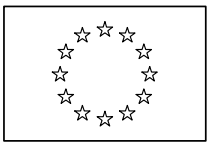


COMMISSION OF THE EUROPEAN COMMUNITIES

Brussels, 23.2.2009
SEC(2009) 202

COMMISSION STAFF WORKING DOCUMENT

Accompanying document to the

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

A Community approach for the prevention of natural and man-made disasters

IMPACT ASSESSMENT

{COM(2009) 82}
{SEC(2009) 203}

TABLE OF CONTENTS

1. INTRODUCTION

Events such as the disastrous forest fires of the recent summers as well as floods and droughts in different parts of Europe have built a political momentum for strengthening not only response at EU level but also prevention and recovery. Furthermore, the European Parliament[1] and the Council have both called for urgent work on disaster prevention[2]. This has been reflected by the Commission in its Communication on reinforcing the Union's disaster response capacity,[3] which announced that there would be an initiative on the prevention of disasters towards the end of 2008. This impact assessment is intended to inform the Commission in view of the adoption of a Communication "A Community approach on the prevention of natural and man-made disasters". This will be the first EU document addressing in a comprehensive manner this area of potential action by the EU. It is intended to trigger initial policy discussions between EU institutions and consultations of stakeholders.

The Communication will focus on evaluating whether a more comprehensive prevention approach could complement and give coherence to the existing sectoral and vertical approaches and reinforce the added value of Community action. It will cover natural and man-made disasters within the EU. It will not cover conflict-related complex emergencies.

At this early stage of policy development, the primary objective of this impact assessment is to provide the necessary information to support a policy decision on whether to develop an EU strategy on disaster prevention. A further objective is to inform a first round of policy discussion between the EU institutions and stakeholders on a wide range of options that could be further explored and assessed for potential inclusion in such a strategy. Thus, this report addresses the need for EU action, the potential added value of such action and includes a proportionate impact assessment of a large range of options, without suggesting at this early stage a final decision on options to be included in the strategy.

The European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions will be invited to provide the Commission with further input with a view to consolidating a Community strategy for the prevention of natural and man-made disasters. Stakeholders will also be invited to contribute to the development of the strategy.

On this basis, the Commission will carry out further consultations to promote this approach and if appropriate will propose to develop it further, accompanied by in-depth impact assessments of any option selected.

---

1 The European Parliament Resolution on the "regional impact of earthquakes" adopted on 14/11/2007 calls "upon the Commission forthwith to draw up a Communication evaluating the hazards posed by earthquakes and considering the questions of prevention and management (…)". It calls on the "Commission to evaluate all existing preventive, management and civil protection instruments to deal with natural disasters promoted by various EU policies (environment, cohesion policy, research, etc.) and to propose, in the interests of simplification and improved coordination, a centralised prevention and management instrument".

2 The June GAERC adopted Council Conclusions urging the Commission to come up no later than October 2008 with a Communication on the prevention of disasters.

3 COM(2008)130

2. PROCEDURAL ISSUES AND EXTERNAL CONSULTATION WITH MEMBER STATES AND STAKEHOLDERS

2.1. Internal preparation

Work on this impact assessment began in DG environment early in 2007 and was conducted with the assistance of an inter-service group that met three times in 2008 bringing together experts from relevant General Directorates.

The European Environment Agency also took part in one of the meetings.

The work has also built on the results of two external independent studies undertaken by COWI (Denmark) to identify prevention gaps in existing instruments and to analyse the approach taken by some Member States to prevention. In this context, four selected case studies have been conducted in France, Portugal, Romania, and Sweden. The reports provided by the consultant are available on the Europa website[4] and are based on an extensive study of existing publications in the area of disaster prevention.

2.2. External consultation with Member States and stakeholders

All stakeholders were invited to participate in a consultation meeting held on 14 April 2008 to comment on an issues paper, and the Member States were asked to provide written comments on the paper in May 2008.

Three specific stakeholder meetings of experts from Member States and private organisations were held in May 2008 to address in detail economic aspects, forest fires, and land use/risk mapping issues.

2.3. Key points emerging from the Communication with Member States

The contributions of the Member States on the issues paper suggest that:

– There is a need for, and significant added value in, European action in the area of disaster prevention. The influence of climate change on disasters makes such action increasingly necessary.

– EU action should support and complement national policies and measures and should take full account of national specificities, in particular regarding land planning.

– The EU should take an integrated approach addressing all types of disasters and the whole disaster cycle, encompassing prevention, preparedness, response and recovery.

– Research and work on risk identification and assessment is an area where the need for EU action is particularly clear.

– Some Member States are calling for targeted funding.

