU member states are dealing with;
- Member states' facilitating the cooperation and putting together of resources in managing risks that could affect different regions or states within the EU (cross-border risks);
- A unitary approach of risks;
- A better impact assessment act by setting out aspects that have to be taken into account;
- A better transparency of information regarding risks and their impact at the level of member states;
- A higher consistency and comparability of used data, used indicators, data processing and collection methodology and of models developed based on data collected from the site.

Risks are part of people's daily life. Life without risks is neither possible, nor imaginable. In any case, both the tolerance level and the risk perception vary from an individual to another. An individual can take a short turn with 50 km/h, and another individual can take a turn with 80 km/h, and all depends on their own risk assessment. Furthermore, perception varies based on regions, societies and cultures. There are countries, for example, that have nuclear stations for producing electricity, without any restraint, while other countries see such thing as very risky.

There is no worldwide accepted definition of the risk, as perceptions are different from an individual to another and from a culture to another. In the context of managing the risk for disasters, the following definition is accepted:

Risk represents the likelihood for a hazardous event to occur, by unfolding with a certain force, in a certain place and in certain a period of time. Risk refers to people and objects exposed to the risk of some natural events to take place.

Figure 1: Concept of Risk

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

Explanations figure 1: locations and populations in the yellow area are characterized by certain types of vulnerability; those in the red and orange areas are threatened by natural disasters. In any case, risk might only occur in the orange area, where hazard and vulnerability coexist.

In order to perceive, understand and assess the risk, experience and a vast background in the field are needed.

Risk is something that has not yet taken place, something that it is estimated to happen in the future. If a risk is anticipated as very high, then there are 2 possibilities: eliminating the risk or reducing it as much as possible.

Taking into account the increase of poverty level, we have noticed that there are more and more cases in which the affected population accepts a high level of risk, by living in populated urban centres, in places with abrupt hills or in floodable areas. There also are those persons who accept living close to industrial areas or close to nuclear centres, and who refuse moving because, by doing such, they would lose their jobs and other benefits. How much risk is perceived depends on the available information on possible types of hazards. The proper information on support possibilities in case of hazards leads to increasing risk awareness and perception.

The right understanding of the relations between **hazard, vulnerability**, **risk and disaster** determines the accurate use of terminology. These relations are integrated by Alexander (1993) as follows: "**Hazard** can be seen as the pre-disaster situation, in which there is a certain **risk of a disaster to take place**, especially because of the fact that a human community is placed in a **vulnerable** position".

Mathematically, risk can be expressed, in a simple manner, as the product between hazard, risk elements and vulnerability:

$$R = H . E . V$$

In which,

R = risk, **H** = hazard, **E** = elements exposed to risk, **V** = vulnerability. Hazard and vulnerability are essential for risk assessment: hazard, as likelihood for a hazardous natural event to occur, and vulnerability, as the harming and damaging susceptibility of the event occurrence and the ability to protect yourself. This thing leads to the risk phenomenon as a product of these two elements, expressing the occurrence likelihood and the dimensions of possible disruptions – in other words, the possible losses or disruptions.

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

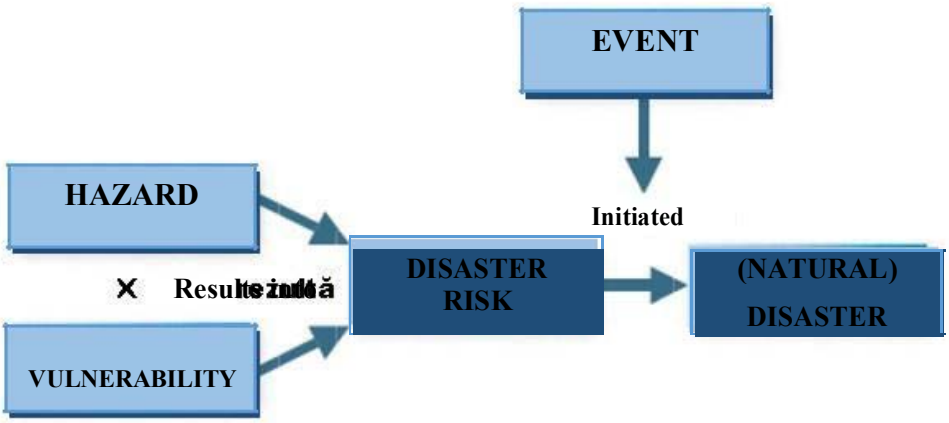


Figure 2: Disaster Risk as a Product between Hazard and Vulnerability

Hazard and vulnerability must simultaneously coexist in the same location, in order to refer to a risk that can subsequently become a disaster, if events really take place.

It results that the risk is based on the hazard size, on all groups of people and their possessions and their vulnerability. Based on this formula, calculations can be made to assess damages caused by different natural or technological phenomena.

Hazard and vulnerability must simultaneously coexist in the same location in order to refer to a risk that can subsequently become a disaster, if events really take place. A society can be vulnerable to floods, but also to earthquakes (and vice versa). Vulnerability can only be identified and studied with references to a certain type of a specific hazard. The vulnerability of a specific type of hazard varies, based on sector and circumstance: for example, in populated areas, vulnerability results from the low quality of buildings and base infrastructure, in the field of health, it comes from the lack of medicine supplies and of first aid kits, while in the field of economic activities, such as agriculture, it is caused by the shortage of stocks, etc.

The vulnerability of a population or of an ecosystem involves different and interdependent factors that need to be taken into consideration when determining the vulnerability of a family, of a locality or of a country. It is like a spider web in which physical factors are closely connected to economic, cultural, political, institutional, ecological and other factors.

Hazards produce chain impacts and can vary by length. Heavy rain seen as an extreme natural event, may, for example, cause damages to roofs built with easily damaged materials (direct impact), but, for the majority, direct physical hazards and the causes for damage occurrence are consequences of heavy rains, mainly floods, landfalls, soil erosion etc. (impact of chain phenomena).

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

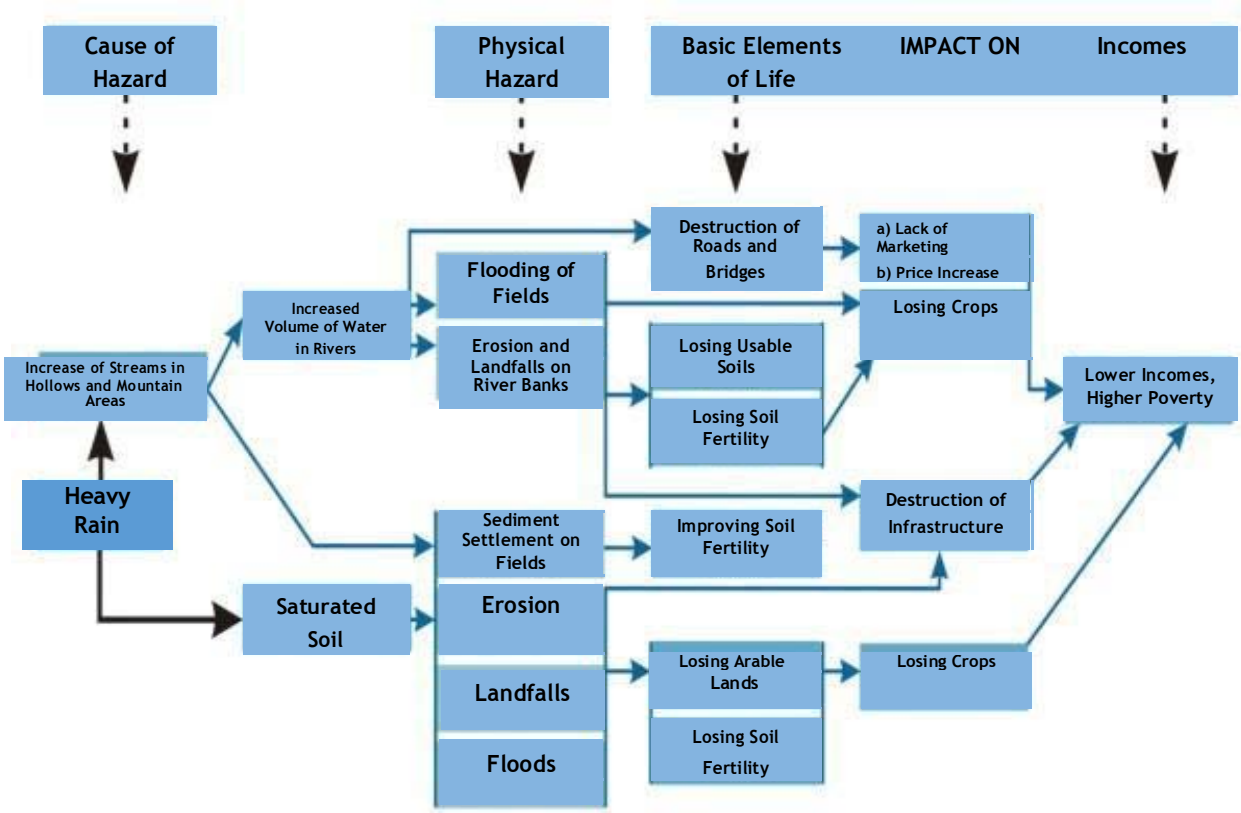
The topic of hazard analysis includes direct physical hazards as part of what a chain impact can be. A direct physical hazard is the hazard perceived as such by the affected population. As an example, the effects of the heavy rain – floods, landfalls and soil erosion can be mentioned, and not the heavy rain itself.

However, this thing happens if the heavy rain really generates such extreme events as floods, landfalls and soil erosion, as a result of the given features of the location (catchment areas, abrupt hills, lack of vegetation, soil infiltration rate) and of vulnerability factors, and it also occurs if there are elements vulnerable to these secondary types of hazards (for example sloping roads or fields, facilities in low areas, etc.)

How much an event can get to the feature of a hazard also depends on the location taken into consideration: heavy rains in mountain areas are not hazardous for a lower liveable area – the hazard comes from a flood resulting from rain, and even in such a case, only if the facility is vulnerable to this phenomenon. In the case of an unprotected road located on the level curve, the hazard is represented by landfalls that can be caused by heavy rains. The hazard generated by a heavy rain falling in a higher area depends on the existence of vulnerable elements in that area.

The extent of the damages (mainly in agriculture as an important income source) produced by heavy rains depends on a series of processes, impacts and vulnerability factors. These are illustrated in figure 3 – presenting the chain impacts of heavy rains in agriculture.

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net



In this case, the impacts of the heavy rain are turned into physical hazards, and, therefore, in damages, such as landfalls, floods and soil erosion.

Chain Impacts

Heavy Rain > floods > land falls, soil erosion, loss of soil fertility > decrease of soil utility > low agricultural production > increasing poverty > cleaning new agricultural lands that are not proper for the location > improper use of land > soil compaction > low rate of water infiltration in soil > a higher surface for a stream to unfold during the following heavy rain > increase of number of floods > increase of landfalls and soil erosions > etc.

