GMES Service Element Consolidation

RISK-EOS

(C1)

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1 Introduction

The objective of this document is to describe the policy context and drivers sustaining the RISK-EOS GMES services for natural risks management.

Chapter 2 recalls the political and economic importance of natural disasters in Europe. Losses up to 100 G€ may be caused by a single, long lasting event such as the Elbe floods, which affect regularly the Central European plains. Mudslides caused by heavy rains periodically claims lives and cause considerable damages around the Mediterranean and Alpine regions.

Chapter 3 gives a broad description of the policy sector. The salient feature is that with the exception of the Decision on the common 112-alarm number and the Seveso Directive, no other Community directives exists in the area of civil protection, which remains a competence of the member states.

In chapter 4, a list of European policies is given, including in particular the Community Action Programme, the Community mechanism and the council regulation, and the additional tools such as the European Response Centre and various disaster information systems. These policies and tools have facilitated the convergence of National policies, and can provide the ground for the development of European Directives in the frame of civil protection.

In chapter 5, a sample of National policies is given from five Member States: France, Italy, Spain, Sweden, Germany. It is shown that these national policies have major similarities, which will facilitate the development of common services.

Finally (chapter 6), the needs for geo-spatial information derived from these policies are briefly synthetized.
2 Political and social significance

Increased population density and development of society has brought in many areas an increase of the risks and in the threat imposed by natural hazards. The topic of natural or anthropogenic hazards has certainly come to top of the political agenda and citizens opinion over the last years, due to a series of major events with large effects, such as the repeated floods in Central but also other parts of Europe, the Sarno landslide in Italy and recent earthquakes in the Mediterranean basin.

All European countries (in a geographical meaning) are subject to natural hazards of many different types. These include forest fires, floods, avalanches, landslides, mudslides, earthquakes, volcanic eruptions, storms etc.

Some reinsurance companies, in particular Munich Re, have carried out analyses which show an increase of the number of such events, and certainly an increase in human, economic and environmental losses. According to the French Ministry of Ecology and Sustainable Development (January 2002), from 1997 to 2001 the most costly disasters in the world were:

- The 1999 Turkish earthquakes (22 G€)
- The December 1999 storms in France, Germany and Switzerland (over 18 G€)
- The September 1998 George hurricane in the Caribbean islands and USA (11 G€)
- The September 1999 Floyd hurricane in the Caribbean, Bahamas islands and USA (8 G€)
- The August 1998 Central European floods (6G€)

Floods remain the most common natural hazard in Europe, and the one having highest economical impact.

As an example around 10,000 of the 37,000 French municipalities are prone to floods. The cost of the 2001 floods in UK was reported as 1.5 G€. The economic losses due to the “millennium flood” on the Elbe, Danube, Vltava rivers, that hit Germany, Austria, the Czech Republic and Slovakia in August 2002, were evaluated to 100 G€; it also caused 37 fatalities (tens of thousands houses flooded). The economic losses due to the flash flood events which took place in the South-East of France in September 2002 are evaluated between 1 and 2 G€ Euros.

The diagrams below show an increase of the number of floods over the last 25 years along with figures of human losses caused by floods. The peak in 1998 is caused by the Oder floods.
Forest fires have a considerable impact on forest in the Mediterranean region: losses due to the 1990 fires in Piemont and Lombardy were evaluated to 775 M€, while the 1998 fires and heat wave in Greece caused 600M€ damages and 14 fatalities. Occasionally they may affect other areas, such as the forest fires in Lower Saxony which caused 5 fatalities and cost 13 M€.

Around 80 % of forest fire outbreaks of the European Union are registered in the Mediterranean countries where the corresponding burned surface is more than 80 % of the total forest surface burned in Europe. During the period 1991-2000 Spain has been the most affected country with a total burned surface around 1435000 ha, followed by Italy with 998000 ha, Portugal with 795000 ha, Greece with 577000 ha and France with 181000 ha.
The above graphs show that the number of fire outbreaks has a moderately increasing trend while the burned surface per fire has a moderately decreasing one but maintaining high yearly rates of burned areas. Nevertheless there are some years where the tendency is broken; this is due to the adverse weather conditions during the fire season, for instance 1994 in Spain and 2000 in Greece, Italy and Portugal where the burned surface and number of fires are upped.

The statistical analysis of forest fires reveals a large and continuous effort devoted to pre-suppression and extinction activities. A good example is the case of Greece, that from 1998 has committed a large effort and budget that is made evident in 1999 results, where the total burned area fell to the lowest level since 1976. However, this trend is not kept for 2000 season due to extremely bad weather conditions throughout Europe, and especially in Greece. This fact underlines that forest fire problem needs continuous dedication and effort.

The main reasons for forest fire ignitions in the Mediterranean EU countries are related to the new population distribution in the agricultural land areas and also to the new habits of this population that has abandoned the use of forest by-products for heating, while maintaining the use of fires for agricultural or pasture work. In addition the absence of cattle grazing has affected the fuels accumulation and therefore fire susceptibility.
In general terms, the number of fires in Europe has been increasing over the last years, while the average burnt surface per fire is decreasing thanks to the increasingly efficient operations of the fire fighters in Europe. The trend is toward a decrease of the total burnt surface. However, large fires persist producing extensive damages. Better detection and monitoring tools will help fire fighters to reduce further the number of impacts of these large fires.

Economical losses are always estimated according to different criteria, and the economical damage strongly depends on the country. In the case of Europe the wildfire problem is mostly related to the preservation of an environment of great value to human development and welfare, in contrast with direct products value as timber and other.

The following table summarizes the figures of burnt areas for 2002 in the countries most affected by forest fires.

<table>
<thead>
<tr>
<th>Country</th>
<th>2002 burnt areas (ha)</th>
<th>Mean 1992-2001 (ha)</th>
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</thead>
<tbody>
<tr>
<td>France</td>
<td>20,800</td>
<td>20,150</td>
</tr>
<tr>
<td>Spain</td>
<td>40,000</td>
<td>130,000</td>
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<tr>
<td>Greece</td>
<td>7,000</td>
<td>47,000</td>
</tr>
<tr>
<td>Italy</td>
<td>41,000</td>
<td>102,000</td>
</tr>
<tr>
<td>Portugal</td>
<td>100,000</td>
<td>104,000</td>
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</table>

2002 has been an exceptional year due to very specific meteorological conditions. On the contrary 2003 will remain as a catastrophic year in many Southern Europe countries. For instance, more than 400 000 hectares were burnt in Portugal.
3 Overall policy scenery

3.1 A policy approach based on subsidiarity

Civil protection and disaster management policies are closely linked to the territory and its economic, geographical, geophysical and climatic dimensions. This approach is echoed in the subsidiarity principle of the Treaty of the European Union. It has therefore to be noted that while Civil Protection – understood in a broad sense – falls under the first pillar, it remains a responsibility of Member States in Europe: there is no «Community or European Civil Protection» and therefore no single «European civil protection policy» which would apply throughout Europe.

Even in the related field of environment, tasks related to civil protection are not driven mainly by European directives, despite the existence of the Water Directive, or a proposed legislation on soil protection. There is currently no common EU strategy for flood prevention. The objective of the Framework Directive in the field of water policy is to establish a Community framework for the protection of inland surface waters, transitional waters, coastal waters and groundwater, in order to prevent and reduce pollution, promote sustainable water use, protect the aquatic environment, improve the status of aquatic ecosystems and mitigate the effects of floods and droughts.

Exceptions are the Decision on the common 112-alarm number and the Seveso II Directive 96/82/EC containing provision on hazardous industrial sites inventories and obligations for having emergency plans and information to public. This directive will not be analysed in the document due to its very specific scope, which is falling outside the scope of the project.

The present situation is likely to be maintained as the draft European Constitution (article I-16) explicitly states that Civil Protection is one of the domains where “the Union may conduct supporting, coordination or complementary actions”, as opposed to an area of exclusive or shared competencies. Para 3. of the same article even specifies that mandatory juridical acts cannot include harmonisation of the Members States’ regulations in these matters.

This does not imply absence of a European dimension of disaster management:

1. Cooperation amongst European civil protection organisations is becoming an increasing reality, dictated by factors such as budget shortage (see for instance pooling of expensive Canadair waterbomber resources), large events effecting more than one country or requiring assistance with external resources (1999 storms in France) and complexity of risks and threats (Community exercise on biological attack)

2. Set up of specific Community policies such as the Cooperation mechanism on Civil Protection and the Community assistance fund set up after the 2002 Central European floods

3. Even though the development of Member States' policies and organisation has depended heavily on national political structure, history etc., one may witness a large similarity of
functions and practices in Europe. There is a European way of managing risks, which has differences from a Russian or American one.

3.2 A “European way” of managing risks

In Europe, risk management is characterized by four main lines of activities: prevention, prevision, crisis and post crisis management.

The prevention phase corresponds to the long term planning elaboration. This is the phase when the risks are defined and mapped (flood prone areas, high level fire risk areas…). This risk mapping and risk prevention planning is prescribed as a legal obligation in most European Member States. This comes with regulations on land planning, aiming to avoid development of habitat or sensitive infrastructures in the areas most subject to hazards. In addition, structural actions such as fuel management (to reduce the fire risk), draining basin management (to reduce the flood risk) are undertaken. Environmental and structural data mapping is needed by the involved institutions and organisations in order to elaborate the required risk mapping.

The prevision phase corresponds to the daily planning for risk and vulnerability mitigation, and the anticipation of possible events. It takes into account daily risk index maps (fire risk) based on the daily meteorological data and additional daily parameters (vegetation water content, soil water content…) allowing the resources allocation refinement; flood risk is anticipated by use of river monitoring systems and forecasting tools.

The risk anticipation capability is a major driver to disasters consequences mitigation. Therefore all Member States have set-up organisations mandated to provide the appropriate services. The recent French law on the organization of Flood Prevention and Forecasting, which transformed the “Flood Alert Centers” into “Flood Forecasting Centers”, is a good example showing the increasing importance given to the issue.

The crisis phase begins as soon as an event (flood or forest fire) occurs. At this level, all organisations involved in the crisis management are activated. In this phase, the early detection is essential for the initial event management, and various systems and organisations are used among the European countries. Then, the event monitoring is often realized by radio contact (when communication networks have not suffered damages) from the field to the operational centres, and when possible by helicopter. In some countries, the GPS technique begins to be used for monitoring the position of the ground resources.

The post-crisis management is mainly devoted to the damage evaluation and the rehabilitation of the affected areas. The mapping of the damages is essential for an efficient experience feedback allowing the prevention improvement, of which the information of the citizens is an intrinsic and important part. This is done today by different means (field surveys, …), but space-based observation can obviously play a more important role in it.
3.3 Policy shifts

Changes in policy are very often observed after large-scale events, which give rise to parliamentary actions such as inquiry committees or commissions. One may quote the Dauge report, or the Parliamentary commission report on Somme floods in France, the Oder flood commission, the Sachsen-Anhalt working party in Germany or the Sarno commission in Italy. Similarly, the European structural fund was set up after the 2002 Central European floods.

Since these large-scale or highly visible events are critical to the policy process, it is essential to provide relevant information and services covering them, even though the contribution of these events to the overall balance is not necessarily the major one. While the Somme floods have had a limited impact in terms of loss of life, they have significantly influenced the opinion. Conversely, the Vaison-la-Romaine flood had triggered the action of public authorities towards fast floods.