– Fire prevention is an area where the Community should consider specific action.

[4] http://ec.europa.eu/environment/civil/prevention_overview.htm

– There may be scope for EU initiatives to improve the resistance of buildings to seismic activity and extreme weather events.

– Disaster early warning systems should be established and/or strengthened.

2.4. Key points emerging from the consultations with stakeholders

There is a wide consensus among stakeholders on the need to strengthen disaster prevention efforts both at Member State and EU level and on the fact that EU action can provide added-value in this process. Similar vulnerabilities across Member States, related to complex ex-ante and ex-post disaster implications, call for increased coordination and cooperation between Member States at EU level, while bearing in mind that the protection of citizens is primarily a national responsibility.

Although an overarching multi-hazard approach to disaster prevention would be valuable in the long term, stakeholders' immediate demands focus on specific needs.

- Need for a knowledge base

The availability of an adequate knowledge base is essential for any effective preventive action at EU level. This involves raising awareness and ensuring adequate information, guidance, education, training and research on hazards, prevention needs and measures, for targeted stakeholders, decision-makers and the general public, as well as promoting exchanges of data and experience. Although knowledge on hazards and vulnerability factors exists in most Member States, access to specific information should be enhanced, and there should be specific research on disaster risk analysis, in particular through scenario development.

- Link stakeholders and policies

The EU could play a key role in supporting the development of links between the various actors and sectors involved in disaster prevention and in promoting consistency between spatial and emergency planning.

- Funding

Access to funding for fostering transnational cooperation on prevention should be improved by increasing financial resources, by earmarking specific funding and by providing guidance to potential applicants.

- The twin principles of solidarity and responsibility

There is a need to strike a balance between responsibility and solidarity, between damage prevention and compensation. Stakeholders’ opinions are divided on the principle of linking damage compensation to particular ex-ante or ex-post requirements. Economic resilience can be ensured through public/private partnerships, covering non-insurable losses such as moral/social damage and business interruption. Examples of good practice in this area exist in some Member States. The EU and Member States should ensure full implementation of existing disaster prevention provisions.

- Forest fires

On the question of forest fires in particular, stakeholders recommend prevention to be closely linked to forest management. They call for EU support for capacity building, early warning, fire investigation measures and targeted communication activities in vulnerable areas. In addition, in July 2007, the advisory group on forestry and cork adopted a resolution calling for re-establishing a financial instrument for forest fire prevention and environmental protection.

2.5. External expertise

This impact assessment has been conducted by the Commission with the assistance of a consultant specialised in assessments contracted by DG Environment (COWI).

2.6. Impact Assessment Board

A first discussion on the Impact Assessment took place on 18 June.

On 24 June 2008, the Impact Assessment Board issued a first opinion, asking for a resubmission of the impact assessment. The new draft sent to the Board on 3 July 2008 reflected the comments from the Board regarding a more in-depth analysis of the subsidiarity issue. The problem definition was reworked and expanded, and detailed examples of existing Member States' initiatives were provided. The new draft also gave an overview of existing funding and of existing limits. The drivers for preventive action in Member States were added to the report, as well as data on the administrative, social, and environmental impact of the options proposed.

On 28 July 2008, the Impact Assessment Board issued a second opinion, asking for further work on several issues. The revised version of the report provides additional information on the problem definition. It clarifies some subsidiarity issues and the value added of a Community intervention. Some clarifications on policy objectives and options have also been provided.

3. PROBLEM DEFINITION

3.1. General background: disasters, their impacts and benefits of disaster prevention

3.1.1. Growing number and severity of disasters

Natural and man-made disasters kill people, destroy property and the environment and pose considerable challenges to sustainable development[5].

Natural hazards affect practically all the Member States and candidate countries. They encompass many phenomena such as floods, earthquakes, volcanic eruptions, landslides, avalanches, forest fires and storms. Although the term "natural" is used to describe these hazards, man and human activities are often implicated to varying degrees in many disasters, such as forest fires and floods. At the same time, natural hazards can lead to disastrous natural events which may also have technological impacts (power failures linked to floods and fires, chemical pollution linked to earthquake damage).

Man-made disasters include technological or industrial accidents, but also critical security situations. Certain natural disasters tend to be recurrent, while technological disasters usually are not. Large and infrequent disasters can cause rare but significant negative impacts, while the impacts of smaller, recurrent disasters can turn out to be comparatively expensive in the long term.

Statistics on the number of natural and technological disasters in the various Member States are attached to the impact assessment study (Annex 1)[6]. Statistics show that all Member States have to cope with the consequences of disasters.