These chains of connections and interactions are very important for the assessment of the associated risk and of the imposed risk in events of extreme hazard, but also in all the other events involving a level of intervention risk. Usually, events that require the intervention in risk conditions put together both causes and effects, so that the risk always tends to its maximum limit. Putting them together is however, most of the times, casual and, consequently, unpredictable. For this reason, risk calculation in case the events (earthquakes, floods, storms, avalanches, land disruptions, dam breaks, etc. intended industrial

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania - Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

accidents or amplified by them) is very difficult, but absolutely necessary, as it ensures a risk pre-assessment.

On the contrary, the risk becomes significantly higher, as the intervention is carried out in the unknown, in unsafe conditions, that can generate most serious effects. All emergency intervention structures take into account such situations in which putting together causes and effects generates extremely high risks. Knowing and assessing them beforehand can lead to reducing the level of risk or at least to controlling the risk, which is very important both for the quality and efficiency of the intervention, and for personnel's security within intervention teams.

Types of Indicators for Assessing Extreme Risk Events

No.	Assessment Indicators	Description of Indicators
		Status Indicators
1	**Presence**	(Human and technical) sources of data and information, sensor systems, databases, etc. and, obviously, the monitoring teams supply data regarding the presence of some signs for possible events of extreme risk, of those ongoing and of the effects of the previous ones.
2	**Consistency**	Analysis and monitoring teams, other elements of SNMSRE (National Extreme Risk Management System) make analyses and assessments regarding the consistency of indicators and signs helping in measuring an event on a hazard and threatening scale from their non-existence up to the highest level (maximum hazard, imminent and very serious threat, etc.), as well as the degree of the involved, assumed or imposed risk, from the non-existence of the risk to the extreme risk)
3	**Antecedent**	Analysis and assessment teams analyse all previous events (earthquakes, heavy rains, floods, natural calamities, nuclear accidents, technological accidents, environmental accidents, etc.) and elaborate statistical documents and related conclusions. SNMSRE builds up a table with necessary and useful indicators regarding the analysis of previous events.
4	**Structure**	Analysis and assessment systems take into consideration indicators related to the structure of events generating emergencies and those urgent (indicators for notifying the event, indicators related to the nature of the event, its structure, for example: heavy rains with electric discharges and strong wind, tornadoes)
5	**Development**	This phase covers the indicators, during its unfolding, regarding covering area, amplitude, intensity, force, term, etc.
6	**Inter-conditioning**	This stage includes the connection indicators (for example, the association between heavy rains and floods or between industrial accident and environmental pollution, etc.)
		Progress Indicators
1	**Interaction**	Indicators supplying data on the interactions between event constituents during its evolution are identified and analysed
2	**Evolution**	Variability, intensity, amplitude, force, in the progress of the event
3	**Assessment**	Assessment scales (for example: Richter scale, Mercalli scale, in case of earthquakes, depth, etc.)
4	**Transformation**	Indicators for passing from one status of the event to another (for example: turning a storm into a tornado)
5	**Forecast**	Indicators generating a vision on the occurrence of an event, the future development of an event, the evolution, its transformation or

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

		amplification are taken into account
		Completion Indicators
1	Results	Indicators regarding the relation between main parameters of the event of extreme risk, the quality of the intervention and the results obtained following the intervention
2	Effects	This stage takes into account the chains of effects (foreseen, anticipated, produced, but also collateral, undesired, accidental, consecutive - databases can be built up for the effects serving for their comparative analysis, etc.)

The risk analysis offers a response to the question: "What could happen in a certain circumstance?". The risk can be assessed as a function of the likelihood for a damage to take place and of the likely consequences, while it is understood as a measure of the size of a natural "threat".

Risk analyses represent therefore the support for the decision - making process in taking specific measures, meant to lead to limiting and diminishing the hazard (risk management). However, adopting measures is based on the systematic model supported by *the concept of risk*.

The concept of risk was developed for the first time in nuclear industry and research, while it currently covers a large area of applicability. It consists of three elements:

1. *Risk analysis* represents a systematic action of characterizing and, if possible, of quantifying a risk, from the point of view of the likelihood of its unfolding and of the sizing of its consequences.
2. *Risk assessment* represents a subsequent stage, of deciding the significance of the acceptable risks that is carried out by administrative factors, based on comparing advantages and disadvantages involved in a possible event.
3. *Risk management* refers to implementing measures and methods, for the purpose of reaching the safety level targeted, by adjusting to environmental transformations.

Risk scenarios represent a description method for creating an analysis base for making future decisions regarding risk prevention and management. A scenario *"offers a communication method regarding a common image of future uncertainties and factors able to influence decisions that should be made at the present time"*.

Scenarios allow an analysis, based on the reference situation. Secondly, the timeframe in which developed scenarios can be located is important. These aspects are important because they allow, within the process of building scenarios, making a difference between:

- Scenarios that are based on frequent historical antecedents and that have an important likelihood for happening (floods, accidents in hazardous transports, etc.);
- Scenarios that can develop indirect risks and have a longer development term (global heating).

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

In order to identify and describe realistic scenarios, it is recommended to use, especially in assessing natural risks, the first typology of scenario. This type of scenario is recommended because the data used have a higher liability degree, especially regarding the evolution of events and the probable impact.

In order to identify scenarios, it is necessary to involve specialists from more fields. Experts specialized in other fields can be involved next to experts specialized in sectorial risk.

The multi-discipline feature of the team will allow the identification and information development of the scenario in a more accurate way.

Bibliography:

Elements for the management of extreme emergency and risk situations - Dr. Gheorghe VADUVA
Firemen's Report No. 1(17) – 2008, Natural hazards – author: col.eng. Mihaita-Liviu DUMITRASCU
Master Course "Management of Emergency Situations" – Bucharest 2006

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

Topic 3: Management of Emergency Situations

Management of Emergency Situations

The emergency situation is characterized by its amplitude which represents the extent of the area its destructive effects take place, under which human life, the operation of democratic state's institutions, the values and interests of the community are threatened. Furthermore, the emergency situation is also characterized by its intensity that can be defined as the pace which destructive phenomena evolve with and the degree of normality disturbance. The previously mentioned elements have determined the law giver to regulate the management of the emergency situation.

From a legal perspective, the management of the emergency situation represents the set of activities developed and procedures used by decision makers, institutions and public service departments authorized to identify and monitor risk sources, to assess information and analyse the situation, to issue forecast, to set out variants of actions and to implement them for the purpose of resetting normality.

The management of emergency situations represents identifying, recording and assessing risks/ types of risks and their determining factors, notifying interested agents, warning the population, limiting, setting aside or fighting risk factors and, last but not the least, negative effects and the impact caused by negative/ exceptional events they can generate. In another train of thoughts, the management of emergency situations means applying policies, procedures and practices that have the identified objectives of analysing, assessing, treating, monitoring and reassessing risks in order to reduce them, so that human communities (citizens) can live, work and satisfy their needs and aspirations in a long lasting social and physical environment. In other words, the management of emergency situations has the main priority to increase the degree of civil safety.

Starting 2004, in Romania, for the purpose of *preventing and managing emergency situations, ensuring and coordinating human, material, financial and other resources needed for resetting normality*, **the National Emergency Management System (SNMSU)** was initiated *(based on O.G. - Government Ordinance - No. 21/ 2004 with subsequent amendments)*.

It is organized by authorities of the public administration and it includes a network of competent organizations, bodies and structures, organized on competence levels or fields, ***with the following structure***:

A. Committees for emergency situations:

- *National Committees for Special Emergency Situations/ National Committee for Natural Disasters (according to case);*
- *Ministerial committees and those of other central public institutions for emergency situations;*

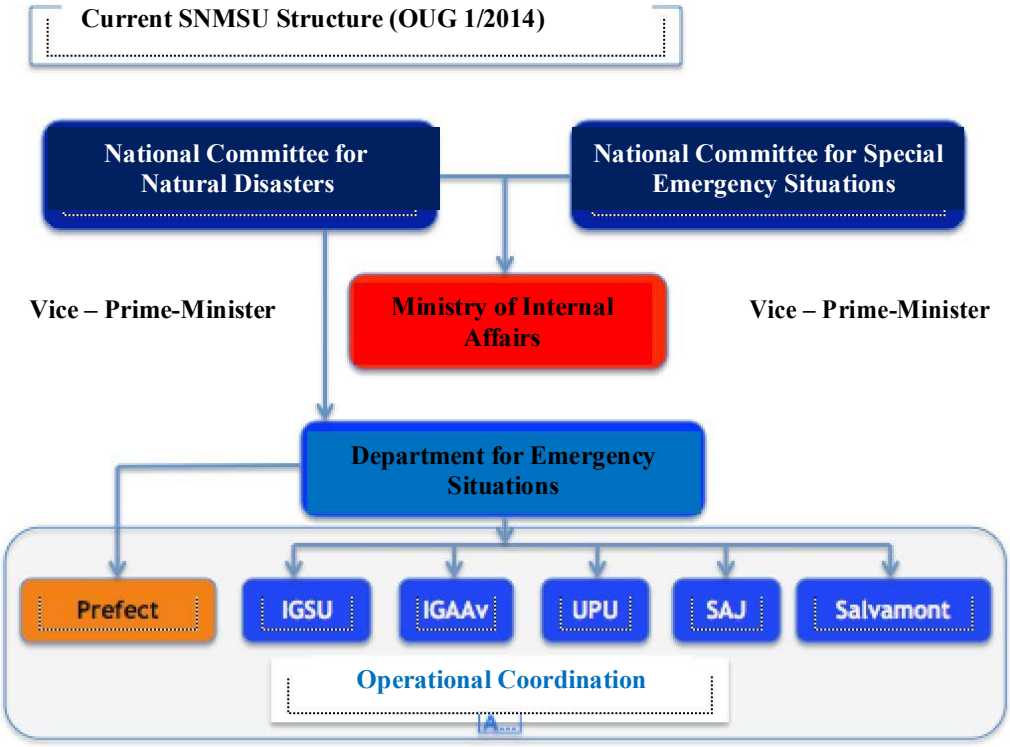
PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

- *County Committees for Emergency Situations, and The Committee of Bucharest Municipality for Emergency Situations;*
- *Local Committees for Emergency Situations;*
- *The General Inspectorate for Emergency Situations;*
- *Professional Emergency Services and Voluntary Emergency Services;*
- *Operative Centres and Centres for Intervention Coordination and Management;*
- *Action's commander.*

The Committees for Emergency Situations are inter-institutional bodies for the support of the management, ensured by its coordinators. They will organize and operate at national and local level.

The Ministerial Committees and those of other public institutions for emergency situations (consisting of decision makers, experts and specialists from their own department), are built and operate under the coordination of ministers, namely heads of national public institutions.

The diagram regarding the new emergency management system:



SNMSU - National Emergency Management System IGSU - General Inspectorate for Emergency Situations

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania - Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

IGAAv – General Inspectorate of Aviation
UPU – Emergency Receiving Unit
SAJ – County Ambulance Service

AT TERRITORIAL AND LOCAL LEVEL:

The Committee of Bucharest Municipality for Emergency Situations - consisting of the general mayor, sector mayors, heads of distributed, decentralized and communal management public services, institution managers, autonomous administrations, and commercial companies fulfilling functions for supporting the management of emergency situations, as well as managers of the economic agents that, by type of their activity, represent potential risk factors. The Committee is appointed following prefect's instructions;

County Committees for Emergency Situations - consisting of: president of the county council, heads of distributed, decentralized or communal management services, and other managers of institutions and commercial companies of county interest, fulfilling support functions in managing emergency situations, as well as managers of economic agents that, by type of their activity, represent risk factors. The county council is appointed under prefects' instructions.