Overall laws tend to change relatively slowly (pace of a decade rather than a year). A shift in policies may be witnessed throughout Europe with a special attention to introducing more holistic policies and improvement of the prevention measures in respect to both technological risks and natural disasters.

In recent years, there is an increasing trend to investigate the origin of forest fires in Central and Mediterranean Arcs. Knowledge of the origin of European fires allows, on one hand, the optimisation of the activities deployed to prevent them, particularly dissuasive surveillance, preventive forest management, and fire suppression command and control. On the other hand, it is a tool to forecast the future incidence of this phenomenon in view of understanding future needs.

In the wake of the terrible floods that devastated parts of Germany, Austria, the Czech Republic and Slovakia, the European Commission set up an aid fund of between €500 million and €1 billion to be used in the event of natural, technological or environmental disasters. It has also confirmed that a raft of measures covering different fields, including the Structural Funds, will be implemented.

The creation of the European Union Solidarity Fund at the end of 2002 has been a very important step to assist affected regions in the event of major disaster. Nevertheless, French and Netherlands delegations have stressed the fact that there was a need for action in the field of prevention and interregional and international cooperation. The topics tabled for discussion were the establishment of an international network of thematic centres floods, the need for an instrument at EU level (directive, annex to the Water framework Directive, recommendation, guidance document, …).

During the meeting of 13 June 2003, the Council took note of written information from the French and Dutch Delegations on flood prevention. Both delegations considered that action at Union level needed to be reinforced in this area, as the frequency and violence of this phenomenon have shown a tendency to increase in most of Europe, putting a number of countries at risk. They asked the Commission to continue its efforts in this field and to strengthen its initiatives at Union level.
In the area of risks anticipation, one shall mention the EMMA on-going project which aims to define and implement a common European service for delivering to all European citizens a common information for “awareness” to meteorological risks, similarly as the “meteorological vigilance” delivered daily in France by Meteo-France. This might be a “precursor” to the definition of harmonised services dedicated to “risk awareness”.

Lastly, the INSPIRE (Infrastructure for Spatial Information in Europe) initiative was recently launched by the European Commission and developed in collaboration with Member States and accession countries. It aims at making available relevant, harmonised and quality geographic information to support formulation, implementation, monitoring and evaluation of Community policies with a territorial dimension or impact. This a legal initiative of the EU that will address technical standards and protocols, organisational and co-ordination issues, data policy issues including data access and the creation and maintenance of spatial information. It will initially focus on spatial information needed for environmental policies. Since it will have an impact on all geographical information, it will also impact the emergency, prevention, damage assessment policies which need such information to be implemented.
4 European policy

The strategy adopted by the European Commission is concentrated on the prevention, the crisis preparedness and the reaction capacity. This combination of prevention, action and rehabilitation measures should allow the mitigation of the environmental damages and of the citizen exposure to risk.

As stated above, the domain risks management is mainly placed under the principle of subsidiarity. The action of the European Commission is concentrated on:
- financial support, for instance in case of major disasters such as the Oder flood
- recommendations for the adoption of national and regional prevention plans
- set-up of a European-level organization for information exchange and cooperation between responsible authorities of the Member states civil protection
- specific directives

Other supra-National initiatives or organizations (eg: International River Commissions) are also mentioned in this chapter.

4.1 Community action programme in the field of civil protection (Council Decision 1999/847/EC)

This is the primary place for Community action in the field of civil protection and information to the Public. The objective is to support the Member States in preventing risks and damage to persons, the environment and property in the event of natural and technological disasters.

The programme has five main objectives:

- preventing risks and damage to persons, the environment and property in the event of natural and technological disasters;
- increasing the degree of preparedness of those involved in civil protection in the Member States;
- detecting and studying causes of disasters;
- improving methods of response and rehabilitation after emergencies;
- public information, education and awareness.

The Community Action Programme in the field of civil protection foresees different types of cooperative actions including: major projects of general interest, training (workshops, exchange of experts, exercises, …), and other actions including pilot projects.
4.2 Community mechanism on reinforced civil protection cooperation

4.2.1 Council decision 2001/792/EC

This decision is intended to improve coordination of civil protection assistance intervention in major emergencies. Such cases may arise from a natural, technological, radiological or environmental disaster, including accidental marine pollution, occurring inside or outside the European Union.

This mechanism consists of a number of elements and actions including:

- compiling an inventory of assistance and intervention teams available in the Member States;
- establishing a training programme for members of such teams;
- launching workshops, seminars and pilot projects on the main aspects of interventions;
- setting up assessment and coordination teams;
- establishing a monitoring and information centre and a common communication and information system.

In order to establish this mechanism, Member States must take the following steps:

- identify the teams available for intervention within 12 hours following a request for assistance;
- select experts who can be called upon to take part in an assessment or coordination team;
- provide all relevant information for setting up the mechanism, not later than six months after the adoption of this decision;
- designate the competent authorities and contact points for implementing the decision and inform the Commission accordingly.

4.2.2 The Response Centre of European Commission

The EU Response Centre has been active since January 2002 and operates on a permanent basis 24 hours a day. It co-ordinates the assistance offered by the participating countries in case of natural or man-made disasters inside and outside the EU. This response centre is the key element of the Community Civil Protection Co-operation Mechanism, established under Council Decision of 23 October 2001 and in force since 1 January 2002. This instrument provides a new challenge in the field of Civil Protection in Europe. This is a small structure within the Civil Protection Unit whose basic function is to collect and disseminate information and to mobilise expertise from the national administrations. It is ready, at the request of a Member State for example, to relay a message to the other Member States; or, in response to a request, to seek out and mobilise expert advice.

The Rapid Response Centre was active for example during the floods in Central Europe in August 2002 and the Prestige accident in November 2002. Participants in this mechanism are the 15 Member States, the three EEA countries and eleven accession countries that have signed a Memorandum of Understanding. Thus about 480 million Europeans are covered.
4.3 Council Regulation for the protection of forests against fire

The Community (European parliament and council) works on the forest protection against the atmospheric pollution and against the forest fires. The Union wants to continue the development of the forest survey by integration those regulations in a new action named Forest Focus.

This proposal (Forest Focus) aims to establish a new Community scheme to assess forest ecosystem conditions in a broader context. It builds upon, and regroups elements of, two previous Council Regulations (which ended on 31st December 2002) for monitoring the impacts of atmospheric pollution and of fires on forest ecosystems.

The proposed scheme is based on the following four pillars:

- establishment of a monitoring programme on air pollution effects;
- establishment of forest fire monitoring;
- ongoing evaluation of monitoring efficiency;
- establishment of new monitoring activities on forest biodiversity, soils, climate change and carbon sequestration.

4.3.1 A coherent forest fire information system in Europe

Although the risk of forest fire is influenced by many different factors that fluctuate in a wide time and space scale, the calculation of fire risks was until recently performed at a local level. In response to the problem, the European Commission (EC) developed a coherent forest fire information system for Europe. DG Environment and the Joint Research Centre (JRC) have established the European Forest Information System (EFFIS), with the aim of providing a pan-European approach to the evaluation of long-term and short-term forest fire risks, as well as in the evaluation of forest fire damage.

EFFIS uses special indices for the evaluation of the fire risk, among them the Fire Potential Index (FPI) that takes into account differences between regions, dynamic variables such as the vegetation's relative greenness, hydric stress, meteorological conditions, as well as fairly static factors, such as the forest vegetation type. The fire risk forecast maps computed by EFFIS are distributed every morning via Internet to the civil protection and forest fire services in the Member States, as well as to the Civil Protection services of DG Environment. These maps constitute an additional source of information for the Member States and are essential to reinforce international collaboration during forest fire fighting campaigns.

All information on forest fire risk forecast provided to the Member States is available to any interested body through the Internet site of the European Forest Fire Information System (EFFIS).

4.3.2 European Forest Fire Damage Assessment System (EFFDAS).

The forest fire information available at the European level is normally aggregated at administrative level and ignores the exact spatial location of fires. Furthermore, each country has its own methodology to assess burned areas, which leads to a lack of harmonization of the burned area statistics. There is also a large time delay between the end of the fire season and the processing and availability of the forest fire statistics, both at national and European level. This can hinder any type of spatial planning regarding the forest areas affected by fire. It can as well hold back any measures...
that could be necessary to prevent major soil losses, and other natural hazards that could derive from unprotected soil such as autumn or winter floods. In this context, the use of remotely sensed data is most adequate for providing fairly accurate statistics on burned area location and extent shortly after the fire season.

The recent events occurred in southern Europe where a number of exceptional large uncontrolled fires destroyed an important part of the land resources have lead the JRC to activate the European Forest Fires Damage Assessment System (EFFDAS) before the end of the fire season. The system has been activated for Portugal, France, Greece and Spain. The work is realised under the Forest Fire activity of the Natural Hazards Project (Institute for Environment and Sustainability - European Commission Joint Research Centre). The objectives of the Forest Fires component of the project is to map burnt areas, to assess forest fire damage. This is achieved by integrating information derived from Earth Observation data as well as ancillary data.

### 4.4 Community response to the flooding in central Europe

After the flooding in Central Europe that devastated parts of Germany, Austria, the Czech Republic and Slovakia, the European Commission set up an aid fund of between €500 million and €1 billion to be used in the event of natural, technological or environmental disasters. It has also confirmed that a raft of measures covering different fields, including the Structural Funds, will be implemented.

The objective is to draw up a list of the array of measures that can be taken directly and in the future, in particular the creation of an EU Disaster Relief Fund, to come to the aid of the Member States and applicant countries whose citizens suffer as a result of natural disasters in general and flooding in particular.

### 4.5 Call for proposals in the field of Community co-operation as regards Civil Protection

The aim of this call for proposals is to identify activities, which might be eligible for financial support from Directorate-General Environment in the field of Community co-operation as regards civil protection. This support would take the form of co financing grants.

The purpose is to support and supplement the efforts being made by Member States at national, regional and local levels, for the protection of persons, property and, in so doing, the environment, in the event of natural or technological disasters, without prejudice to the internal division of competence in Member States.
4.6 Multi-lateral cooperation

4.6.1 International River Commissions

For several transborder rivers such as Rhine, Mosel, Meuse, Saar, Elbe, Oder “International Commissions” have been set-up by the competent Ministries of the relevant border states, and charged to set up and manage coordinated action plans for flood prevention.

For instance the ICPMS (Moselle and Saar protection) elaborated in 1997 a joint action plan focussed on three axes: reducing the risk of damages, improving the flood forecasting systems, improving the water retention capacity within the watershed. The detailed measures of this action plan show many requirements for geo-spatial monitoring (e.g.: monitoring the “damage potential”, improving forecasting models, inventory water bodies, preserving flood expansion fields, etc.)

It has to be noted that, practically the implementation, of such measures is done locally by those organisations already responsible of implementing national policies. Therefore these Commissions, rather than defining a supra national policy, provide a vehicle to ensure that coherent policies are implemented in a single river basin.

Current flood prevention measures for the major trans-boundary river basins in Central and Western Europe are based on flood action plans for the entire catchment’s area. The first such action plan was drawn up by the International Commission for the Protection of the Rhine in January 1998. There are also similar plans for the Meuse, Mosel, Saar and the Oder. The actions plans for the Elbe and the Danube are still incomplete.

4.6.2 EUROBALTIC Civil Protection Programme

Within the framework of the Council of Baltic Sea States (CBSS) a EUROBALTIC Civil Protection Programme is established. Some of the cooperation is conducted within an INTERREG III B Project with the Swedish Rescue Services Agency as Lead Partner. The project is described as follows in the application:

Sustainable development is endangered by societies becoming increasingly vulnerable to different natural, man-made or technological and environmental risks and disasters, or their combination. The increasing number of natural disasters, i.a. the recent devastating floods in Europe, the risks for serious accidents in production, storage and transport of chemicals, terrorism-related and other threats to society endanger positive economic, social, health-related and environmental developments in the Baltic Sea region. There is serious and urgent need to improve the mechanisms and institutions to deal with these threats, which endanger both safety of citizens and basic functions of societies.

Many of the safety issues require to be tackled through international cooperation and transnational solutions as well as common policies between several sectors of society. The problems are to a great extent by nature horizontal in respect to safety, health and environment, and a common
approach needs to be developed to avoid overlaps, unclear responsibilities and uncoordinated action. An important factor regarding the implementation of sustainable development is to achieve social mobilisation (civil societies, enterprises, academic institutions) and to support the increasing interest demonstrated by regional/local administrations in preventing and mitigating risks by introducing the safety dimension in their spatial, physical and Civil Protection planning. Balance is needed between top-down and bottom-up approaches involving the regional/local level where the main responsibility for creating safe societies lies. Networks must be created to improve abilities in protecting human life and the environment and cultural heritage and promote sustainable development of safe communities. The project will support development of safe communities by improving abilities in protecting human life and the environment, both natural and physical, as well as the cultural heritage and certain uniquely fragile ecosystems in the Baltic Sea Region. The project will promote safe industrial development and cooperation on spatial planning and sustainable land use management, thereby contributing to creating safe communities in the region and mitigating the risks for cross border effects of disasters.

When considering the obstacles to the successful implementation of risk prevention and mitigation strategies, emphasis will be given on the lessons learned from accidents and efforts made to reduce natural and technological disasters or their combination, namely complex disasters. The project will strengthen transnational, cross-sectoral and multi-level cooperation to increase safety of the population, protection of the environment and sustainable development in countries and societies adjacent to the Baltic Sea.

Partnerships and mutually advantageous interaction among the Baltic Sea States and the European Commission are to be established with the purpose of promoting Civil Protection within central, regional and local public administration, institutions and enterprises.

The INTERREG activities are organised in SWEDEN/ Stockholm, Karlstad, Karlskoga, East Blekinge, Töreboda, Skövde, Arboga and County of Värmland; FINLAND/Helsinki, Porvoo, Kouvola, Pori; DENMARK/Tinglev; NORWAY/Oslo. The project aims at creating networks among and involving actively regional and local authorities, organisations and industry.

Additionally, the project will fully follow the Northern Dimension policy by covering Estonia, Latvia, Lithuania, Poland, and North West Region/St. Petersburg and the Kaliningrad oblast of the Russian Federation with separate PHARE and TACIS funding, building also on existing

### 4.6.3 Workshop on extreme floods and dam safety

The workshop, held on the 28 April 2003 in Helsinki, was attended by representatives of the following countries: Estonia, Finland, Georgia, Germany, Hungary, Italy, Netherlands, Norway, Poland, Republic of Moldova, Slovakia, Sweden and Switzerland.

The main conclusion of the Workshop have been the following:
The vulnerability to extreme events is increasing due to climate change, environmental impacts of land-use modification, the construction of large infrastructures, improved watercourse navigability, etc. The lack of information and the uncertainty still surrounding climate change effects forecasting are a further obstacle.

Every flood event is unique and therefore the preventive and protective methods should be suited to the situation; structural and non-structural measures should be used according to the conditions. Measures applicable to plain areas, such as the use of flood plains, are not adequate for mountainous areas.

Cooperation is extremely important. Flood prevention and management programmes can be developed only on a river basin scale and close cooperation is needed between upstream and downstream countries.

There is a need for a sound scientific approach to forecasting and decision-making. Tools to organize and transmit the information to decision makers and the public, such as simulation programmes and GIS (flood risk mapping), are extremely useful.

Early warning systems are very important, especially in the event of flash floods.

However, the effectiveness of these systems depends heavily on the level of information and training of the population. An aware and informed population reacts better. There is therefore a need to design ways and means to educate the population, and at the same time to learn from its experience. The role of the mass media, especially local mass media, in this respect is very important; they should become a partner in this task. At the same time, the mass media often lack scientific expertise on the issue and should be provided with tailored information. Other channels, from the traditional ones, such as schools, to modern means of communications, such as the Internet, should also be used.
5 National policies

A basic principle in both prevention and emergency management is that the response must be taken at the appropriate hierarchical and geographical level, starting from the citizen through the municipality, and only in very important or serious emergency situations on the state level. Therefore responsibilities are very often delegated top-down from the state level to the regional, provincial or municipality level.

We here below describe the National policies of France, Italy, Spain, Sweden, and Germany.

5.1 France

5.1.1 Forest fire prevention policy

The forest fire prevention policy has been set up by the Ministry of agriculture, the ministry of the Interior, territorial communities and forest owners. This policy contains four types of actions:

- **To know the risk and the fire causes**
  Set up of strengthened meteorological observation networks by the regular evaluation of fuel moisture content. Researches are conducted in order to identify the fire causes, allowing a daily prevention and fighting means deployment more efficient
- **To keep watch on the forest in order to detect any fire start**
  During the high fire risk season, the forest observation combines ground fixed lookout, or mobile with different kind of patrols
- **To supervise the forest fire equipment**
  Protection plans integrate prevention management (sylviculture, agriculture, clearing) and sometimes high-tech surveillance equipment. They are completed by a cartography system.
- **To inform and increase the public awareness**
  - Education in the academic environment
  - professional training
  - information to the public (vacationers, land owners, …)
  - information exchange between the whole actors concerned by the forest fires.

Three different Ministries are concerned with the forest fire management activities:

- Ministry of the Interior through the French Civil Security: the DDSC is in charge of the prevention part in collaboration with the Ministry of Agriculture and of the operational part through several operational centres
- Ministry of Agriculture which is in charge of the prevention and forest management.
- Ministry of Ecology and Sustainable Development : participates in the rural area and forest management policy
5.1.2 Flood and Fire Prevention Plans - Law n° 95-101 2 February 1995

The Prevention Plans aim to delimitate the risk-prone areas (fire, flood, landslide, avalanches…) delimitation and to prescribe the prevention measures – in particular in terms of land use limitations. Prevention Plans are a legally prescribed obligation but the process is not achieved: today, 3369 municipalities only are covered by an approved Prevention Plan.

The PPRI (Flood Prevention Plan) is made of (1) a cartography and (2) regulations. It defines a number of classes according to risk and the territory is divided into these classes; different regulations regarding land use apply to these classes. The reference event is the century flood. A preliminary document is often prepared prior to this regulatory document: the atlas of flood-prone areas (based on historical experience or hydrological studies). In France, there are 160 000 km of waterways and one municipality out of three is considered as being in flood prone area.

Similarly the PPRIF (Forest fire prevention plan) defines the risk level and implied safety rules and obligations to the new buildings for example. This document requires the elaboration of maps where risk indexes are reported. Different methodologies are used for this plan elaboration (fire propagation modelling, indicial methods…).

For both risks (flood and forest fire), a departmental map at the 1/100 000 scale, defining the high, medium and low risk, has to be realized. In the high risk areas, where anthropic or industrial factors are present, the map should be at the 1/25 000 scale. This plan elaboration requires environmental parameters as input data. The EO technology could be used for those data production and for their yearly up-dating.

Law n°2003-699 30 July 2003 on technological and natural risk prevention

This law brings modification to the environment code stipulating related to prevention plan concerning foreseeable natural risks as floods, forest fires. The objective of those prevention plans is:

- Risk prone area delimitation in order to prohibit new construction
- Vulnerability area
- Define prevention and protection measures;
- Management measures in the previous areas

5.1.3 Flood forecasting – Law of Feb 21, 2003

This new law introduces important changes to the former legislation:

- A new objective: move from “flood announcement” to “flood forecasting”
- A reorganisation of the Flood Forecasting Centers,
- The creation, since June 2003, of the SCHAPI (Central Hydrological Service for Support to Flood Forecasting), with the aim to deliver in complement to the forecasts produced by the local forecasting Centers, a “flood awareness map” dedicated to the Civil Protection services, Regional authorities, and citizens.
- A master plan for flood prevision is defined for each draining basin.
These services may operate in complement to the services set up by local governments for their own information.

5.1.4 Mapping of burnt areas

The burnt area mapping is requested by the Prefect the day after the fire:

- For public information purposes
- For erosion and landslide prone area evaluation
- For the knowledge of the burned land use

At present, the burnt area mapping is mainly done by GPS technique. This year, a study has been initiated in the frame of the PAREFEU project, in the Var Department, in order to map burned areas using SPOT5 images analysis.

5.1.5 State declaration of natural disaster, 1985.

Financial assistance in case of disaster is provided though a special mandatory insurance premium added to all insurance contracts, which feeds a dedicated fund. This fund will be used whenever extraordinary conditions are met, or when the « state of natural disaster » is declared for a specific municipality.

Evidences of the exceptional nature of the event are examined by a dedicated commission. For floods for instance precipitation measurements reported by the meteorological services are matched against predefined thresholds.

This mechanism is quite unique to France. In many other countries this issue is left to the private insurance market. In exceptional circumstances, such as the Foligno earthquake in Italy or the Elbe and Danube floods, national governments set up a special indemnity fund. After these floods such a fund has been set up at European level.

5.1.6 Public information

Information of the citizens on their exposure to risks is ensured by the availability of the flood risk atlas – gathering in particular the available information on past natural hazards – in each municipality city hall.
5.2 Italy

5.2.1 Overall organisation

The Italian organisation is structured in three levels.

The central administration (mainly referred to the Civil Protection Department) is in charge of the following responsibilities:

- the promotion and coordination of civil protection activities of the national and local administrations
- the definition of guidelines for the prediction, prevention and emergency activities, of any hypothetical risk condition
- the definition, in cooperation with the local administrations of the emergency plans in case of large disaster emergencies
- the technical aid and the aerial means for the extinguishment of forest fires.

The regional authorities shall:

- provide the prediction and prevention plans according to the national guidelines
- supply the proper intervention in case of a disaster events (possibly, exploiting the Firemen National Corp), which cannot be managed by the provincial authorities.
- provide the guidelines for the provincial emergency plans
- manage the forest fires fighting activities
- coordinate the organization and exploitation of the voluntary associations

The provincial administrations receive and implement the regional directives; they shall:

- actuate, at the provincial level, the regional plans for the risk prediction and prevention.
- define the provincial emergency plan according to the regional recommendations

5.2.2 Forest fire management

Law November 21, 2000

This Law sets out the principles governing fire-fighting activities aimed at the protection and conservation of forests.

Within this legislative framework, the Regions must in particular approve the programmes related to fire-predicting, fire-preventing and fire-fighting activities, without any prejudice to the guidelines and directives adopted by the Government. Said regional programmes shall define, among others, the forest areas at risk, the risk levels per area, the forest areas affected by fires during the previous year. Ground and aerial fire-fighting equipment shall be used to fight fires. The Government and the Regions must jointly contribute to the development of formative as well as informative activities.
Article 3 of Act No. 353 of 2000 on forest fires requires the Regions (and the Autonomous Provinces) to draw up and approve their own plans on the activities to be performed in order to forecast, prevent and combat forest fires. This Decree establishes the guidelines to be followed by the regional authorities when elaborating and approving such plans. Point 2 of the Decree lays down the layout of the plans. The following items shall be addressed: (I) general framework containing a territorial description along with cartographies and making provision in matter of databases; (II) forecast of forest fires, taking into account the factors that may cause fire-breaks; (III) prevention of forest fires through special actions and initiatives, including dissemination of information and raising of awareness; (IV) fight against forest fires (surveillance, watch-posts, human resources); (V) regional protected nature areas and reserves; (VI) national parks; (VII) funding of the activities covered by the plan.