Local Committees for Emergency Situations – at the level of municipalities, towns, sectors of Bucharest municipality and of communes - members: vice-mayor, the secretary of the commune, city or municipality, according to case, and representatives of public services and of main institutions and economic agents from the related territorial and administrative division, as well as managers or coordinators of economic agents, subsidiaries, branches or local working facilities, that, by the type of their activity, represent risk factors. The committee is appointed under the management of the mayor and with the approval of the prefect.

AT NATIONAL LEVEL:

The General Inspectorate for Emergency Situations (IGSU) - specialized body of the Ministry of Internal Affairs, ensures the unitary and permanent coordination of activities for the prevention and management of emergency situations. By means of the National Operational Centre, it ensures the permanent technical secretariat of the National Committee for Natural Disasters (CNCI) and the unitary coordination of interventions for the National Committee for Special Emergency Situations (CNSSU) and fulfils functions of monitoring, assessing, notifying, pre-warning, alerting and operationally and technically coordinating, at national level, structures with responsibilities in the management of emergency situations.

For the coordination and management of actions during the occurrence of emergency situations, at national level, the National Centre of Intervention Coordination and Management is activated, while its structure is designed for

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

supporting the decision, and it is activated following the instructions of the Head of Department for Emergency Situations (MAI – Ministry of Internal Affairs) and that includes specialists and experts, representatives of national structures existing within CNCI/ CNSSU.

Operative Centres – at the level of ministries and of other national public institutions with complex tasks and functions in managing emergency situations – fulfilling the same functions as IGSU (General Inspectorate for Emergency Situations), in fields of competence of ministries and national public institutions at whose level they operate.

AT LOCAL LEVEL:

Professional Emergency Services, operating as County/ Bucharest Municipality Inspectorates – specialized bodies within the Ministry of Internal Affairs, ensure, at county level and at the level of Bucharest Municipality, the unitary and permanent management of activities for the prevention and management of emergency situations. By means of operational centres, it ensures the permanent technical secretariat of the County or Bucharest Municipality Committee and it fulfils functions of monitoring, assessing, notifying, pre-warning, alerting and operationally and technically coordinating emergency situations at county/ Bucharest Municipality level.

At the level of Bucharest Municipality and of counties, at the occurrence of an emergency situations, the Centre of Bucharest Municipality for Intervention Coordination and Management (CMBCCI) is activated, along with the County Centre of Intervention Coordination and Management (CJCCI), designed for the support of the decision of the Committee of Bucharest Municipality for Emergency Situations/ County Committee for Emergency Situations. CJCCI is activated at the proposal of the chief inspector of Bucharest Municipality Inspectorate for Emergency Situations/ of the County Inspectorate for Emergency Situations, with the approval of the prefect. CMBCCI/ CJCCI is the structure including specialists and experts, representatives of the structures existing within CMBSU/ CJSU.

Operative Centres with Temporary Activity – constituted when *declaring an alert condition* or when the situation requires it at the level of municipalities, cities and communes; during a regular period of time, they are ensured by persons specifically appointed within the own body of that authority;

Emergency teams – constituted during emergency situations at the level of endangered or affected commercial companies that work together with structures of the National System.

The management of emergency situations operates according to the following principles:

- Prevention and anticipation;
- Protection and saving the life of the population;

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

●Respecting people's liberties and fundamental rights;
●Taking responsibility for the management of emergency situations;
●Continuing the cooperation at regional, national and international level between similar organizations and bodies;
●Activities unfolding for managing emergency situations must be transparent, so that they do not worsen the already existing effects;
●Progress and continuity of the actions of managing emergency situations, from the level of local public institutions authorities to the national public institution level, according to the extent of their intensity and amplitude;
●Efficacy, an active co-working and a subordination from hierarchic perspective of constituents of the National Emergency Management System.

RISK FOR FLOODS

The management of emergency situations produced by floods is a topic of a, not only national, but especially local amplitude.

From my point of view, an important risk that I would like to approach is the flood risk and the implications of local public authorities, mainly of the Prefect Institutions, in the management of such risk.

Given the importance of managing the flood risk, the National Strategy for the Flood Risk Management has been elaborated. The purpose of this strategy is represented by diminishing the impact floods might have on citizens of the state and on their possessions, by means of a proper management and by policies able to respond to imposed standards, in order to protect the environment.

"The strategy of flood management builds up the framework document for preparing and adopting some specific measures and actions, covering:
Knowing the flood risk;
Monitoring the phenomenon of floods;
Informing population;
Considering the flood risk in all activities related to the activities of developing the territory;
Adopting preventing measures;
Preparing for emergency situation;
Reconstruction and learning from previous experience."

The strategy has 3 objectives: environmental, social and economic. Through the National Strategy for Flood Management, it is wished for improving the value of life by diminishing damages that floods may cause, as well as for a proper management of available means, in order to build, maintain and valorise the existing infrastructures and the means of diminishing the flood risk.

The prefect is the president of the County Committee for Emergency Situations.

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

According to Law No. 481 as of November 8, 2004, on civil protection, "The Prefect has the following main responsibilities:

Approving operative and preparedness plans on civil protection and the planning of exercises and of other activities unfolded at the level of the territorial and administrative division;

Keeping track of civil protection measures to be followed at the level of the territorial and administrative division;

Deciding, according to law, the calling of an alert condition, the activation or use, according to case, of intervention formalities;

Approving the territorial risk diagram issued by the Inspectorate for Emergency Situations;

Ensuring conditions for the good development and integration of activities of intervention teams from other counties or of international teams, according to case, arrived in the territorial and administrative division, for the purpose of limiting and setting aside disaster effects;

Submitting to the County Council or the General Council of Bucharest Municipality, according to case, the proposals for supplementing the population warning and notification system, the sheltering fund, the material base and other measures for people protection, or the protection of material goods, cultural values or environment;

Exercising control in implementing measures in civil protection situations."

The management of emergency situations generated by floods, hazardous weather phenomena, accidents at hydro-technical constructions and accidental pollutions is carried out by means of preventive and operative measures for intervention and rehabilitation, consisting of identifying, recording and assessing the types of risks and their determining factors, notifying interested agents, limiting, setting aside or fighting negative effects produced by risk factor manifestation.

The measures for limiting, setting aside or fighting the effects of types of risk, provided by Art. 5, represent an obligation for bodies of the national and local public administration with responsibilities in this field and for all legal entities and individuals, except for disabled persons, elder people, pregnant women and children.

Owners, by any right, of dams and other hydro-technical constructions whose failure or destruction might endanger the population and its material possessions, social facilities and productive units or it can cause prejudices to the environment, are under the obligation to maintain, repair and exploit them properly, to equip these works with measuring and control devices necessary for tracking their behaviour in time, to install warning – alerting systems for people in areas located downstream the dam, to ensure, in case of an imminent hazard, the alerting of the population from the risk area created following own activities unfolded, by

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

informing the Local and/ or County Committee of this, according to case, and the County Operational Centre and to organize the surveillance, intervention and rehabilitation activity according to regulations approved by water management permits, defence plans against floods, ice and accidents at hydro-technical constructions, action plans in case of accidents at dams and plans for the prevention and fighting against accidental pollution.

Types of risks generating emergency situations:

- ***Floods***, following natural overflows of watercourses caused by the increase of flow capacities coming from precipitation and/ or sudden melting of snow or blockage caused by undersized discharge openings of bridges and footbridges, blockage produced by ice or floating items (waste and wood material), landfalls, drifts and snow avalanches, as well as floods by discharge from mountainsides;
- ***Floods caused by incidents, accidents or failures at hydro-technical constructions***;
- ***Floods caused by the increase of the underground water level***;
- ***Floods caused by marine storms***;
- ***Hydrologic drought*** (shortage of source water due to an extended drought);

The following are directly or indirectly exposed to these types of risk:

- Human life and people's possessions, as well as animal life;
- Social, cultural, administrative and patrimony facilities;
- Productive units (commercial companies, industrial platforms, electric stations, agricultural- animal farms, fish facilities, harbours and others);
- Dams and other hydro-technical works representing a downstream source of risk, in case of accidents taking place;
- Means of road, railway and maritime communication, gas and electrical supply networks, water supply and sewage systems and sources, treatment stations, telecommunication networks and others;
- Natural environment (water and terrestrial ecosystems, forests, agricultural lands, urban areas of localities and others).

The management of emergency situations is carried out by:

a) ***Prevention and preparedness measures*** for interventions;
b) ***Urgent operative measures of intervention*** *after the occurrence of hazardous phenomena with serious consequences;*
c) ***Measures*** *of subsequent intervention for* ***recovery and rehabilitation***.

The defence condition generated by floods starts on the moment of noticing the occurrence of the hazardous phenomenon (exceeding critical thresholds) or when the likelihood of occurrence is set out by means of forecast.

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

Colour codes are assigned to these thresholds, as follows:

- ***YELLOW CODE***, in case the anticipated hydrologic phenomena can be temporarily hazardous for certain activities;
ORANGE CODE, in case the hydrologic phenomena estimated to be hazardous have a high intensity degree and can cause significant social and economic damages;
RED CODE, in case the hydrologic phenomena estimated to be hazardous can have disastrous effects, with a potential threat on lives and possessions.

In case of a source water shortage, caused by an extended drought – **hydrologic drought,** the following thresholds are set out:

NORMAL PHASE – when the source flow capacity is higher or equal to the warning flow capacity, but can ensure water requirements of use
WARNING PHASE – when the source flow capacity decreases, but can satisfy the minimum flow capacity necessary to use;
RESTRICTION PHASE – when the source flow capacity is lower than the minimum flow capacity needed for use.

The procedure for coding hydrologic warnings and alerts issued in case of hazardous hydrologic phenomena occurrence, at national or regional level.

In cases when forecasts show exceeding of defence levels for Danube or national rivers, as well as important discharges from mountainsides, streams, temporary hollows, rivulets, the National Institute of Hydrology and Water Management issues a hydrologic warning or a hydrologic alert, according to case, in which it summarizes the phenomenon, its intensity, its possible effects, the area that can be affected, the likely moment of its occurrence and the term, by mentioning the likelihood of hazardous phenomena occurrence.

The hydrologic warning is issued when the possibility of exceeding defence levels or the possibility of other hazardous hydrologic phenomena (important discharges from mountainsides, streams, temporary hollows and rivulets) is anticipated, based on weather forecast.

The hydrologic alert is issued when an imminent exceeding of defence levels and/ or the occurrence of other hazardous hydrologic phenomena *(important discharge from mountainsides, streams, temporary hollows, and rivulets)* is/are anticipated, based on weather forecast and river condition.

For indicating the intensity of the phenomenon generating high floods specific to an area or a river sector, the following colour codes will be used:

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

YELLOW: risk for high floods or fast increases of water level, not leading to significant damages, but requiring an increasing attention in case of carrying out seasonal activities and/ or activities exposed to floods;

ORANGE: risk for high floods generating important overflows, likely to have a significant impact on community life and people's safety and possessions.

Setting out defence thresholds as follows:

YELLOW: corresponds to the warning situation:

The warning situation means a special situation and does not necessarily represent any hazard.

The consequences of reaching the warning situation are:

Increasing the number of observations and measurements to be made for keeping track of the phenomenon and for the forecast of its evolution;

Checking the constructions with a defence role and keeping track of ensuring the conditions for high water discharge;

Informing of the possibility for an accidental pollution to take place.

ORANGE: corresponds to a flood situation:

The alert situation is characterized by an evolution of phenomenon to a possible hazard (for example: further increase of water levels, increase of flow capacities infiltrated through retention hydro-technical constructions and of carrying materials from their structure, increase of precipitation intensity and of wind speed, confirmed accidental pollutions that need interventions and others). Calling for an alert condition leads to entering the operative situation of the committees for emergency situations. The activities carried out are both activities meant to take control of the phenomenon, and activities preparing for the case a hazardous situation takes place.

RED: corresponds to a hazardous situation:

A hazardous situation starts when the hazard becomes imminent and it is necessary to take some exceptional measures for limiting the effects of floods (evacuating people, animals, material possessions, special measures in exploiting hydro-technical constructions with a role of defence against floods, traffic restrictions on certain roads and bridges, as well as on navigable means), as well as for preventing accidental pollutions with serious effects on the ecosystem (changing parameters of water quality, destruction of fauna and fish populations, environment, and others, or that exceed the field of competence).

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

The specific measures for defence against floods are:

Warning area measures, set out at hydrometrical stations and at pluviometry posts located upstream of endangered facilities, according to case, for precipitations, levels or flow capacities;

Defence local measures, set out close to facilities, under the form of levels or flow capacity.

The above defined specific measures of defence in case of floods are:

For watercourse areas that are dammed up:

- **Level of phase 1 of defence** – when the water level reaches the foot of the exterior bank of the dam on a third of its length;
- **Level of phase 2 of defence** – when the water level reaches half of the height between the level of phase 1 and the level of phase 3 of defence;
- **Level of phase 3 of defence** – when the water level reaches 0.5 – 1.5 m under the known maximum water levels or under the maximum level for which that dam has been designed or when exceeding a critical point.

For watercourse areas that are not dammed up:

- **Warning level** – the level at which the flooding risk is possible after a relative short time, in which defence or evacuation actions can be organized;
- **Flooding level** – level at which the flooding of the first facility starts;
- **Hazard level** – level at which special measures of evacuating people and possessions, restrictions for using bridges and roads, as well as special measures in exploiting hydro-technical constructions are necessary.

Bibliography:

Government Emergency Ordinance No. 21 as of April 15, 2004 regarding the National Emergency Management System;

Law No. 15 as of February, 2005 for approving the Government Emergency Ordinance No. 21/ 2004 regarding the National Emergency Management System;

Emergency Ordinance No. 1 as of January 29, 2014 regarding certain measures in the field of the management of emergency situations, as well as for amending and supplementing the Government Emergency Ordinance No. 21/ 2004 regarding the National Emergency Management System

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia

We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

Module 2: Prevention

Topic 1: Legal Obligation of Making Risk Assessment and Protection and Rescue Plans

Form a legal standpoint, the management of emergency situations represents the set of unfolded activities and procedures used by decision makers, institutions and public services authorized to identify and monitor sources of risk, to assess information and analyse the situation, to issue forecasts, to decide variants of action and to implement them for the purpose of resetting normality.

The management of the types of risk includes identifying types of risk and associated risks, setting out the authorities in charge, according to types of risk, setting out the fields of action for the responsible authorities, for preventing, preparing and responding to the event and recovering/ rehabilitating the situation, as well as distributing support functions.

The management of emergency situations represents identifying, recording and assessing risks/ types of risk and their determining factors, informing interested agents, warning the population, limiting, setting aside or fighting risk factors and, last but not least, the negative effects and the impact produced by the negative/ exceptional events they can generate.

In another train of thoughts, the management of emergency situations means applying policies, procedures and practices that have the identified objectives of analysing, assessing, treating, monitoring and reassessing risks in order to reduce them, so that human communities (citizens) can live, work and satisfy their needs and aspirations in a long lasting social and physical environment. In other words, the management of emergency situations has the main priority to increase the degree of civil safety.

In this context, *the new Government Decision No. 557/ 2016* clearly decides the responsibilities authorities and public institutions have for ensuring the management of the types of risk according to 5 fields of action:

- ***Prevention*** – set of actions taken by authorities in charge, consisting of identifying, assessing and reducing the risks for emergency situations to take place, for the purpose of protecting life, environment and possessions against their negative effects;
- ***Preparedness*** – set of prior measures and actions, included in the set of prevention and response activities, of permanent type and developed by authorities in charge;
- ***Response*** – set of actions carried out by authorities in charge, meant for planning, organizing, coordinating and operationally managing capacities involved in the operative intervention actions for limiting and setting aside

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

the negative effects of the emergency situation, until resetting the temporary normality condition;

- ***Research/ after-event assessment*** – set of actions taken by authorities in charge, for setting out and quantifying effects, causes and circumstances determining the occurrence of the emergency situation or its related events.

Furthermore, the types of risk are distributed according to the field of competence of the authorities in charge, according to Annex No. 1 of the decision. Authorities in charge, according to types of risk, are:

- Authorities and specialized bodies of the national public administration, including territorial structures under their subordination, authority or coordination;
- Authorities of the local public administration;
- Economic agents, permit owners.

Moreover, the types of risk are distributed according to the field of competence of the authorities in charge, according to Annex No. 1 of the regulatory deed.

By exception, in emergency situations caused by the simultaneous unfolding of more types of risk of by the unfolding of certain types of risk, others than those identified, at the request of the Head of Emergency Department within the Ministry of Internal Affairs, the National Committee for Special Emergency Situations can set out responsibilities including to ministries and bodies of the national and local public administration, others than those provided by Annex No. 1 of the decision.

At territorial level, the maximum efficiency management of emergency situations that may occur includes, among others, drafting of a document called: Risk Analysis and Coverage Plan and the Framework-Structure of the Risk Analysis and Coverage Plan.

For this purpose, the General Inspectorate for Emergency Situations, by means of the county inspectorates of Bucharest Municipality for emergency situations, plans to implement the provisions of ORDER No. 132 as of January 29, 2007 for approving the Methodology for drafting the Risk Analysis and Coverage Plan and the Framework – Structure of the Risk Analysis and Coverage Plan (PAAR).

The responsibilities on risk analysis and covering belong to agents that, according to law, have responsibilities or ensure functions of support for preventing and managing emergency situations at territorial level.

PAARs are issued by the County/ Bucharest Municipality Committee for Emergency Situations, and by Local Committees for Emergency Situations and it is approved by the County Council/ General Council of Bucharest Municipality, by local councils, corresponding to the territorial and administrative divisions they represent.

PAARs are issued and approved within 60 days after prefect's approval of the *"Territorial risk diagram in the territorial and administrative division"*, drafted by the County/ Bucharest Municipality Inspectorate for Emergency Situations and are

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

updated at the beginning of the year or whenever other risks, than those already analysed, or amendments to the organization of structures that, according to law, have responsibilities or ensure support functions regarding the prevention and the management of emergency situation at territorial level, occur.

Prefects, the general mayor of Bucharest Municipality and mayors are responsible for ensuring the necessary conditions for drafting PAARs.

In order to support the activity of risk analysis and coverage, county councils/ the General Council of Bucharest Municipality and local councils can request experts in the field to draft studies, forecasts and other specialized materials.

After drafting and approving, PAARs are placed at the disposal of the permanent technical secretariat of county/ Bucharest Municipality/ local committees for emergency situations, and excerpts of those documents are sent to the other institutions and bodies with responsibilities in preventing and managing risks generating emergency situations, while they have the obligation to be aware, in areas they are in charge of, of the content of the plans and to apply them according to specific emergency situations,

County/ Bucharest Municipality Inspectorates for Emergency Situations, by means of the operational centres, ensure the preparing, organizing and coordination of response actions, as well as the drafting of specific intervention procedures, according to the types of risks generating emergency situations.

Economic operators, public institutions, non-governmental organizations and other structures within the territorial and administrative division are under the obligation to place, at the disposal of committees for emergency situations, all documents, data and information requested for drafting PAARs.

The documents, data and information whose disclosure may prejudice the national safety and defence or may cause prejudice to a legal entity of public or private right, are subject to the rules and measures set out by the legislation on classified information protection.

Bibliography:

Order No. 132 as of January 29, 2007 for approving the Methodology for elaborating the Risk Analysis and Coverage Plan and the Framework - Structure of the Risk Analysis and Coverage Plan

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

Topic 2: Content of Risk Assessment of Natural Disasters and Other Accidents

The framework – structure of the Risk Analysis and Coverage Plan (PAAR) is provided in Annexes No. 1 and 2 to the "ORDER No. 132 as of January 29, 2007 for approving the Methodology for drafting a Risk Analysis and Coverage Plan and the Framework – Structure of the Risk Analysis and Coverage Plan".

The methodology sets out the purposes, objectives, responsibilities, as well as the main elements and stages to follow that have to be taken into account when drafting Risk Analysis and Coverage Plans.

The Risk Analysis and Coverage Plan, hereinafter called PAAR, includes potential risks identified at the level of territorial and administrative divisions, measures, actions and resources necessary for the management of those risks.

PAARs aim at ensuring that all agents involved are aware of the tasks and responsibilities they have before, during and after the occurrence of an emergency situation, at creating a unitary and coherent action frame for preventing and managing risks that generate emergency situations and at ensuring an optimal response in case of an emergency, proper to the type of risk identified.

PAAR **objectives** are:

a. Ensuring the prevention of risks generating emergency situations, by avoiding their unfolding, reducing their development frequency or limiting their consequences, based on conclusions resulted following the identification and assessment of types of risk, according to the territorial risk diagram;

b. Positioning and sizing operative units and of other forces meant to ensure the support functions on preventing and managing emergency situations;

c. Setting the concept of intervention in emergency situations and drafting the operative plans;

d. Assigning and optimizing forces and means necessary for preventing and managing emergency situations.