Decree from 20 December 2001 "Linee guida relative ai piani regionali per la programmazione delle attivita' di previsione, prevenzione e lotta attiva contro gli incendi boschivi"

This law is mainly concerned with hazardous agricultural methods and unauthorised building or soil use. The law stipulates that the usage of burnt areas cannot be changed for at least 10 years. It is also one of the very few policies in which the use of satellite observation is explicitly mentioned.

5.2.3 Flood management

Different organisations play fundamental roles for Flood Risk Management in the various Risk Phases. The tasks of Servizio Idrografico e Mareografico [hydrographic and tide gauging service] include that of detecting and publishing climatic, hydrological, and hydrographic measurements (surface and underground outflow, sources, and solid transport) affecting the surface water network, for the purpose of land defence and use of water resources. The hydrographic service is divided to 10 local departments (Venezia, Parma, Genova, Bologna, Pisa, Roma, Pescara, Napoli, Bari, Catanzaro, Palermo, Cagliari).

The measurement station network -that is the monitoring system- consists of thermometric, pluviometric, hydrometric stations, as well as stations to measure the discharge of watercourses. The River Authorities were established by Statute no.183 of 18.05.89 aimed at land defence. Italy's territory was classified into basins of national, regional and interregional importance based on the size of the basin. Basin authority bodies have the goal of understanding, compiling directives for land defence, and planning land intervention works. Statute no.225 of 24.02.92 includes temporary scientific research bodies such as G.N.D.C.I. - National Hydrogeological Disaster Defence Group (Gruppo Nazionale per la Difesa dalle Catastrofi Idrogeologiche), which coordinates and gathers all major authorities in this area from C.N.R. (Consiglio Nazionale delle Ricerche) and from major university institutions through congresses and periodic meetings to gain an overview of the main lines of research and modelling. The latter body collaborates directly with Commissione Nazionale Previsione e Prevenzione Grandi Rischi [national commission for the forecasting and prevention of large risks], with which it develops prevention plans and emergency plans.
5.3 Spain

5.3.1 Overall organization

In Spain, policies and in particular civil protection, are vastly delegated to regions. Regional Governments develop their own policies, strategies, and plans – but always within the National framework. They also own the fire-fighting resources and provide a Regional Command Centre. The Territorial Plan provides the legal framework to manage resources and to coordinate services when facing emergencies. For instance, the Civil Protection Services within the Valencia Region are structured according to the Valencia Territorial Plan (Law 243/1993).

Law 2/1985, 21st January, about Civil Protection

This law defines civil protection as the physical protection of people and good in a situation of severe collective risk, public calamity or extraordinary disaster.

This law establish the institutional framework to put into operation the Civil Protection system, involving human and material resources from Public Administrations, but also from private companies and citizens. Civil protection corresponds to the National Administration and implies arrangement, planning, coordination and management of all public services related to face emergencies.

Civil Protection Basic Rule – Royal decree 407/1192, 24th April

This Basic Rule defines civil protection plans in terms of forecasting the organic and functional framework and mechanisms to permit human and material resources mobilization. This basic rule also sketches out the coordination among different public organisms to take part in case of emergencies.

This Rule considers two kinds of plans:

- Territorial plans, which address the general emergencies that can happen in the corresponding territorial level
- Special plans that address catastrophic situations derived from nuclear emergencies, warlike situations, floods, earthquakes, chemical hazards, transport of dangerous goods, volcanic activity and forest fires

This Rule also defines risks considered in special plans, establishing guidelines for each risk management.

5.3.2 Basic Guidelines for Civil Protection Planning in Forest Fires and in Floods

These guidelines establish basic criteria for all public administration in charge of developing forest fire territorial plans. This constitutes a common framework that guarantees coordination and common actions for all services and administrations involved.
In the case of forest fires, National organisms (DGCN, DGPC, Meteorological National Institute, Defence Ministry), Regional Administrations and the Spanish Federation of Provinces and Municipalities participated in the guideline elaboration. In the case of floods, National organisms (DGPC, DGOHCA, INM, Defence Ministry), Basin Organisms and Regional Administrations participate in the guideline elaboration.

Again, the actual strategies and plans are developed at regional level. For instance, the region of Valencia has elaborated plans for the following risks:
- Floods
- Forest fires
- Earthquakes
- Snowfall
- Chemical risks
- Transportation of dangerous goods

**Fire**

The Basic Guideline of Civil Protection for fires planning states the basic elements for emergency planning: analysis of risk, vulnerability and territorial delimitation. These elements evaluate the forest fire probability assigned to a certain area and the fire consequences.

The National Plan of Civil Protection for forest fire emergencies establishes the need to generate fire risk maps in order to optimise prevention infrastructure and combat resources investments.

The Basic Guideline of Civil Protection for fires planning states the danger periods of forest fires during the year. Such periods are fixed taken into account risk and vulnerability evaluations.

**Floods**

The Basic Guideline of Civil Protection for floods establishes the following basic elements for planning: analysis of flood risk and territorial delimitation. Both elements are based on the analysis of potential flood areas and the analysis of flood potential risk.

This guideline also considers the study of vulnerability which shall take into account features of elements in danger, location of such elements and if available hydraulic magnitude to define flood behaviour.

The Basic Guideline of Civil Protection for floods states that the analysis of territorial delimitation shall be completed with population, buildings and infrastructures potential damages. Besides, points of conflict shall be underlined and classified to avoid grave threat to damages or flood effects.

The Basic Guideline of Civil Protection for floods classifies potential flood areas following potential risks. These flood areas are determined taken into account historical data and potential damages to population, goods and infrastructures. Besides evacuation areas are also included.
5.3.3 Spanish Forest Strategy and Forest Plan

The DGCN has elaborated the Spanish Forest Strategy (EFE) oriented to nature conservation and sustainable use of biologic diversity. The EFE plan the following improvements:

- Creation of a Sectorial Group involving all Administrations linked to forests
- Upgrading of Law of forest and exploitation of forest resources
- Updating of National Forest Inventory and Forest statistics

The Spanish forest policy is carried out by means of EFE and the Forest Law. The basic principles of the Spanish policy are:

- Elaboration of exhaustive analysis of current situation of Spanish forests
- To guarantee forest sustainability function
- To ensure the social, economic and ecologic functionalities of forests
- Regulation of responsibilities related to forests

**Spanish Forest Plan**

The Spanish Forest Plan is the application of the Spanish Forest Strategy. The plan structures the actions needed to develop the Spanish Forest Policy. It is mainly based on the following principles:

- Sustainable development
- Multi-functionality of forests
- Contribution to territorial and ecological cohesion
- Public and social involvement in policies, strategies and programmes

The main objectives of the Spanish Forest Plan are:

- To promote territory protection from erosion and soil and water degradation by means of reforesting
- To promote forest sustainable management by means of arrangement and forestry
- To stimulate and improve forest productions as other economic option and driving force for rural development
- To protect forests from fires, plagues, biotic agents, pollution…
- To promote biological diversity conservation
- To foster recreational use of forest
- To maintain and improve activities related to training, information and forest research
- To consolidate the framework for collaboration among institutions involved in forest activities

The EFE includes policy against forest fires; this is regulated by the national Law 81/1968 about forest fires and also by regional laws. In Spain, regions have responsibilities in management of forest. They develop their own forest policies and strategies, within national framework, and operate their plan for regulation and management of forests.
The Spanish Forest Plan proposes the continuous updating of statistics of interest for the forest fire fighters and for the forest sector.

The National Forest Inventory is a project containing all the information regarding Spanish forest. This inventory collects basic information for forest management as vegetation type and fuel type. This Plan also proposes the continuous updating of forest information: forest fire statistics and forest maps, among other.

The National Plan for Civil Protection obliges Regional Administrations to collect fire information in standard forest fire reports. This information shall be provided to National Administration to elaborate global statistics.

5.3.4 Forest Draft Bill

This draft bill is under revision and passing is planned for the end of 2003. The previous current Forest Law has been valid since 1957. This new law objective is to be the tool to guarantee the Spanish forests preservation; it is also intended to promote forest restoration, improvement and rational exploitation.

The draft bill is based on the concept of sustainable forest management. The forest management mainly implies recognition of forests multi-functionality, preservation of natural environment, cooperation among public administrations and integration into European policies.

Regarding forest fires, the draft bill considers the relevant role of society to prevent fires.

The law text establishes the need for coordination among all administrations involved in prevention and extinction. The regional administrations will state the forest fire high risk areas and they will create defence plans for all areas. The law also guarantee that all burned areas shall be restored.

The draft bill pays special attention to the quality and updating of forest information which shall be captured and coordinated in the Spanish Forest Statistic. The Ministry of Environment is in charge of collection and updating of information.
5.4 **Sweden**

5.4.1 **Overall organisation**

The policies are mainly regulated through the following legal instruments:

- The Rescue Services Act (1986:1102)
- The Rescue Services Ordinance (1986:1107)
- The Ordinance with Instruction for the Rescue Services Agency (1988:1040)
- Local Government Act, regulates administrative rules for the municipalities
- Planning and Building Act, regulates planning and building issues
- The Ordinance with Instruction for County Administrative Boards

**The Swedish Rescue Services Agency**

The legislation regulates accident prevention, preparedness and response. The Swedish Rescue Services Agency has the national responsibility for developing and promoting policies and practical measures to make improvements in respect to accident prevention, preparedness and response. In the event of an accident, the Agency supports the municipalities and contributes thereby to the limitation of injury suffered by people and damage to the environment and property.

The Swedish Rescue Services Agency is thus the central government authority for national coordination of matters related to emergency prevention, preparedness and response and at national level for the inspection of the rescue services. Its tasks include coordination between the various concerned government agencies involved in these matters and inspection of the county administrative boards’ management in the field, including planning for the rescue operations in the event of serious accidents for which it becomes necessary for a board to take over operational responsibility, which is always the case in the event of a release of radioactive substances. The Agency also has the duties in respect to research, development and testing, monitoring of development in respect to risks in society and promoting measures to be taken for the protection of the population and prevention of accidents.

The Swedish Rescue Services Agency has in accordance with a Government Decision in the follow up to the Rio Declaration on sustainable development been given the national sector responsibility in respect to environmental accident risks.

**Responsibility of Municipalities or Local Governments**

Each local government has the responsibility for the rescue services in the municipality and for measures to prevent fires or damage from fires and shall also promote other action to prevent accidents and damage in the municipality. Besides the rescue services the Municipality or local government also has the responsible for physical or land-use planning, environment protection and social services.

**Responsibility of the County Administrative Boards**
Though the municipal emergency or rescue services play the most prominent practical role in this respect, the County Administrative Board has a more general task of coordinating the efforts within the County. When a serious accident requires overall coordination between municipalities, the Board is obliged to take over responsibility for the response operation. At the regional level, the County Administrative Board has an overall responsibility for carrying out risk analyses and ensuring that the municipalities take national interests into consideration.

Other areas of responsibility are the development of systems for warning of the population and the provision in its area of competence of a basis for the implementation of safety in the planning and building code and the environmental protection code. This means that there is an holistic responsibility at local level for ensuring the safety and well-being of the citizens and the protection of the environment from risks. The rescue services have together with all the other municipality departments an overall responsibility for risk assessment within the municipality. This is underlined in the new Swedish legislation to be introduced in 2004.