FRAMEWORK – STRUCTURE of the Risk Analysis and Coverage Plan

CHAPTER I – General Provisions

Section 1. Definition, Purpose, Objective

Section 2. Responsibilities on Risk Analysis and Coverage 2.1. Reference Regulatory Deeds

2.2. Organizational Structures Involved

2.3. Responsibilities of Bodies and Authorities with Responsibilities in the Field

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

CHAPTER II – Characteristics of the Territorial and Administrative Division

Section 1. Geographical Location and Relief
Section 2. Climatic Features
Section 3. Hydrographic Network
Section 4. Population
Section 5. Means of Transport
Section 6. Economic Development
Section 7. Local Infrastructures
Section 8. Regional/ Local Specificity

CHAPTER III – Analysis of Risks Generating Emergency Situations

Section 1. Analysis of Natural Risks
Section 2. Analysis of Technological Risks
Section 3. Analysis of Biological Risks
Section 4. Analysis of Fire Risks
Section 5. Analysis of Social Risks
Section 6. Analysis of Other Types of Risks
Section 7. High Risk Areas

CHAPTER IV – Risk Coverage

Section 1. Concept of Protection and Intervention Action
Development Section 2. Stages of Action Development
Section 3. Emergency Phases of Actions
Section 4. Protection and Intervention Actions
Section 5. Training
Section 6. Development of the Information- Decisional and Cooperation Flow

CHAPTER V - Resources: Human, Material, Financial
CHAPTER VI – Logistics of Actions

The following documents shall be attached to PAAR:

a) The list of authorities and agents who have responsibilities for the risk analysis and coverage within the territorial and administrative division, according to the model provided under Annex No. 1 that is part of the herein methodology;

b) The responsibilities of the authorities and the agents in charge covered by PAAR, according to the model provided under Annex No. 2 that is part of the herein methodology;

c) The nominal constituency of the structures that have responsibilities in managing emergency situations, by mentioning the division to which the members of the structures belong, their position, address and business and home phone numbers, their responsibilities and missions;

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

d) The potential risks in the neighbouring localities/ counties that can affect the competence area of the territorial and administrative division;

e) Risk maps;

f) Proper measures for avoiding risks unfolding, reducing the development frequency and limiting their consequences, according to types of risks;

g) The existing measures for pre-warning/ warning of reaching some critical values and for alerting population in case of evacuation;

h) A list including facilities that can be affected by an emergency situation taking place (earthquake, flood, landfall, technological accident, etc.)

i) Intervention plans and procedures;

j) Information and decisional flow diagram;

k) Evacuation places/ areas in case of emergency and their equipment;

l) Planning of exercises/ applications according to specific technical regulations;

m) Monthly information and analysis reports submitted to the prefect;

n) Cooperation protocols with similar institutions from countries with common borders, in case of certain emergency situations occurring;

n) Resource report, the inventory of existing defence means and materials, the way in which the shortage is covered from local available supplies and with support of the superior Committee for emergency situations, etc.;

o) Rules for reacting to an emergency situation.

Bibliography:

Order No. 132 as of January 29, 2007 for approving the Methodology for drafting the Risk Analysis and Coverage Plan and the Framework - Structure of the Risk Analysis and Coverage Plan

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

Topic 3: Methodology of the Risk Assessment of Natural Disasters and Other Accidents

ANALYSIS OF RISKS GENERATING EMERGENCY SITUATIONS

The analysis of risks covered by the risk diagram within the territorial and administrative division has to allow the understanding of mechanisms and of development/ manifestation conditions, their amplitude and their possible effects.

The analysis is carried out according to types of risks, based on data and statistics, as well as other available documents – studies, forecasts, etc. by taking into account as follows:

1. **Natural risks:**
2. **Technological risks;**
3. **Biological risks;**
4. **Fire risks;**
5. **Social risks;**
6. **Other types of risks.**

"Natural risk analysis" includes references to:

1. **Hazardous weather phenomena** – an analysis is developed on the areas where such phenomena took place, as well as on the possibility of their occurrence in other places.

a) Floods - an analysis is made on predictability of floods and on how much time ahead, on their dynamic effect and on the necessity to evacuate people, to install possible camps for the victims of a disaster, on the technical and maintenance condition of hydro-technical works, areas planned to be intentionally flooded, etc. and an inventory is made for constructions built in floodable areas, for the existence of some additional protection measures and an analysis is carried out on the possibility of moving those constructions in areas protected safe from floods.

a1) Storms, tornadoes, drought, frost, etc. - it is analysed if these phenomena are predictable and how much time ahead, what the localities/ lands/ facilities likely to be affected are and if it is necessary to evacuate people.

b) Forest fires – an analysis is made on the possibility of such fires to take place, their times and frequency, forest areas that can be affected.

c) Avalanches - an analysis is made on the possibility for such phenomena to take place, their times and frequency, localities and facilities that can be affected.

d) ***Destructive geologic phenomena;***

d1) Earthquakes - the following are taken into consideration: seismic macro- and micro-zoning of the national territory, characteristics of the fund built, statistics regarding victims and damages caused by previous years' earthquakes, areas built likely to be affected by a major earthquake.

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

d2) Landfalls – an analysis is made on known places where such phenomena take place, as well as possible new places where they might occur, land surfaces and buildings that can be affected, the necessity of evacuating people and installing possible camps for victims.

2. **"Technological risk analysis"** includes references to:

a) Industrial risks - an analysis is carried out on activities that involve major accident hazards involving hazardous substances, on types of hazardous chemical substances used in production;

b) Risks related to the transport and storage of hazardous products – potential accidents that can take place on the road, railway, river and sea network for the transport of hazardous materials, transport constituents and their destination.

b1) Road transport - the analysis of these risks takes into account the existing infrastructure, the transport of hazardous materials, transport constituents and their destination, number of accidents per kilometre and per year, etc.

b2) Railway transport - the analysis of these risks takes into account the existing railway network, the transport of hazardous materials, transport constituents and their destination, number of events and their frequency, annual amount of passengers.

b3) River and sea transport – an analysis is made on risks according to the existing harbours, navigable transport means.

b4) Air transport - risks are analysed according to the existing airports, their capacity and class, flight routes.

b5) Transport by main highways - risks are analysed according to the existence of transport highways, types of shipped products.

c) ***Nuclear risks*** – risks are analysed according to the existence of specific facilities and cross-border risks.

d) Water pollution risk – an inventory is carried out for the places where such phenomena took place, as well as for possible new places where they might occur, areas that can be affected.

e) Collapses of buildings, installations or facilities – an inventory is made in the buildings, installations and other facilities that are in an advanced stage of degradation and in which there is a risk of collapsing.

f) Failure of public utilities – an inventory and an analysis are carried out for systems, installations and equipment whose turn-off might lead to shutting down the water, natural gas, electricity and thermal energy supply for an extended area within the locality/ county.

g) Objects falling from the atmosphere or space - an inventory is made for the places where such phenomena took place and their consequences.

h) Unexploded ammunition – the existence of previous military conflict areas, where there might be some unexploded ammunition, is analysed, by also using statistics on pyrotechnic reclamation.

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

3. **"Biological risk analysis"** includes references to inventorying and analysing potential sources of outbreaks of infectious and epizootic diseases in constructions, animal farms, contagious disease hospitals, epidemiological analysis laboratories, colonies of workers, populated poor areas – without any public utilities, camps for victims or refugees, etc. – and accidental pollutions.

4. **"Fire risk analysis"** includes references to analysing and distinguishing fire risks according to context: fire and other emergency situation statistics, existing inventories in localities, economic operators, public institutions, etc., built fund, vegetation and vehicles.

5. **"Social risk analysis"** includes references to analysing social risks according to existing inventories of meetings, fairs, festivals and other periodic events with the participation of a large public group and possible social movements, according to the social policy and the labour force situation in the area.

6. **"Analysis of other types of risks"** includes references to analysing, based on statistics, most frequent interventions unfolded, such as: extrications, medical assistance and medical transport, release of people, water discharge from building basements, animal savings, etc.

The risk analysis activity can define geographic areas with a certain density of same types of risks, related to infrastructures and buildings, called *high risk areas*.

Elements taken into consideration in deciding high risk areas are:

- ***Activity areas developed along means of communication***.
- ***Public buildings***, either due to the number of persons, or due to their vulnerability, such as theatres, hotels, hospitals, schools, commercial centres.
- ***Technological installations***.
- ***Other elements***, *such as:* ***floodable areas, landfalls/ caving in sensitive areas, etc***.

From the point of view of the type of the territorial and administrative division, there are three categories of risk areas:

a) Urban risk areas;

b) Periurban risk areas: bordering communes, cities, industrial or commercial areas;

c) Rural risk areas.

Bibliography:

Order No. 132 as of January 29, 2007 for approving the Methodology for drafting the Risk Analysis and Coverage Plan and the Framework – Structure of the Risk Analysis and Coverage Plan

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

Module 3: Preparedness

Topic 1: Concept and Importance of Preparedness in Emergency Situations with Emphasis on Floods

Although measures for preventing negative effects of extreme natural manifestations have probably been taken ever since the first contacts between human beings and nature, the concerns for setting out a unitary and standard terminology in the field are much more recent, and they only date since the second half of the 20th century and, especially, since its last decade.

The efforts to define and to name, as accurately as possible, extreme natural phenomena have led to developing an operational terminology used nowadays by the majority of researchers involved in this direction.

HAZARD

It is a threatening event or the likelihood for a phenomenon, potentially producing damages in a certain area, to take place in a certain timeframe mentioned (*Internationally agreed glossary of basic terms related to disaster management*, DHA, 1992).

The right understanding of the relations between *hazard*, *vulnerability, risk and disaster* determines the accurate use of terminology. These relations are integrated by Alexander (1993) as follows: "Hazard can be seen as a pre-disaster situation, in which there is a certain risk for a disaster to take place, especially because of the fact that a human community is placed in a vulnerable position".

DISASTER

According to the United Nations, under **disasters** one should understand a serious damage of the society, producing important human and material losses, or major changes of the environment, exceeding the response capacity of that community, by using own available means. The affected society needs an outside extraordinary support in order to be able to return to normal.

Disasters are determined by risks as rare and extreme events, occurred in the natural environment or generated by human activity that negatively affects human life, the property, the environment or the social – economic activity.

According to their nature, hazards are classified in:

1. 1. Natural hazards:

a) *Endogen:* volcanic and/ or related to earthquakes;
b) Affecting mountainsides: landfalls, mud and debris flow, collapses, mass displacement, avalanches, surface erosion;

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

c) *Climatic:* cyclones and tornadoes, tropical and extratropical storms, hurricanes, drought and desertification, other climatic hazards (lightning and thunders, blizzard, frost and hoar, ice build-up)
d) *Hydrologic and oceanographic:* floods, Tsunami waves; EL NINO-South oscillation, rise of the World Ocean level, sea ice and icebergs.
e) *Biological, biophysical and astrophysical:* insect invasion, fires, meteorite fall.

2. Anthropic hazards:

a) Industrial and related to transports;
b) Wars and nuclear accidents - their effect on society and environment.

In the national legislation, by **disaster** one understands an event caused by the initiation of certain types of risks because of natural or human causes, generating human or material losses or environmental changes and that, by their dimension, intensity and consequences, reaches or exceeds specific levels of seriousness set out by regulations regarding the management of emergency situations issued and approved by Law (Law 481/ 2004).

EMERGENCY SITUATION

It is defined as an exceptional non-military event that, by its amplitude and intensity, threatens people's life and health, the environment, important material and cultural values, while, for resetting normality, it is necessary to take urgent measures and actions, to assign additional resources and to unitarily manage the forces and means involved *(Government Emergency Ordinance - O.U.G. 21/ 2004)*.

Disasters are determined by **risks** as rare and extreme events, occurred in the natural environment or generated by human activity that negatively affects human beings, the environment or the social- economic activity.

RISK

Risk represents the likelihood for a hazardous event to occur, by unfolding with a certain force, in a certain place and in certain a period of time. Risk refers to people and objects exposed to the risk of some natural events to take place.

Figure 1: Concept of Risk

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

Explanations (for figure1): locations and populations in the yellow area are characterized by certain types of vulnerability; those in the red and orange areas are threatened by natural disasters.

In any case, risk might only occur in the orange area, where hazard and vulnerability coexist.

Risk is something that has not yet taken place, something that it is estimated to happen in the future. If a risk is anticipated as very high, then there are 2 possibilities: eliminating the risk or reducing it as much as possible.

In the national legislation, by **risk** one understands the foreseen level of losses, likely to happen, estimated in victims, damaged properties, disturbed economic activities, impact on the environment due to a hazard taking place in a certain area and by referring to a certain time (*Romanian Government Decision – H.G.R. 642/2005).*

VULNERABILITY

Vulnerability represents the level of losses expected by an element or a group of elements (people, structures, goods, services, economic or social capital, etc.) that is exposed to a certain risk, following a disaster or a hazard. Vulnerability is determined on a scale from 0 to 1, or from 0% to 100% (suggested definition in the Internationally agreed glossary of basic terms related to disaster management (*DHA, 1992)).*

Vulnerability can only be identified and studied with references to a certain type of a specific hazard. The vulnerability of a specific type of hazard varies, based on sector and context: for example, in populated areas, vulnerability comes from the low quality of buildings and base infrastructure, in the field of health, it occurs following the lack of medicine supplies and first aid kits, while in the field of economic activities, such as agriculture, it occurs following the shortage of stocks, etc.

In order to ensure a common understanding in the process of *risk element* assessment, one also has to be aware of a series of definitions agreed at the level of the authorities in charge of the management of risks generating emergency situations, such as:

Acceptable risk: It represents the level of potential losses that a society or a community considers endurable, given the specific social, economic, political, cultural, technical and environmental conditions.

Exposure: It is represented by all the people, properties, systems or other elements existing in hazard areas that can bear certain losses. The exposure is variable according to the moment the event takes place, which can generate a different impact.

Impact: It represents the negative effects of a hazard, expressed as impacts on population, as economic and environmental impact, and social and psychological impact.

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

In Romania, **the classification of the types of risks generating emergency situations** is regulated by H.G.R. 557/2016, as follows:

TYPE OF RISK	ASSOCIATED RISK
1. Storms and Snow Storm	Snow storm
	Storms - strong wind and heavy precipitation
	Hail
2. Floods	Floods following a natural overflow of watercourses caused by the increase of flow capacities resulting from precipitation and/ or sudden melting of snow or blockage caused by undersized discharge openings of bridges and footbridges, blockage produced by ice or floating items (waste and wood material), landfalls, alluvium and snow avalanches, as well as floods caused by discharges from mountainsides.
	Floods caused by incidents, accidents or failures in hydro-technical constructions
3. Heavy Snowfalls	Heavy snow
	Blocking of highways and railways
4. Tornadoes	
5. Drought	Hydrologic
	Pedological
6. Extreme Temperatures	Ice build-up, hard rime, early or late frosts
	Glaze ice
	Ice bridges and dams on water (ice dam)
	Heat
7. Vegetation Fires	Fires at the level of forestry area
	Fires at the level of grasslands and/ or scrublands
	Fires at cereal crops
8. Avalanches	
9. Landfalls	
10. Earthquakes	
11. Accidents, Failures, Explosions and Fires in Industry, Including Landfalls Caused by Mine Exploitations or Other Technological Activities	
12. Accidents, Failures, Explosions and Fires in Activities of Transport and Storage of Hazardous Products	Major accidents with site implications
	Major accidents with implications outside the site
	Accidents with hazardous products during transport activities
13. Accidents, Failures, Explosions and Fires in Transport Activities	Terrestrial
	In the air
	Marine
	Road tunnels
	Railway tunnels
	At the subway
	On the cable
14.Accidents, Failures, Accidents or Other Events in Nuclear or Radiological	

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

Activities	
15. Water Pollution	That endangers human life, water environment and major facilities of water supply
	With a major cross-border impact
	Accidental pollutions of watercourses
	Marine pollutions by the coast
	Marine pollutions
16. Collapses related to Constructions, Installations or Facilities	
17. Failure of Public Utilities	Important radio and TV networks
	Important communication and information networks
	Important electricity and gas networks
	Important thermal networks
	Important sewage and used water and rainwater treatment networks
	Break of dams or other incidents leading to flow capacity discharge, endangering human life
18. Falls of Atmosphere and Space Objects	
19. Unexploded or Un-deactivated Ammunition Left from Military Conflicts	
20. Infectious Disease Outbreaks	
21. Epizootic Diseases/Zoonosis	
22. Radiological Risk	
23. Fires	
24. Situations Determined by the Attack of Plant Damaging Bodies	

Flooding represents covering of the land with standing or running water that, by its size and term, can cause human victims and material destructions disturbing the good development of the social and economic activities in the affected area.

Floods represent the most frequent and spread on Earth hazard, with many human life losses and large material losses.

Floods occurred in many countries and their consequences have led to a new approach, considering the increase of the social responsibility, namely the flood risk management; in this approach, the awareness and involvement of human communities play an essential role in avoiding losses of human life and reducing damages.

The international practice has proved that the occurrence of floods cannot be avoided, but they can be managed, while their effects can be reduced by means of a methodical process that leads to a set of measures and actions meant to

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

contribute to diminishing the risk associated with such phenomena. The management of floods is facilitated by the fact that their place of development is predictable and a previous warning is often possible, and it is usually possible to also determine who and what will be affected by floods.

The flood risk management means applying some policies, procedures and practices with the objectives of identifying risks, analysing and assessing them, treating, monitoring and assessing risks in order to reduce them, so that human communities, all citizens, can live, work and satisfy their needs and aspirations in a long term physical and social environment.

Flood risk is characterized by its nature and development likelihood, exposure degree of receivers (number of people and possessions), flood susceptibility of receivers and their value, by default resulting that actions have to be taken on its characteristics, to reduce the risk.

1. The main activities of flood management consist in:

Preventive activities (prevention, protection and preparedness). These actions focus on preventing/ diminishing the potential damages generated by floods through:

- Avoiding the construction of houses and social, cultural and/ or economic facilities in potential floodable areas, by describing in the urbanism documents the data regarding previous flood effects; adjusting future developments to flood risk conditions; promoting some proper practices for using lands and agricultural and forest lands;
- Taking structural protection measures, including in the area of bridges and footbridges;
- Taking non-structural measures (the control of using minor river beds, issuing catchment area plans for reducing flood risk and measure programs; introducing insurance systems, etc.);
- A detailed identification, geographic delimitation of natural flood risk areas in the territorial and administrative division, including these areas in the general urbanism plans and provision in urbanism regulations for specific measures regarding preventing and diminishing the flood risk, developing constructions and using of lands;
- Implementing forecast, warning and alerting systems for flood cases;
- Maintaining existing infrastructures for protection against floods and river beds of watercourses;
- Carrying out works for protection against river beds scouring in the area of existing bridges and footbridges;
- Communicating with people and instructing them on flood risks and their way of acting in case of emergency situations.

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

Activities of operative management (management of emergency situations) that are carried out during flood phenomenon:

- Identifying the possibility for likely high waters and floods to develop;
- Anticipating the evolution and spread of high waters along watercourses;
- Warning authorities and the population about the extent, seriousness and time of floods to occur;
- Organizing and taking response actions of authorities and population for emergency situations;
- (Material, financial, human) resource supply at county level for an operative intervention;
- Activating operational institutions, calling out resources, etc.

Activities carried out after the flood phenomenon:

- Supporting in satisfying immediate needs of the population affected by disaster and returning to a normal life;
- Reconstructing damaged buildings, infrastructures and those belonging to the protection system against floods;
- Revising flood management activities in order to improve the process for an intervention planning so as to be able to face future events in the affected area, as well as in other areas.

2. Setting out defence thresholds

The defence condition generated by floods, hazardous weather phenomena, accidents at hydro-technical constructions and accidental pollutions is initiated when the occurrence of a hazardous phenomenon (exceeding of defence thresholds) is noticed or when the likelihood of occurrence is set out by forecast. The specific measures of defence against floods are:

a) Area warning measures, set out at hydrometric stations and at pluviometry posts located upstream of endangered facilities, according to case, for precipitation, levels or flow capacity;

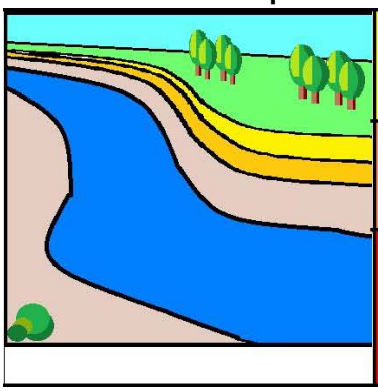
b) Local defence measures, set out close to facilities, as levels or flow capacities.

Warning hydrometric stations and pluviometry posts are part of the national hydrology and meteorology network and must be placed at an adequate distance to the warned facility, in order for the necessary measures, set out by defence plans, to be taken as needed.

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

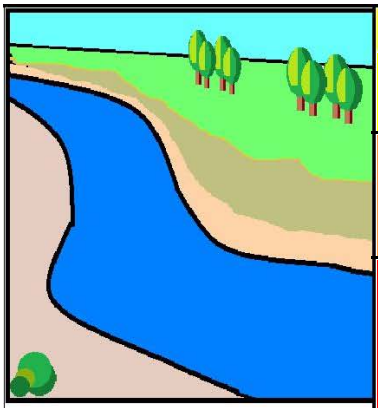
Specific defence measures in case of floods:

A. For dammed up areas of watercourses :



YELLOW CODE	- when the water level reaches the foot of the exterior bank of the dam on a third of its length;
ORANGE CODE	- when the water level reaches half of the height between the level of phase 1 and the level of phase 3 of defence;
RED CODE	- when the water level reaches 0.5 - 1.5 m under the known maximum water levels or under the maximum level for which that dam has been designed or when exceeding a critical point.

B. For areas of watercourses that are not dammed up:



YELLOW CODE	- the level at which the flooding risk is possible after a relative short time, with an increased attention needed in case activities exposed to floods take place ;
ORANGE CODE	- the level at which important overflows take place and they can lead to flooding of houses and social-economic facilities;
RED CODE	- the level at which special measures of evacuating people and possessions, restrictions for using bridges and roads, as well as special measures in exploiting hydro-technical constructions are necessary.

For impoundments, phases I, II and III of defence are set out according to the level of lake water and the affluent flow capacity and are calculated by the engineering designer in the variation between the Normal Retention Level, hereinafter called NNR, and Overflow Top Level.
For dams' behaviour, critical thresholds are set out by the engineering designer for each facility according to:

a) The level of lake water, when it exceeds the overflow top level;
Reaching some limit values in construction behaviour.

Warning threshold - values of some parameters are close to or even exceed the normal called area, without any changes in the general condition of construction stability;

Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access **www.romania-serbia.net**

Alert threshold – hazardous changes of behaviour parameters with an evolution towards starting forms of bending;
Hazard threshold – the dam bears some changes possibly leading to a serious damage or break of the structure.