**Early Warning and Alarming**
Authorities responsible for rescue services have a legal obligation to ensure that there are means for alarming the rescue services. There is an obligation for operators of hazardous activities to alarm the responsible authorities of any release of poisonous and harmful substances or any danger of such a release. Also individuals have a responsibility for warning persons at risk and notifying authorities of accidents. The Swedish Meteorological and Hydrological Institute (SMHI) is responsible for providing the authorities with warnings for floods and storms. They also deliver a daily risk map for forest fires.

The new Swedish Legislation on Protection against Accidents encompasses the three phases, i.e. before, during and after an emergency, and contains the following main elements:

- Clearly defined responsibility for individuals
- Preventive measures are put in focus
- National targets are to be set
- In consequence detailed regulation can be limited
- Action Programmes are to be elaborated by each municipality
- Investigation and evaluation shall be made of all accidents

The fundamental responsibility for taking necessary measures for the protection of life, property and the environment and for not causing accidents is put in the new legislation on the individual, which includes the citizen, property owners and operators of hazardous activity. The citizen must therefore take measures for protection against accidents and is responsible for warning and giving the alarm. A property owner is obliged to take preventive measures against fires and to establish necessary fire protection documentation concerning his property. An operator of a hazardous activity has to make a risk analysis and have adequate preparedness and response equipment and is also responsible for providing information. Preventive measures are put in focus and each municipality shall therefore:
• promote security and safety for those staying in the municipality
• have the responsibility for ensuring that preventive measures are taken in particular to avoid fires and damage from fires
• take action for the protection against other accidents than fire
• elaborate Action Programmes for the municipality based on an inventory and risk assessment
• cooperate with other municipalities for mutual use of available resources for conducting accident prevention
• conduct fire prevention inspections
• carry out inspections aiming at prevention of accidents

The overarching national safety target is that a satisfactory and equivalent level of protection of peoples life and health as well as of property and the environment against accidents shall be maintained in the whole country, taking due account of varying local conditions. The rescue services shall be planned and organised to ensure that rescue or response operations can be started within an acceptable time and conducted effectively. In relation to the present legislation, the new legislation has a framework character and in the future detailed regulation will be limited.

The municipality Action Programmes shall contain measures to be taken for the prevention of accidents and indicate the risks in the municipality which may require emergency response actions and the goals set up by the municipality for the measures to be taken. The Programmes shall also indicate the municipality’s planning of and organisation for taking the measures to prevent accidents. For the purpose of establishing adequate rescue services the Programmes shall indicate the risks in the municipality which may require emergency response actions and the goals set up by the municipality for the rescue services. They shall also indicate the municipality’s capacity for emergency response in peace and war

Each municipality shall ensure that accidents which have required emergency response actions are investigated and evaluated to explain if possible the cause and course of events. Evaluation will also be made of the emergency response action.

5.4.2 Forest fire management

Since many years, Swedish Meteorological and Hydrological Institute elaborates fire risk indexes. In case of a high index, or if otherwise called for, local authorities issue a ban to all open burning activities. This includes grass burning, camp fires and prescribed fires in the forest as well. It is up to the local fire chief, however, to make exemptions. This is nearly always needed in the case of prescribed fires, since the fire danger index is regularly at a high level when conditions are right for burning.

During periods with high danger ratings, an aerial fire detection system is operated. Light private airplanes with a pilot and an observer/navigator are flown along fixed routes once (or sometimes twice) a day. The crew is not paid for this work, but the state pays for the airplane and the pilot gets free flying hours.

All suppression of fires is handled by the communes (townships) through their fire brigades (rescue service). There is no separate organization that especially handles forest fires. The state has little
direct control over the communes and how fire suppression is organized. Communes (including cities) differ in population from 3000 to 700,000. The big communes have fire brigades that are operated by full-time professional fire fighters. In the smaller communes, fire fighters work part-time and are called in when needed.

5.4.3 Flood management

The Swedish meteorological and hydrological Institute elaborates flood risk indexes

- Computation of hydrological forecasts on runoff and water levels
- Dissemination of hydrological information and flood warnings in Sweden

The Government has submitted a bill to the Swedish Parliament containing a proposal for a new law on Protection against Accidents which may require Emergency Response Actions. The new law is expected to replace the Rescue Services Act and come into force in 2004. It will be supplemented by a new ordinance and a new instruction for the Rescue Services Agency.

5.4.4 National Centre for Lessons Learned in Karlskoga

In accordance with a Government Decision the Swedish Rescue Services Agency has established a National Centre for Lessons Learned in Karlskoga. This is under successive development and expansion in cooperation with other relevant authorities, industry and research institutions. The overall aim of the Centre is to exchange experience and provide an important input to the development of a common methodology on risk mapping with a focus on risks for environmental or industrial major accidents, taking into account experience of and lessons learned from the accidents that have occurred.

The purpose of learning lessons of the accidents and near-accidents that occur can be summarised as follows:

- Making assessment and formulating views in common on the lessons learned will be beneficial for all the stakeholders as it creates a relationship between the overall perspective and that of the different parts or sectors involved.
- A common assessment and view will provide a foundation for an increased client related perspective due to the coordination achieved of a number of parallel systems for reporting and dissemination of data and knowledge which will in its turn lead to improved motivation and competence for all involved.
- Learning horizontally across sectors will allow for benchmarking based on the best from each sector, speciality and discipline.
- Common development activities within certain areas for instance development of methodology will lead to more efficient use of resources.

With the prevailing perspective of a limited number of young well educated and qualified personnel available in the future, a common Centre working in cooperation with similar centres in other countries will ensure access to competent experts also in the longer perspective.
5.5 Germany

5.5.1 Overall organisation

The Bund or federal state is responsible only for the defense of populations in case of war (Zivilschutz) or extended protection against disasters (erweiteter Katastrophenschutz). The civil protection in a more restrictive sense (Brand- und Katastrophenschutz) is the responsibility of the Länder. For instance, in Sachen-Anhalt, the organisation of emergency and rescue is laid down in the Katastrophenschutzgesetz des Landes Sachsen-Anhalt 13 July 1994, modified on 9 August 1995 and 25 April 2002.

5.5.2 Federal Water Act

The Federal Water Act (Wasserhaushaltsgesetz, WHG) of 19 August 2002 defines in broad terms the management of water and water bodies in Germany. It is aligned on the European water directive. The article 32 dealing with flood plains, is the main legal basis for flood prevention in Germany. The responsibility to “designate areas as flood plains and adopt regulations designed to protect against the risk of flooding” is given to the Länder. Each Land adopts a specific law on this respect. According to such law flood-prone areas are strictly defined and delimited. The type of construction or works allowed is strictly defined.

5.5.3 Joint Federal Government and Federal State Flood Defence Programme (Sept 2002)

The programme highlights the need to maintain natural flood plains to permit rivers to flood on to undeveloped land. Agricultural land on flood plains should be adapted to prevent soil erosion and water catchments systems should be used to regulate floodwater. Flood defence infrastructure damaged in the recent Elbe floods should be repaired without delay. Rivers should be returned to their natural state, reservoirs should be used to control flooding and the amount of sealed land should be reduced to improve drainage. The report suggests prohibiting new developments in areas prone to flooding (this should be reflected in Federal State legislation). It also advocates strengthening the Federal Government’s competence in flood management to ensure national standards. Further points include a risk analysis of built up areas in flood risk zones, flood forecast and warning systems for all rivers and a Federal Government review of hazardous sites located in high risk areas.

- Inter-state action plans and international conference
  Flood prevention strategies should not stop at federal state or national boundaries. By the end of 2003, existing flood defence plans should be reviewed and augmented. Plans should include cross-boarder forecasting and warning systems. The report calls for improvements in international cooperation. To this end, Germany will host an international flood prevention conference in 2004.

- European cooperation
  The Federal Government will give political and financial support to flood alleviation projects that require cross boarder development planning. More use should be made of European funding for flood prevention measures in rural areas.
• **River development**

The programme requires environmental and conservation authorities to examine plans to develop rivers for shipping for their impact on flood control. The Elbe is highlighted as lacking a comprehensive development plan. Plans for a series of dams to deepen the Danube between Straubing and Vilshofen will be continued.

### 5.5.4 Government Consults on Flood Prevention Bill

A year after the serious flooding of the river Elbe, Federal Environment Ministry has published a Flood Prevention bill. The legislation will preserve flood plains by restricting activities such as construction and agriculture.

In line with Germany’s constitution, the Federal Government only has framework responsibility for flood defence policy. The ‘Law to Improve Flood Prevention’ will bring in changes to a range of Federal laws which regulate flooding within the Federal Government’s competence: the Water Framework Act, the Construction Act, the Spatial Planning Act, the Federal Waterways Act and the Act on the German Weather Service. But the Federal States will be responsible for much of the implementation and will be required to transpose the new provisions into their own laws. The draft builds on the Flood Defence Programme published by the Environment Ministry (BMU) in September 2002. The bill includes the following provisions:

- **Within five years of the legislation taking effect, the Federal States will be required to identify flood plains and ‘areas in danger of flooding’ in their spatial planning strategies.** Flood plains are defined as areas that are statistically at risk of flooding at least once every 100 years, whilst areas prone to flooding are those that are likely to flood at least once every 200 years – including areas likely to be affected if dykes break. The States must pass their own laws to protect these areas.

- **The states must introduce legislation to prohibit several activities on flood plains (agricultural activities, building constructions).**

- **Federal State laws must regulate the storage of items likely to be hazardous to water in ‘areas in danger of flooding’.

- **Rivers and canals must be managed in a manner unlikely to exacerbate flooding.**

- **The German Weather Service shall be more involved in flood prevention in order to provide timely flood warnings.**

- **The Federal States will be required to draw up flood prevention strategies and clear them with neighbouring countries.**

- **All individuals in flood-prone areas have an obligation to take preventative measures to minimise damage and to use their land in a way that reduces risks to human safety, environment and possessions.**
5.6 Portugal

5.6.1 Overall organisation

The protection of civil population and goods against natural hazards resides on the SNBPC, whereas DGRF undertakes the role for national coordination and generation of national plans for forest management.

SNBPC, Serviço Nacional de Protecção Civil, is the Civil Protection Service under direct supervision of the Minister of Internal Affairs and is the main responsible for carrying all emergency and disaster management activities in Continental Portugal.

The Direcção-Geral dos Recursos Florestais (DGRF) was created in 2004 from the former DGF (Direcção-Geral de Florestas) plus the forest-related roles formerly committed to the several Regional Directorates of Agriculture (DRA, Direcções Regionais de Agricultura). It is under the Ministry of Agriculture, Rural Development and Fishing.

5.6.2 Basic guidelines for forest fires and floods

Basic Law of the Portuguese Civil Protection (Lei Orgânica do Serviço Nacional de Bombeiros e Protecção Civil)

The Lei Orgânica do Serviço Nacional de Bombeiros e Protecção Civil is the law that rules the newly merged services of Portuguese Civil Protection (SNPC) and Firemen (SNB). It was published in 2003 just four months before the harsh fire season that struck the whole of Europe.

Although most people agree the two services are better off merged together, one of the causes that has been suggested as having increased the negative effects of the disaster was the fact that the structure was still not working as a whole at the time of the events.