In case of flood risks by ice aggregation and water overflow, the following specific measures are taken:

- Phase I – when the ice detach and floating ice runs on the watercourse and a small congestion occurs;
- Phase II – when floating ice crowd and water levels grow upstream;
- Phase III – when floating ice is blocked and builds up ice dams leading to damages by overflowing upstream or by moving the floating ice downstream.

Bibliography:

Government Emergency Ordinance No. 21 as of April 15, 2004 regarding the National Emergency Management System;
Law No. 15 as of February 28, 2005 for approving the Government Emergency Ordinance No. 21/2004 regarding the National Emergency Management System
Law No. 481 as of November 8, 2004 regarding civil protection reissued under Art. II of Law No. 212/ 2006;
Decision No. 557 as of August 3, 2016 regarding management of types of risk;
Order No. 192 as of August 2, 2012 for approving the Regulation for managing emergency situations generated by floods, hazardous weather phenomena, and accidents at hydro-technical constructions, accidental pollutions on watercourses and sea pollutions in the coastal area.

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

Topic 2: Preparedness Plan

1. Tasks and responsibilities for managing emergency situations generated by floods, hazardous weather phenomena, accidents at hydro-technical constructions and accidental pollutions

The Ministry of Administration and Internal Affairs fulfils the following tasks:

1.1 Ensuring, by means of its own Ministerial Committee for Emergency Situations, the participation of ministerial structures in fulfilling the support functions according to Government Decision no. 557/ 2016 regarding the management of types of risk;

1.2 Carrying out, by means of the General Inspectorate of Emergency Situations, the following tasks:

a) Monitoring of emergency situations generated by hazardous hydro-meteorological phenomena;
b) Management and coordination of own structures;
c) Centralizing of data and information regarding the effects of hazardous hydro-meteorological phenomena, forces and means participating in the intervention by means of the supervisory control centre of the National Operational Centre or, according to case, the operative group of the General Inspectorate for Emergency situations;
d) Participating in meetings of the Ministerial Committee for Emergency Situations within the Ministry of Environment and Forest as a consultant;
e) Ensuring the exchange of data and information with the Operative Centres of the National Emergency Management System's constituents;
f) Participating in simulation exercises for floods, accidents at hydro-technical constructions and accidental pollutions, organized by the Operative Centre for emergency situations within the Ministry of Environment and Forest according to catchment areas and counties, in order to check the operation of the hydro-meteorological information flow for population's warning – alerting, as well as the way in which local public administration, owners of works with a role of defence against floods and water users know their responsibilities for managing emergency situations generated by specific risks;
g) Coordinating the unfolding of national programs for population preparedness and training of local public administration in the field of defence against hazardous hydro-meteorological phenomena;
h) Guidance, control and coordination of the Inspectorate of Emergency Situations and the Voluntary Emergency Services;
i) Ensuring the unitary implementation, on the entire territory of the country, of measures and actions for preventing and managing emergency situations generated by hazardous hydro-meteorological phenomena.

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

1.3 Ensuring, by means of County/ Bucharest Municipality Inspectorates for Emergency Situations, as follows:

a) Sending forecasts, warnings, notifications and information regarding the unfolding of floods, hazardous weather phenomena and accidental pollutions to the localities likely to be affected and to important social and economic facilities, received from the Operative Centre of the Ministry of Environment and Forest, the Operative Centres of Water Management Systems and Regional Meteorological Centres;

b) Coordinating the development of notification, warning and alerting systems for the population within localities and checking their operational condition;

c) Periodically checking, on the site, together with experts from within the territorial divisions of the National "Romanian Waters" Administration, the way in which the measures for preventing flood risk and for limiting their effects are implemented, at the level of local public administration authorities, public institutions and economic operators;

d) Checking the level of preparedness of management and intervention structures constituted at the level of localities, public institutions and economic operators within risk areas;

e) Drafting population preparedness programs and voluntary and private services, for protection and intervention in case of floods, hazardous weather phenomena, accidents at hydro-technical constructions and accidental pollutions;

f) Periodical training of mayors and local counsellors on their responsibilities of managing emergency situations generated by floods and hazardous weather phenomena;

g) Operative intervention for setting aside the effects of floods, ice on watercourses, accidents at hydro-technical constructions and accidental pollutions, with technical assistance of experts within water management units;

h) Placing at the disposal of Technical Support Groups for managing emergency situations generated by floods, hazardous weather phenomena, accidents at hydro-technical constructions and accidental pollutions led by Water Management Systems, on-line, of operative reports sent by Local Committees for emergency situations and owners of works with a role of defence against floods;

i) Participating in drinkable water supply to the population within localities affected by hydrologic drought or accidental pollutions of water sources;

j) Participating in simulation exercises for floods, accidents at hydro-technical constructions and accidental pollutions, organized every year by the Ministry of Environment and Forest, for checking the way in which the hydrometeorology information flow for population warning and alerting works, the way in which the structures involved in managing emergency situations generated by floods work together, as well as for the training of public administration representatives and population awareness of the risk and the measures to be taken in emergency situations;

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

k) Fulfilling tasks according to Government Decision No. 1593/ 2002 in case of sea pollution with hydrocarbons, by means of Inspectorates for Emergency Situations of Tulcea and Constanta counties.

2. PLAN for defence against floods, ice and accidental pollutions of municipality, city and commune committees for emergency situations

Municipality, city and commune committees for emergency situations issue, with the technical assistance of water management units within the National "Romanian Water" Administration, plans for defence against floods, ice and accidental pollutions on watercourses, with the following content:

a) Mayor's directive for constituting the Local Committee for Emergency Situations;

b) Nominal Constituency of municipality, city or commune Committee, by mentioning the division they belong to, position, (fix and mobile) home and business phone numbers, e-mail addresses;

c) Phone numbers, fax, e-mail addresses of permanent services (town hall, police, etc.) where warnings, forecasts, decisions, directives and information can be sent;

d) Diagram of the operative and decisional information flow for defence against floods and hazardous weather phenomena;

e) List including specific defence data of floodable facilities (.xls type of table, drafted in digital and printed formats), that would cover:

- Number;
- SIRUTA (Information System of Territorial and Administrative Division Register) code;
- Name of villages belonging to the commune;
- Watercourse (all watercourses within the area of the locality – rivers, local rivulets, temporary hollows, streams), existing dam whose damage can lead to locality flooding, areas affected by excessive humidity;
- Name of facilities within the floodable area (for each risk source and for each village in part): no. of houses, no. of social facilities, administrative headquarters, economic facilities, cultural facilities, means of communication, water, gas, electricity networks, phone networks, agricultural lands, forests, protected areas, pollution sources;
- Flooding causes (overflow, discharges from mountainsides, dam failure, excessive humidity);
- Phone numbers, fax, e-mail address of the town hall, police department, school, etc.)
- Location of the local hydrometric station;
- Local defence measures (CA – yellow code; CI – orange code; CP - red code; defence phases at dams, defence phases at ice);
- Location of hydrometric station or warning pluviometry post;

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

- Warning defence measures (CA – yellow code; CI – orange code; CP - red code; critical thresholds at precipitation);
- The time of spread for the high flood wave from the warning hydrometric station to facilities or the average time of hazardous precipitation concentration from the pluviometry post to facilities;
- Hydro-technical works with a role of defence against floods existing on watercourses and in each village (name, owner, technical features, critical points – bank erosions, areas under the designed level, areas with missing protection barriers, areas with crossing works, endemic areas for infiltrations and griffins);
- Likelihood of flooding: standardized (designed), with related and real flow capacity (currently existing, if determined by recent studies);
- Down the page, reference will be made to the significance of specific defence measures and colour codes for hydrologic notifications and warnings;
- The table is signed by the president of the Local Committee for Emergency Situations;

f) Preventive and operative measures to be taken at local level:

- Measures for warning and alerting of population when receiving weather and hydrologic warnings, taken by town halls, police, local committee – responsibilities for turning on warning systems and for population warning in villages belonging to the commune;
- Measures for reaching the WARNING LEVEL (CA), Phase I of defence at dams, Phase I of defence at ice, warning thresholds for precipitation – YELLOW CODE;
- Measures for reaching the FLOOD LEVEL (CI), Phase II of defence at dams, Phase II of defence at ice, worsening thresholds for precipitation – ORANGE CODE;
- Measures for reaching the HAZARD LEVEL (CP), Phase III of defence at dams, Phase III of defence at ice, hazard thresholds for precipitation – RED CODE;
- Measures when exiting the EMERGENCY CONDITION;
- Constituency of the Voluntary Service for Emergency Situations; appointing the Head of the Voluntary Service as flood agent;
- Persons in charge of defence actions (appointing persons responsible for population evacuation and ensuring temporary accommodation places, appointing the personnel ensuring permanent services at the town hall during the unfolding of hazardous hydrometeorology phenomena, appointing the person in charge of issuing daily operative Reports, that are sent to the Operational Centre of the County Inspectorate for Emergency Situations and the Operative Centre of the Water Management System);
- List of bridges and footbridges with undersized discharge openings for which permanent surveillance is ensured during high waters;

g) The table with the minimum stock of existing defence means and materials, whose inventory is decided based on the Framework – Norm, with the technical assistance of water management units, only for necessary types according to the area

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

where the locality is positioned, to the degree of area settlement, to the type of existing works and to the specificity of operative intervention actions;

h) Site plan of the locality, with level curves, including in digital format, at the scale of 1:5,000, 1:10,000 or 1:25,000 according to the plan included in the General Urbanism Plan or as it results from the orthophoto-plans resulted from the flights for agricultural land register), with locating the facilities likely to be affected, marking the floodable areas both from watercourse overflows and discharges from mountainsides, locating the hydro-technical constructions with a defence role against floods with their critical points and indicating areas for controlled flooding (according to case), means of communication, areas with undersized bridges and footbridges and other critical areas, as well as preventive evacuation and accommodation areas for population, animals and possessions;

i) A transversal type profile through river bed and dam (according to case) where DEFENSE LEVELS and Defence Phases at dams will be specified;

j) A report on the status of defence dams in the area of localities that would cover the status of their damage at high floods from the last decade and the way they were recovered;

k) A plan for prevention and fighting against accidental pollution at water sources likely to pollute, own to the territorial and administrative division.

For isolated facilities, such as construction sites, gravel pits, drills and oil storage areas, other facilities likely to pollute – separation ponds, waste storage areas, defence plans will be issued, according to their type, and they will be sent to the Local Committee for Emergency Situations, in the area of which the facility is located. For dams of C and D category impoundments located in the area of the locality, that do not meet the conditions necessary for drafting an action plan, the following will be mentioned: owner, likely floodable facilities in case of accidents at the dam, the person in charge of the technical surveillance on behalf of the Water Management System, data that will be covered by the local defence plan. For localities downstream of the large dams, as they are defined under Art. 1 of Annex No. 7 of ORDER No. 192 as of August 2, 2012, the defence plan against floods will include elements that are strictly necessary, extracted from the action plan in case of an accident at the dam, relevant data from the dam failure study (minimum type of break wave spreading to the locality, the maximum limit of the failure wave – facilities covered by the floodable area, maximum height of the nappe), as well as evacuation routes and areas in case of an accident at the dam. The defence plans of Local Committees for Emergency Situations, issued with the technical assistance and under the coordination of the Water Management System, are checked and confirmed by the County Inspectorate for Emergency Situations and by the Technical Support Group for managing emergency situations generated by floods, hazardous weather phenomena, accidents at hydro-technical constructions and accidental pollutions within the County Committee for Emergency Situations and are approved by the president of the County Committee – county prefect. The maps of the likely floodable

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

areas (flooded during previous high waters) will be displayed at the town hall both on the notice board and by available information means. The defence plan of the Local Committee for Emergency Situations is kept at the town hall office.

Copies of the defence plans of the Local Committee for Emergency Situations are sent by the mayor to the Technical Support Group (Water Management System) and the County Inspectorate for Emergency Situations.

Bibliography:

ORDER No. 192 as of August 2, 2012, for approving the Regulation on managing emergency situations generated by floods, hazardous weather phenomena, accidents in hydro -technical constructions, accidental pollutions on watercourses and sea pollutions in the coastal area;
Mayor's Manual

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access **www.romania-serbia.net**

Topic 3: Preparedness Measures

1. Organization of the Information System

Weather and hydrologic information system consists of noticing, measuring, recording and processing of weather and hydrologic data, issuing forecasts, warnings and alerts, as well as sending them to agents involved in the management of emergency situations generated by specific risks, according to the diagram of the information flow defined in the defence plans, in order to take the necessary decisions and measures.

In the areas laid out with hydro-technical works, the information system also includes data and measures related to the exploitation manoeuvres that have the effect of changing the natural course of discharge.

Any manoeuvre of the hydro-mechanic equipment of the hydro-technical works with a role of defence against floods, belonging to other owners than the National "Romania Waters" Administration, will be carried out only after obtaining the approval and under the coordination of the water supervisory control offices of the Water Administrations.

Delivery of this information is an obligation of the hydro-technical works exploitation bodies, independent of the owner, and takes place in compliance with the information flow diagram, approved through the related defence plans.

The content and significance of the weather and hydrologic warning messages in case of hazardous weather and hydrologic phenomena taking place at national or regional level are decided under Order of the minister of administration and internal affairs and of the minister of environment and water management No. 823/ 1427/ 2006 for approving the procedure for coding weather notifications and warnings and hydrologic warnings and alerts.

Owners of hydro-technical constructions are under the obligation to ensure the installation and exploitation of meteorological, hydrologic or hydrometric devices, with the approval of the Water Administrations, necessary for knowing and tracking the local specific defence measures and ensuring their correspondence to the area measures.

In order to ensure the delivery the information, forecasts and warnings from the meteorological and hydrologic units to Ministry, County and Local Committees and to institutions appointed under norms or operative defence plans, means of telecommunication are set out to be used for this purpose.

Within counties, permanent services will be ensured by the Operational Centres within County/ Bucharest Municipality Inspectorates for Emergency Situations and the Operative Centres within Water Management Systems, while in municipalities, cities and communes, by the mayor, and at endangered social and economic facilities, by their coordinators.

In order to ensure the decisional and operative information flow between County and Local Committees, the means of telecommunication from police

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

departments, military units and other available telecommunication means can be used.

In order to ensure an operative intervention in emergency situations generated by incidents, accidents or damages at dams, the units holding such constructions draft action plans in case of accidents at dams, according to Annex No. 7 under ORDER No. 192 as of August 2, 2012.

In case of accidental pollutions on the Danube and cross-bordering rivers, the information system is organized and operates according the International Operation Manual for Main International Alerting Centre (PIAC), and, in the case of accidental pollutions on internal rivers, the information system is organized according to the alerting system SAPA-ROM and provisions of the county plans for defence against floods, hazardous weather phenomena, accidents at hydro-technical constructions and accidental pollutions.

In case of pollutions with hydrocarbons of the Black Sea, the information system is ensured and operates according to the National Plan for Preparedness, Response and Cooperation in case of sea pollution with hydrocarbons, approved by Government Decision No. 1593/ 2002, with subsequent amendments and additions.

2. Organizing, Preparing and Provision for intervention forces, Means and Materials

Individuals and legal entities who own or use lands or facilities in areas that can be affected by destructive actions of waters or by accidents at hydro-technical constructions are under the obligation to participate in defence actions and to ensure the proper maintenance and exploitation of existing defence works.

Local committees, economic operators who hold facilities that can be affected by floods and hazardous weather phenomena, owners of hydro-technical works, as well as economic operators, likely to pollute, are under the obligation to organize and ensure the defence of such facilities with their own forces and means, previously provided in defence plans, and adjusted to clear conditions that might occur.

Coordinators, individuals and legal entities that own or use lands or facilities in areas that can be affected by destructive actions of waters or accidents at hydro-technical constructions are under the obligations to build up appointed intervention groups, equipped with intervention means and materials according to the Framework - Norm of equipping with means and materials of defence against floods, ice and fighting against accidental pollutions, Annex No. 12 of ORDER No. 192 as of August 2, 2012. In case of Local Committees for Emergency Situations, the activities regarding defence actions and ensuring the proper maintenance and exploitation of existing defence works are carried out by means of Voluntary Services, and in case of economic operators by Private Services for emergency situations.

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

The head of the Voluntary Services for Emergency Situations fulfils the function of flood agent at the level of the territorial and administrative division.

The responsibilities of the flood agent are regulated by Government Decision No. 846/ 2010 for approving the National Strategy for Flood Risk Management on a long and medium term.

Voluntary and Private Services for Emergency Situations will be trained by experts within the County Inspectorate for Emergency Situations and the Technical Support Group for managing emergency situations generated by floods, hazardous weather phenomena, accidents at hydro-technical constructions and accidental pollutions, according to risk categories, for precisely knowing their responsibilities in different emergency situations.

The preparedness and training of Voluntary/ Private Services for Emergency Situations are carried out based on annual and monthly preparedness plans drafted on topics and exercises specific to the risk for floods and accidental pollutions.

County/ Bucharest Municipality Committees for Emergency Situations are under the obligation to constitute intervention forces and means for supporting Local Committees, in case their intervention capacity is exceeded according to law.

County/ Bucharest Municipality Committees for Emergency Situations together with the Ministry Committee will organize simulations for floods, damages at hydro-technical constructions and accidental pollutions on watercourses every year, for checking the way in which the information flow for these types of risks operates, they will develop applicative exercises for checking group's preparedness, operation of warning and alerting systems and the way in which intervention means and materials are used, as well as the training of the personnel involved in managing emergency situations generated by specific types of risk.

3. Operative Intervention Measures in Emergency Situations

The operative intervention measures are taken unitarily, based on plans of defence against floods, ice, accidents at hydro-technical constructions and accidental pollutions that are drafted per counties, localities and by water users likely to pollute, as well as at the level of catchment areas.

In case of forecasting the reach-out of critical thresholds or their untimely reach-out, according to case, the **Local Committees for Emergency Situations** take the following measures:

a) They ensure permanent services in town halls with trained personnel in order to receive notifications, forecasts and hydro-meteorological warnings, decisions of the County/ Bucharest Municipality Committee;

b) They draft and send operative reports according to Annex no. 8 under ORDER No. 192 as of August 2, 2012;

c) They use all existing means for ensuring priority warning and/ or alerting of the population and the facilities located in the areas with risks for floods resulting from watercourse overflows, discharges from mountainsides and accidents at

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

hydro-technical constructions, such as they are marked in local defence plans, as well as the population located in the areas with risks for hazardous weather phenomena and accidental pollutions to take place.

d) They start the operative defence actions in the endangered areas, according to provisions of the approved defence plans, mainly consisting of a permanent surveillance of risk areas; directing intervention forces and means, over increasing and consolidating dams and banks, according to anticipated maximum levels; evacuating population, animals and possessions, according to the Evacuation Plan for Emergency Situations;

e) They take measures to avoid or eliminate a blockage with floating items and ice, especially in the area of bridges and footbridges, water collection points, water discharge from the urban area of the locality.

f) They ensure the participation of Voluntary Services to operative actions performed by experts of the units owning works with a role of defence against floods;

g) They locate overflown waters, as well as those resulting from infiltrations and discharges from mountainsides and direct them to river beds, gravitationally or by pumping;

h) They provide for additional water supply sources to population during critical times.

4. Rehabilitation Measures

After floods, hazardous weather phenomena, hydrologic drought or accidents at hydro-technical constructions and accidental pollutions, in order to reset normality, Local, County/ Bucharest Municipality Committees and specialized economic operators take, according to case, one or more of the following measures:

a) Replacing into operation of the installations for water supply, industrial and domestic waste water discharge that have been affected, as well as discharging waters resulting from floods or standing on agricultural lands, by digging some discharge channels and by installing mobile pumping equipment;

b) Applying the necessary sanitary and epidemic measures;

c) Setting out the physical and value damages caused by floods, hydrologic drought and accidental pollutions and the necessary measures for recovery of the affected objectives;

d) Recovery of the means of communication and of bridges, and water pumping installations;

e) Recovery of the telecommunication and electricity transfer lines;

f) Repairing and placing in operation of damaged or destroyed water, steam, gas, oil pipes;

g) Replacing in operation of affected social and economic facilities;

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

h) Offering support to population in recovery and repair of damages or destroyed personal property facilities;

i) Demolishing of temporary hydro-technical defence works that block the regular development of activities and the recovery of materials that can still be used, the recovery of damaged groundworks, and the repair of damages at hydro-technical works.

The proposals for construction recovery, others than hydro-technical, that are seriously damaged by high waters, are made based on "Protocols regarding the ascertainment and assessment of damages produced following hazardous hydro-meteorological phenomena", issued by mixed committees of experts in the field, appointed based on the prefect's order, according to Annex No. 11 under ORDER No. 192 as of August 2, 2012.

At the end of each time of flood, hydrologic drought, accidents at hydro-technical constructions and accidental pollutions, County/ Bucharest Municipality Committees draft synthesis reports according to the content set out within Annex No. 9 under ORDER No. 192 as of August 2, 2012 for the approval of the Regulation regarding the management of emergency situations generated by floods, hazardous weather phenomena, accidents at hydro-technical constructions, accidental pollutions on watercourses and sea pollutions in the coastal area.

Bibliography:

ORDER No. 192 as of August 2, 2012, for approving the Regulation on managing emergency situations generated by floods, hazardous weather phenomena, accidents in hydro-technical constructions, accidental pollutions on watercourses and sea pollutions in the coastal area; Mayor's Manual

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net

Topic 4: Organization and Implementation of Preparedness Measures (Practical Experience)

Open discussion

Participants shall present practical experience situations

PROGRAM DE COOPERARE TRANSFRONTALIERĂ
România-Serbia
We Invest in Your Future!
Romania – Serbia IPA Cross-Border Program is financed by the European Union, by means of the Instrument for Pre-Accession Assistance (IPA) and co-financed by program's partner states.
For additional information, please access www.romania-serbia.net