The basic competences assigned to the new SNBPC in the Lei Orgânica are the prevention of risks associated with emergencies and the organisation of Firemen structures, as well as the coordination and control of its activities, namely:

- Elaboration and promotion of emergency plans;
- Provide technical support for institutions and activities in the field of civil protection;
- Coordinate civil protection operations with other national and international organisations;
- Education and outreach to the population;
- Evaluate and predict natural and technological risks;
- Elaborate fire safety regulations and enforce them;
- Promote the study and legislation of proper techniques of prevention and assistance;
• List and inspect civil protection resources available;

• Organise a National System of Alert and Warning to the populations and decide on which warnings to issue;

• To advise on and propose legislation regarding civil protection matters;

• Manage and control firemen operations, and approve the creation of new structures;

• Guarantee continuous training of firemen.

Its operational duty is to assist in emergency and disaster occurrences, the mobilisation of extraordinary resources, including international assistance, issue alerts and warnings to the population and coordination of dependant and subsidiary organisations.

These organisations are the Agents of Civil Protection and include:

• GNR and PSP police forces;

• Armed Forces;

• Maritime and Aeronautic Authorities;

• INEM, the National Institute of Medical Assistance and the Portuguese Red Cross;

• All relevant public institutes such as the DG Forests (DGRF), the Water institute (INAG), the Portuguese Geographic Institute (IGP), Meteorology Institute (IM), the Environment Institute (IA), the Nature Conservation Institute (ICN), the Regional Directorates of the Ministry of Agriculture (DRA) and of the Ministry of Cities, Planning and Environment (DRAOT);

• Firemen associations

• Public Social Security institutions and other Healthcare and Social Institutions subsidised by the State

• Local institutions responsible for forests, parks and natural reserves, industry, energy, transports, telecommunications, hydrology and environment

• Private security and healthcare companies

The SNBPC is organised under the Ministry of Internal Affairs.

**Basic Law of the DG Forests (Decreto-Lei que cria a Direcção-Geral dos Recursos Florestais)**
The Direcção-Geral dos Recursos Florestais (DGRF) was created in 2004 from the former DGF (Direcção-Geral de Florestas) plus the forest-related roles formerly committed to the several Regional Directorates of Agriculture (DRA, Direcções Regionais de Agricultura). It is under the Ministry of Agriculture, Rural Development and Fishing.

DGRF is responsible for elaborating and enforce Forest-related policies, including game and fishing in inner water bodies. Its main tasks are:

- Help define the policies for the forests at national level
- Legislate and enforce the activity of both public and private agents intervening in the forests;
- Mediate conflicts of interest in the field of forest policies, fire prevention, and of the overall protection of forests and its activities.
- Preventive silviculture, including cleaning of forests, paths and water points;
- Surveillance through the Direcções Regionais da Agricultura (Regional/District Directorates of Agriculture);
- Elaborate protection plans against forest fires.

And, at operational level, management of the network of lookout towers, overall supervision of forest activities, management of the Forest Guard, early warning to the firemen and damage assessment in the aftermath of the fire.


The White Paper was produced as a result of the disastrous wildfires that struck Portugal in the summer of 2003. It provides a thorough analysis of the Civil Protection System and the way in which the Emergency Plans were activated and carried out.

It provided a set of recommendations, many of which are likely to be adopted and that will probably change some of the procedures listed in this document. The most relevant recommendations are the following:

- Consolidate the work and management strategy of the Civil Protection and Firemen Service, completing the merger;
- Reassess the scope and guidelines of the National Firemen School to include training also in the field of civil protection and strengthen the areas of training in operational command, field command and forest fires. Creation of District branches and applied research centres;
• Organisation of Quick Reaction Reinforcement Groups in order to give support to local firemen structures in a timely and effective manner;

• Plan the restructuring of the fire fighting resources available to the firemen, including personal protection gear, standardisation of vehicles, telecommunications and relationship with aerial support contractors;

• Update of the National Emergency Plan;

• Creation of an Agency for the Prevention of Forest Fires (see following chapter);

• Restructuring of the Municipal Civil Protection services in a number of fields including the creation of Permanent Response Groups, creation of the legal status of the municipal civil protection officers, and the creation and maintenance of Municipal Emergency Plans;

• Clarify the responsibilities of each of the actors intervening in the forests and its relationship with the SNBPC, especially the DGRF and the Armed Forces;

• Assessment and restructuring of the Operational Centres of Emergency, Civil Protection Emergency Plans and National Commission of Civil Protection;

• Clarify the role of the various layers of the command chain, especially at District level between the District Coordinators and the Commanders of Emergency Operations.

Basic Law of the Water Institute (Lei Orgânica do Instituto da Água)

The INAG is the service responsible for the management of all matters concerning coastal and inner waters in Portugal. It is organised under the Ministry of Cities, Planning and Environment and the roles assigned to it are the following:

• Elaborate availability and necessity plans for hydrological resources at national level;

• Elaborate river basin and coastal plans;

• Promote and enforce measures towards the required quantity and quality levels of hydrological resources;

• Guarantee safety of dams;

• Elaborate prevention plans against floods.

At operational level, INAG is responsible for the physiographic surveys of the river basins most affected by floods and for performing interventions to carry out the measures inscribed in the prevention plans. These include building walls, bridges, protections and safety basins, as well as the cleaning of riverbeds.
Agency for the Prevention of Forest Fires (Agência para a Prevenção de Fogos Florestais)

The Agency for the Prevention of Forest Fires was one of the recommendations made in the “White Paper on the Forest Fires of the Summer of 2003” and was created in April 2004 under the Ministry of Agriculture, Rural Development and Fishing.

Its mission is to coordinate strategies and interventions at national level for a better forest protection in the prevention phase.

Its main responsibility is to liaise between the different entities with legal responsibilities over the forest and forest fires. It should elaborate the National Plan of Prevention and Protection of the Forest against Forest Fires (PNPPFCI, Plano Nacional de Prevenção e Protecção da Floresta contra os Incêndios Florestais) and promote a greater public awareness.

5.7 Greece

5.7.1 Overall organisation

In Greece, policies and in particular civil protection, are based on a general civil protection plan developed on 7/4/2003 according to the national law (3013/2002) about civil protection. Under the policies and strategies of this plan, numerous services at national, regional and local level are involved in the operation level of their respective plans. Regional and Local Authorities develop their own plans but always within the National framework. For example, the strategies, policies and the management of the resources at local level in case of emergencies are structured and managed according to the legal framework of the National Plan.

Law 3013/2002, 1st May, about Civil Protection

This law defines that civil protection, aims on the protection of people’s life, health and property in a situation of severe collective risk from natural, technological or other disasters.

This law establish the institutional framework to put into operation the Civil Protection system, involving human and material resources from Public Administrations, but also from private companies and citizens. Civil protection corresponds to the National Administration and implies arrangement, planning, coordination and management of all public services related to face emergencies.

Civil Protection Basic (General) Rule (Plan) – N.1299/2003, 7th April

This Basic Rule defines civil protection plans in terms of forecasting the organic and functional framework and mechanisms to permit human and material resources mobilization. This basic rule also sketches out the coordination among different public organisms to take part in case of emergencies.

This Rule defines three levels of catastrophe (local, regional, general) and establishes the guidelines for planning development at local, regional and national level of all services and authorities involved respectively. Plans are developed to address: a) general territorial planning and b) special
planning that demands extra co-ordination or extra mobilisation to face special catastrophic situations.

5.7.2 Basic Guidelines for Civil Protection Planning in Forest Fires and in Floods

These guidelines establish basic criteria for all public administration in charge of developing forest fire territorial plans. This constitutes a common framework that guarantees coordination and common actions for all services and administrations involved.

In the case of forest fires, National organisms (Ministry of Public Order, Defence Ministry, Ministry of Rural Development and Foods), Regional and Prefecture Administrations and Municipalities participated in the guideline elaboration. In the case of floods, National organisms (Defence Ministry, Ministry of Environment, Land Use and Public Works, Ministry of Rural Development and Foods, Ministry of Mercantile Marine), Regional and Prefecture Administrations and Municipalities participate in the guideline elaboration.

Fire

The Basic Guideline of Civil Protection for fires planning states the basic elements for emergency planning: analysis of risk, vulnerability and territorial delimitation. These elements evaluate the forest fire probability assigned to a certain area and the fire consequences.

The National Plan of Civil Protection for forest fire emergencies establishes the need to generate fire risk maps in order to optimise prevention infrastructure and combat resources investments.

The Basic Guideline of Civil Protection for fires planning states the danger periods of forest fires during the year. Such periods are fixed taking into account risk and vulnerability evaluations.

Floods

The Basic Guideline of Civil Protection for floods establishes the following basic elements for planning: analysis of flood risk and territorial delimitation. Both elements are based on the analysis of potential flood areas and the analysis of flood potential risk.

This guideline also considers the study of vulnerability which shall take into account features of elements in danger, location of such elements and if available hydraulic magnitude to define flood behaviour.

The Basic Guideline of Civil Protection for floods states that the analysis of territorial delimitation shall be completed with population, buildings and infrastructures potential damages. Besides, points of conflict shall be underlined and classified to avoid grave threat to damages or flood effects.

The Basic Guideline of Civil Protection for floods classifies potential flood areas following potential risks. These flood areas are determined taken into account historical data and potential damages to population, goods and infrastructures. Besides evacuation areas are also included.
5.7.3 Greek Forest Strategy and Forest Plan

The General Directorate of Forest and Natural Environment (GDFNE) has elaborated the Greek Forest Strategy (GFS) oriented to nature conservation and sustainable use of biologic diversity. The GFS plan the following improvements:

- Upgrading of Law of forest and exploitation of forest resources
- Updating of National Forest Inventory and Forest statistics

The Greek forest policy is carried out by means of GFS and the Forest Law. The basic principles of the Greek policy are:

- Elaboration of exhaustive analysis of current situation of Greek forests
- To guarantee forest sustainability function
- To ensure the social, economic and ecologic functionalities of forests
- Regulation of responsibilities related to forests

Greek Forest Plan

The Greek Forest Plan is the application of the Greek Forest Strategy. The plan structures the actions needed to develop the Greek Forest Policy. It is mainly based on the following principles:

- Sustainable development
- Multi-functionality of forests
- Contribution to territorial and ecological cohesion
- Public and social involvement in policies, strategies and programmes

The main objectives of the Greek Forest Plan are:

- To promote territory protection from erosion and soil and water degradation by means of reforesting
- To promote forest sustainable management by means of arrangement and forestry
- To stimulate and improve forest productions as other economic option and driving force for rural development
- To protect forests from fires, plagues, biotic agents, pollution…
- To promote biological diversity conservation
- To foster recreational use of forest
• To maintain and improve activities related to training, information and forest research

• To consolidate the framework for collaboration among institutions involved in forest activities

The GFS includes policy against forest fires; this is regulated by the national Forest Protection Law 998/79 and its revisions: a) Law 1845/89, b)2612/98 also by regional laws. In Greece, regions have responsibilities in management of forest. They develop their own plans according to national guidelines of GDFNE and GFS for forest policies and strategies, within the national framework, and operate their plan for regulation and management of forests.

The GDFNE is continuously updating of statistics of interest for forest fires and for the forest sector in general.

The **National Forest Inventory** is a project containing all the information regarding Greek forest. This inventory collects basic information for forest management as vegetation type and fuel type. This Plan also proposes the continuous updating of forest information: forest fire statistics and forest maps, among other.

The GDFNE obliges Regional Administrations to collect fire information in standard forest fire reports. This information shall be provided to GDFNE to elaborate global statistics.

### 5.7.4 Forest Draft Bill-Recent Revision (Law 3208/2003) 24th December

Forest Law has been valid since 1979. Since then the most recent revision is the law 3208/2003 which passed on December 2003 with emphasis on the protection of the forest ecosystems, improvements on land use planning and further regulation on forest-ownership differentiation.

The draft bill is based on the concept of sustainable forest management. The forest management mainly implies recognition of forests multi-functionality, preservation of natural environment and bio-diversity and integration into European policies.

Regarding forest fires, the basic forest protection draft bill (Law 998/79) and the revisions: a) Law 1845/89, b)2612/98 establish the responsibilities among the services involved in confronting forest fires and consider the relevant role of society to prevent fires.

The law text establishes the need for coordination among all administrations involved in prevention and extinction. All regional and local administration based on the state of their forest fire risk areas create defence plans for all areas. The law also guarantee that all burned areas shall be restored.

The Ministry of Rural Development and Foods is in charge of preventing measures and of collection and updating of information of Greek forest statistics. The Ministry of Public Order (Fire Brigade) is in charge of suppression efforts. The Ministry of Interior (General Secretariat of Civil Protection-GSCP) supports and co-ordinates the involvement of regional and local authorities and also that of volunteers in both preventing and suppressive measures.
5.8 Lithuania

5.8.1 Overall organisation
The Fire and Rescue Department and the Department of Civil Protection have under the Ministry of Interior the general national responsibility for dealing with emergency matters. At present a reorganisation process is going on, and the two departments are expected to merge into one in the beginning of 2005. Also other central government authorities have responsibilities in respect to forest fires and floods, for instance the Ministry of Environment, the Hydrometeorology Service, the General Forest Enterprise and the GIS Division of the Institute of Organization of Forest Exploitation.

The Fire and Rescue Department has been in contact with the Ministry of Environment and the Department of Civil Protection and provided them with an information on GMES and RISK-EOS. Both institutions agreed that participation in GMES could be useful for Lithuania. The suggestion is that representatives of concerned institutions discuss conditions of participation, as well as their capabilities and needs. The General Forest Enterprise is going to establish a Satellite Meteorology Information Receiving and Processing Station in the end of 2004 which will receive data from the meteorology satellite Meteostat Second Generation-MSG-1 every fifteen minutes. In addition to meteorological and hydrological data, information about fires and floods will also be available. Satellite observation information will be handled with relevant software. The Ministry of Environment is being preparing a possible decision of the Government regarding Lithuania’s membership in EUMETSAT. It is expected that membership starts in 2005 and it has been noted that EUMETSAT collaborates with GMES.

The information provided below deals mainly with forest and peat fires, additional information related to the floods management will be provided as soon as possible.

5.8.2 The relevant Legal Instruments regulating the Lithuanian Policies:

- **Civil Protection Law** No VIII-971 of 15 December 1998
- **The Forestry Law of the Republic of Lithuania** No I-671 of 22 November 1994
- **State Forest Fire Prevention Program**, which was approved by the order No 91 of the Minister of Environment of March 4 2002
- Government Decree No 216 of 24 February 2000
- Governmental Decree No. 521 of 12 April 2002
5.8.3 General Information on Forest and Peat Fire and Flooding Risks

5.8.3.1 Forest and Peat Fires

According to official statistics, the forest land area in Lithuania covers 2,034,400 ha, or 31.2% of the country's territory.

Forest and peat fires have triggered serious problems in Lithuania in recent years. In 2002, noted for its dry season, 1,499 forest fires broke out in the country and damaged 797 ha of the green area. The firefighters from all over the country assisted in putting out 1,094 forest fires. Peat fires turned out to bother the firefighters most of all. They had to respond to 215 peat bog and peat grassland fires. In 2002, forest and peat fires made up 6.1% of the total number of fires throughout the country.

In 2002, 21,237 fires broke out in Lithuania with damages estimated to 30,758,785 Litas. In August and September 2002, a record number of peat-bog, peat grassland and forest fires was registered in the country’s history. At that time the number of fires with an area of more than 0.5 ha and an extinguishing period lasting more than 24 hours fluctuated from 70 to 104 fires around o’clock. On September 12, during the fire peak period a maximum burning area of 655.9 ha was registered. At that time the ultimate amount of fire and rescue equipment was deployed, 469 firemen responded to the fire scenes all over the territory of the republic, and 230 military persons and 204 personnel from the forestry stations were deployed and worked there. It has to be noted that the other activities of the Fire and Rescue Department were practically paralyzed during that hot time.

5.8.3.2 Floods

Floods are reported in Lithuania each year, and extremely severe floods occur on the lower reaches of the Nemunas River about every 12-15 years. The main reasons for the floods are the following: the Nemunas delta relief constitutes a lowland with a small inclination from east to west; sudden snow melting or long-lasting heavy rains; ice packs or dams are formed in the river; and the Nemunas river inclination in relation to the average water level of the Kursiu lagoon.

Such floods may cover the following areas: 9 communities/municipalities and 45 villages in Silute region; 1 community/municipality and 2 villages in Klaipeda region; 1 community/municipality and 7 villages in Kretinga region. A Silute - Rusne road section is flooded almost every time, which hinders transport communication with Rusne Island with about 2,500 inhabitants. In addition, there is a lot of property loss and damage: roads and protective dikes are washed away, electricity poles are turned down, residential drinking water wells are polluted, houses are damaged and regular human way of life gets interrupted. Bridges are threatened and damaged as well: the Nemunas high waters may wash away two bridges across the river: one is located near Panemune and consists of both auto transport and railway sections and the other is located on the Atmata influent to Rusne town.
5.8.4 Forest Fire Prevention Management

5.8.4.1 Legislation

As Civil Protection Law No VIII-971 of 15 Dec 1998 states that the Civil Protection System consists of state, county and municipal levels.

Implementing the state policy in the sphere of civil protection, the central authorities shall:

• Draw up civil protection and rescue system development;
• Lay down the procedure for implementing civil protection and rescue system priority development trends;
• Establish the emergency prevention procedure;
• Approve the levels of civil protection preparedness, emergency criteria;
• Approve national level plans of civil protection emergency preparedness, lists of objects of national significance, which are the likely hazards, basic public services provided to the population free of charge in the event of an emergency.

Counties shall:

• Organize the drawing up of plans of emergency preparedness of civil protection in the county;
• In the event of the likely emergencies organize and implement in the territory of the administrative unit preventive measures of civil protection;
• Make arrangements to mitigate the emergency effects, organize supply of search and rescue operations;
• Control the preparedness of executive bodies of municipalities to avert the likely consequences of emergencies or to mitigate the effects thereof.

Municipalities shall:

• Organize development of a plan of preparedness of civil protection in the event of emergencies;
• Warn public authorities, economic entities, and the population about an imminent emergency, inform about its nature, the likelihood of its spreading, and the necessary actions required of the population;
• Prescribe tasks and functions of civil protection for administrative units of the municipality, approve plans of civil protection emergency preparedness;
• Organize formation and training of civil protection forces;
• Organize and implement preventive measures of civil protection, rescue and other urgent tasks, mitigate the effects of emergencies.

Article 18 of The Forestry Law of the Republic of Lithuania No I-671 of 22 Nov 1994 states the following:

The integrated state fire protection system, which comprises survey, prevention and safety measures shall be established and maintained in forests regardless their ownership. The General Forests Enterprise at the Ministry of Environment, forest enterprises, and Directorate of National Parks in cooperation with local authorities lay down and organize the implementation of the integrated fire
safety system. Forest managers, owners, users and visitors shall observe forest fire protection requirements laid down by the legal acts.

Forest enterprises as well as national parks and local authorities allocate financial resources for the integrated state fire survey and fire fighting system within the whole forest holding. Forest managers and owners shall implement fire preventive measures (i.e. fire zones; fireplaces; fire prevention shelter belts; cleaning of rubbished forest) on their own financial resources. This law also states that main responsibility for forest fire management lays on the General Forest Enterprise under the Ministry of Environment.

State Forest Fire Prevention Program, which was approved by the order No 91 of the Minister of Environment of Mar 4 2002, determinates that unified state forest fire protection systems consists of the following elements:
- Forest fire forecast and monitoring;
- Forest fire prevention;
- Fire safety measures.

According Government Decree No 216 of 24 Feb 2000 forest fires and peat fires are classified as extreme situations. Therefore these emergencies must be included into emergency plans of counties and municipalities, as well as into emergency plans of forest enterprises.

5.8.4.2 Forest Fire Forecast and Monitoring
Hydrometeorology Service under the Ministry of Environment and General Forest Enterprise perform daily monitoring of forest fires rate.

During favorable for fires period (from March to October) the survey is carried on from 124 fire observance towers in addition, forest workers stand guard at forestry offices. Meteorological stations, 3 aero stations among them, are involved into the survey.

Fire rate data for the territory of municipalities and forest enterprises are available at web sites of mentioned institutions.

For the forest fire risk mapping digital maps at the scale 1/10000 – 1/50000 defining level of risk is being used by General Forest Enterprise. The GIS Division of the Institute of Organization of Forest Exploitation developed mentioned maps.

5.8.4.3 Forest Fire Prevention and Fire Safety Measures
The following fire prevention and fire safety means are being used in order to manage forest fires:
- Application of forest fire hazard classification system;
- Forest division into forest blocks;
- Installation and renewing of fire protective shelter belts;
- Installation of deciduous trees belts;
- Installation of fireplaces;
- Renewing of fire survey towers and fire equipment;
- Setting up fire warning signs;
- Maintenance of the forest roads’ network;
- Establishment and keeping fire teams at forest enterprises;
• Initial fire fighting measures at the forest districts;
• Operational fire response plans;
• Training of forest fires operation leaders;
• Public information via mass media;

5.8.4.4 Forest and Peat Fire Extinguishing
The following forces are participating in the extinguishing of forest and peat fires:
• Owners and users of forests;
• Fire teams at forest enterprises (functional since May until October);
• Municipal fire brigades;
• State-owned fire brigades;
• Armed forces (in cases of large fires).

5.8.4.5 Forest Fire Damage Assessment
The forest fire damage is assessed pursuant to the Governmental Decree No. 521 of April 12, 2002. According to the forest specie and age, fire damage is estimated from 5 up to 600 Litas for each tree or from 40 up to 200 Litas for 1 cubic meter of burnt timber. In addition costs of fire extinguishing, damaged area cleaning and afforesting, and well as forest equipment repair and effects elimination are to be added to the total costs.
5.9 The Czech Republic

5.9.1 Overall Organisation

The Civil protection is a relevant part of the security system which is an institutional tool for creating and implementing the Czech Republic’s security policy. Each element of the security system has its competences laid down under operative legislation. The elements are subject to central coordination and control but in some cases they may act autonomously within their areas of competence. The elements of the security system form a hierarchical structure. Their functional relationships and competences at every level are regulated by generally applicable rules, principles and specific procedures. The whole structure can quickly pass to the state of alertness and thus can produce a successful and orderly response in the initial stages of a crisis.

The security system comprises the competent elements of the legislative, executive and judicial branches, local government, as well as legal entities and individuals responsible for the Czech Republic’s security. It mainly includes the President of the Republic, the Czech Parliament, the Government, the National Security Council and its working bodies, central administrative authorities, regional and municipal authorities and their executive crisis management bodies, the Integrated Rescue System (Fire Rescue Service, Medical Emergency Service and Police), Armed Forces and Intelligence Services. The Integrated Rescue System in cooperation with others must take effective action in an emergency or crisis caused by terrorist attacks, natural and environmental disasters, industrial accidents, and other situations endangering lives, health, property, the environment, internal security, or public order in the Czech Republic.

The Government is the supreme executive body implementing the national security policy. It is responsible for the management and operational capability of the entire security system.

The National Security Council is a standing Government working body in the field of security. It coordinates and reviews activities in this field and presents proposals to the Government. In the field of national security the National Security Council can ask all ministers or heads of administrative authorities for information and analyses and charge them with tasks related to national security. It cooperates with Regional Security Councils. The National Security Council system also includes the Central Crisis Management Staff, a government working body in the field of crisis management. The Staff is activated in the event of a direct threat or crisis and presents proposals to the National Security Council or, if the circumstances require immediate action, directly to the Government. Chair the Staff is the Minister of the Interior (in non-military crisis situations) or the Minister of Defence (in military crisis situations).

Crisis readiness activities at regional and municipal levels are coordinated by regional or municipal security councils. Each head of regional government or chairperson of a municipal situations council is assisted by regional or municipal crisis management staff.

5.9.2 Legal framework

The Constitutional Law on the Security of the Czech Republic was endorsed by Parliament in April 1998. This law established the protection of human lives, health and property as basic state duties. This law also enables the Government to declare a state of emergency and the Parliament to declare a state of threat in the country. A state of war can only be announced through the Constitution of the Czech Republic.

The principal laws related to crisis management are:

- The Law on Crisis Management
\begin{itemize}
  \item The Law on Integrate Rescue System
    These two laws define the responsibilities of the Government, the Central Administrative Offices and the Territorial Administrative Offices, plus elements of the Integrated Rescue System. In addition, they stipulate crisis preparedness measures.
  \item The Law on Economic Measures for Solving Crisis Situations
    This law set up the preparation of economic measures for crisis situations and adoption of economic measures after crisis situations are declared.
    These three laws came into forces in January 2001.
\end{itemize}

\section*{5.9.3 Protection of population}
Tasks of the Civil Protection from the international humanitarian right point of view are defined in the Additional protocol I to Geneva convention from 12th August 1949. This Additional protocol concerns the protection of international conflicts victims having armed character and was accepted in Geneva 8th June 1997. This significant document became a part of our legal system in the whole extent.

Protection of population in the Czech Republic was transformed in January 2001. The responsibility for civil protection was transferred from Ministry of Defence to the Ministry of Interior.

In April 2002 the Czech Government approved Conception of population protection. Among others, Conception of population protection determines specific tasks up to the year 2006 and 2015. To the end of the 2006 were determined 19 tasks and to the end of the 2015 were determined 9 tasks.

Conception declares requirements toward citizens, municipalities, regions, the central administrative offices and juridical and self-employed persons.

\section*{5.9.4 Protection against floods}
Flood readiness and response is the task of special bodies created by regional and municipalities authorities. Their structure is coordinated by the Central Flood Response Commission, under the responsibility of the Minister of the Environment. The bodies control, supervise, coordinate and set tasks in all areas relevant for the protection against floods.
5.9.4.1 Flood Protection Measures
Flood Protection Measures are divided into two main groups:

A. Preventive measures and measures in situations posing flood danger:
   a) determination of flood plain areas;
   b) specification of limits for flood protection activity degrees;
   c) flood protection plans;
   d) flood protection inspections;
   e) organization of flood forecasting and reporting services;
   f) organizational and technical preparation;
   g) creation of flood reserve stock;
   h) clearing of flood plain areas;
   i) training of persons participating in flood protection activities;
   j) activities of the flood forecasting service;
   k) activities of the flood reporting service;
   l) warning in cases of danger of floods;
   m) establishment and activities of the watching service;
   n) flood recording and documentation.

B. Measures taken during flood
   a) regulation of flow regime,
   b) flood protection activities,
   c) flood rescue activities,
   d) activities aimed at ensuring substitute functions and services in territories affected by floods.

Flood documentation and assessment including the assessment of damage caused by flood, causal factors adversely affecting the flood, efficiency of adopted measures and proposals for amendment to flood protection measures constitute an integral part of flood protection measures.
5.9.4.2 Degrees of Flood Protection Activities

In The Czech Republic are three Degrees of Flood Protection Activities. Degrees of the flood protection activities are understood as levels of flood danger related to specified limits, which are normally water levels or water flows in reporting river sites or limits or critical values of other observed variables as stipulated in the respective flood protection plan. The extent of flood protection measures to be taken is governed by flood danger or flood evolution which shall be expressed by the following three degrees of the flood protection activities:

a) degree one (state of alert) begins in case of natural flood danger and ends when the causing factors of such danger disappear; it requires that increased attention be paid to the watercourse or some other source of the flood danger, the activities of the flood warning and watching services are commenced; at water management structures, this degree begins when the limit values of observed variables or safety parameters of the structure are reached or when unusual facts which could lead to special flood danger are being detected;

b) degree two (state of danger) shall be declared when the danger of a natural flood becomes reality; it shall also be declared when the limit values of the observed variables or safety parameters of a water management structure are being exceeded; the flood protection authorities and other participants involved in the flood protection are being activated as well as relevant technical means, and measures for flood mitigation as specified in the flood protection plan are being implemented;

c) degree three (state of emergency) shall be declared in danger of the occurrence of high damage and in situations when lives and property in the flood plain areas are endangered; it shall also be declared, simultaneously with initiation of emergency measures, when critical values of the observed variables or safety parameters of a water management structure are being reached; protection and, if required, rescue activities and evacuation shall be organised.

Degrees two and three of the flood protection activities shall be declared and terminated by the flood protection authorities for areas relevant to their territorial responsibility. The limits of water stages for declaring the second and third degree of the flood protection activities shall be specified in the flood protection plans.
5.9.4.3 Flood Forecasting and Warning Service

The flood forecasting service shall provide information to the flood protection authorities or other participants involved in the flood protection about possible occurrence of flood and further dangerous development, about hydrometeorological conditions indicating the occurrence and evolution of floods, especially about precipitation, and water levels and flows at selected river sites. This service shall be provided by the Czech Hydrometeorological Institute in co-operation with the administrator of the watercourse.

The flood warning service shall ensure information for the flood protection authorities for the purposes of warning the population at localities where flood is expected to occur and at localities located downstream, it shall provide information to the flood protection authorities and participants involved in the flood protection about the flood situation and shall submit reports and information necessary for evaluation of the flood danger and for organisation of the flood protection measures.

The flood warning service is organised by the flood protection authorities of municipalities and districts and other participants involved in the flood protection. In order to ensure the flood warning service, the municipal flood protection authorities shall organise the relevant watching service.

The owners of water management structures impounding water shall give notice of a special flood danger to the respective flood protection authorities and the Fire Rescue Servis of the Czech Republic and if danger is involved in delay, they shall warn directly natural persons and legal entities immediately exposed to the danger.

5.9.4.4 Flood Protection Plans

Protection plans are documents containing:

- the method of ensuring timely and reliable information on flood development;
- possibilities of influencing the runoff regime;
- organization and preparation of safety work;
- the methods of ensuring a timely activation of flood protection authorities;
- ensuring the warning and watching service and protection of structures;
- preparation and organization of rescue work and ensuring the basic functions disrupted by the flood in the facilities and the territory;
- the stipulated limits for degrees of flood protection activity.

Flood protection plans in the Czech Republic are drawn up in accordance with the water act. Flood protection plans of territorial units are:

- municipal flood protection plans, which shall be prepared by authorities of those municipalities whose territories are exposed to flood danger;
- flood protection plans of administrative territory of Municipal Authorities with extended competence;
- flood protection plans of administrative territory of Regional Authorities;
- Flood protection Plan of the Czech Republic, which shall be prepared by the Ministry of the Environment.
Flood protection plans for immovable assets and land exposed to floods due to being situated in flood plain areas or capable of exacerbating the flood evolution, shall be prepared by their owners for their needs and for co-operation with the municipal flood protection authority.

5.9.4.5 The governance of the flood protection activities

In the periods between floods the governance of the flood protection activities is ensured by the flood protection authorities which are:

- municipal authorities;
- municipal authorities with extended competence;
- regional authorities;
- the Ministry of the Environment; the Ministry of the Interior is responsible for ensuring the preparation of flood rescue activities.

Flood rescue activities involve technical and organizational measures carried out during the flood in areas in immediate danger or already flooded aimed at rescuing lives and property, in particular, the protection and evacuation of population from such territories, caring for them for the necessary period of time, rescuing property and its re-location outside the endangered territory.

During floods, the flood protection authorities are:

- flood protection commissions of municipal authorities, municipal authorities with extended competence and regional authorities;
- the Central Flood Protection Commission.
6 Needs for geospatial monitoring and Earth Observation techniques

Geo-spatial information is the very basic information piece to land planning and hazard mapping. It is also a requisite for emergency managers as a reference scenario for upcoming event management and training.

The terms of prevention plans, risk mapping, zoning plans, forecasting / awareness are recurrent in the laws described previously. To establish those mappings, the knowledge of structural and dynamic parameters such as vegetation conditions for the forest fire risk or the description of the draining basins for the flood risk, is mandatory. This is also true for the knowledge of land use and localisation of human settlements in the areas subject to natural hazards, which is a key component of the risk - in particular with phenomena such as the urban development, and the development of sparse habitat in the Mediterranean areas subject to forest fires.

As it was seen in the previous chapters, these processes – even if similar in their general objectives – are, in all Member States, performed at a regional or local level. It is at this territorial scale, mainly, that the corresponding geo-information is needed. Nevertheless the development of common methodologies for information collection and of harmonized approaches for risk mapping and anticipation, should optimize their effectiveness and facilitate the European harmonization.

Concerning the crisis management, a salient feature is the development of the cooperation between Civil Protection services of the Member States, through bilateral agreements and through the European cooperation mechanism. This calls for new tools for real-time crisis monitoring, allowing to share a common global vision of the situation - the European center of crisis management should be equipped with such tools. Real-time crisis monitoring in the meaning it is given locally, eg: for forest fire monitoring using helicopters, is also very important but probably out of reach with current satellites.

The prevention policies also call for disaster event mapping and damage assessment. The mapping of the areas burnt by forest fires is a required part of the regional fire prevention plans in many Member States legislation, and is also to be collected at the European level; similarly, flood history is usually one of the recommended instruments for risk estimation. The mapping of disaster events is, more generally, essential for an efficient experience feedback and for enhancing the citizens ’ awareness. Furthermore, a fast estimation of the damage will allow the quick allocation of specific logistic, human and economic means during the response phase.

Lastly, the monitoring of the areas which have been subject to disasters is requested in some cases, to monitor post-disaster recovery and to verify the application of land use limitations in the affected areas. A typical example is the Italian law forbidding reconstruction in the areas which have been subject to forest fires.

Satellite Observation, thanks to its capacity to deliver regular and global observation, is obviously a good candidate to fulfil these geo-information requirements.
Some steps have already been made in this direction. With the International Charter for Major Disasters, several Space Agencies have established a joint capacity allowing to rapidly obtain satellite observation data in case of major disaster in or outside Europe. Another example is the service delivered by the Joint Research Centre in the domain of forest fires.

However, as shown by the review of the needs made in this document, much remains to be done to fully exploit the potential of satellite observation.

The Civil Protection community, in its widest sense, has actively participated to many projects, conducted in the Member States or within the frame of European Research and Development programmes, to contribute to the definition and to the experimentation of new services based on satellite observation. The best experience from these projects has now to be transformed into operational services.