Floods (151 between 2000 and 2008) and wind storms (98 between 2000 and 2008) are the most prevalent natural disasters reported. 68 extreme temperature events and 11 earthquakes were reported between 2000 and 2008. Forest fires and other wild fires are a recurrent phenomenon: the occurrence of such fires varies from year to year in intensity and in geographical location.

Regarding the frequency of disasters, data on disaster occurrence and their physical and economic impact remains indicative at best. It is however possible to distinguish between:

– Disasters that happen in one or more countries and have no direct spill-over effect, such as forest fires, earthquakes, or industrial accidents. Such disasters may strike different Member States at different times, but might also happen simultaneously and become a transnational concern. For example, the forest fires in Portugal in 2003 and 2005 demonstrated the need for further collaboration between countries (e.g. on fire suppression, training, and information exchange). It should be borne in mind that

---

5 The Centre for Research on the Epidemiology of Disasters (CRED) defines a disaster as "a situation or event which overwhelms local capacity, necessitating a request to a national or international level for external assistance; an unforeseen and often sudden event that causes great damage, destruction and human suffering".

6 Disasters reported in the EM-DAT database maintained by CRED (Collaborating Centre for Research on the Epidemiology of Disasters)

large national disasters with no direct physical spill-over effect on other Member States may nevertheless produce significant negative impacts on national socio-economic or structural conditions, ultimately requiring EU intervention, not only through the Solidarity Fund but also to restore the general socio-economic situation indirectly affected by the disaster.

– Disasters with clear spill-over effects for several countries, such as floods, wind storms, or tsunamis. For example, record-breaking rainfall amounts and intensities were observed in central Europe during the first half of August 2002: the Vltava submerged parts of the city of Prague, the Elbe flooded parts of Dresden. Parts of the Danube catchment were also affected by severe flooding.

Disasters are increasing in frequency and magnitude

Annex 1 gives detailed information on disasters in EU-27 between 2000 and 2007 reported in the Emergency Database of Disasters (EMDAT database).

During this period the 494 disasters experienced by the EU-27[7] killed 79 342 people and had a total cost of €103 billion. The majority of deaths occurred in Member States affected by extreme temperatures, in particular during the 2003 summer, while floods caused most of the economic costs, in particular in 2000, 2002 and 2007.

As illustrated in the following graphs, disasters are increasing both in frequency and magnitude. Globally, since 1975, the number of natural disasters has increased from around 75 to more than 400 a year. This is almost entirely caused by an increase in weather-related disasters: over the last three years hydro-meteorological disasters increased by more than 100%, from about 100 in 2004 to more than 200 in 2006[8].In the EU-27, over the 1990-2007 period, there was a dramatic trend of increasing number and severity of both natural and man-made disasters, with a steeper increase in natural disasters. In the EU-27, the number of natural disasters reported increased from 43 in 1974-1978 to 288 in 1999-2003[9].

Natural disasters inflict considerable damage and costs

The reported cost of estimated damages[10] from disasters in the EU-27 between 1974 and 1978 was 16 042 million USD[11]. For the 1999-2003 period the reported total damage was 52 153 million USD[12], more than a threefold increase. This relative increase is higher than that experienced by the global damage costs, that only doubled in the same period from 108 200 million USD[13] (1974-1978) to 216 962 million USD[14] (1999-2003)CRED (2004) Thirty years

---

7 For a disaster to be entered into the database, at least one of the following criteria must be fulfilled : 10 or more people killed, 100 or more people affected, declaration of a state of emergency, call for international assistance

8 EMDAT database

9 EMDAT database

10 Since there is no standard procedure to determine a global figure for economic impact, several institutions have developed methodologies to quantify these losses in their specific domain. See http://www.emdat.be/ExplanatoryNotes/explanotes.html.

11 Costs in USD at 2003 value. The equivalent amount in Euros, estimated on the basis of the exchange rate applied on the 2nd January 2003 by the European Central bank, is € 16,757 million.

12 Approximately € 54,479 million using the mentioned exchange rate

13 Approximately € 113,000 million (2003 exchange)

14 Approximately € 227,000 million (2003 exchange)

of natural disasters 1974-2003. Presently, the economic cost of disasters in Europe is estimated at 15 billion Euros yearly[15].

Insurance companies are directly affected: in 2004 natural events caused indemnity payments of over €1.6 billion, according to reports from national insurance organisations to the Insurers of Europe (CEA, 2006)[16]. It has to be borne in mind that the cost to society is considerably higher than the cost to the insurance companies. Because of certain assets not being covered by insurance, total damage is thus greater than insured damage[17].

Indirect costs resulting from disasters can also affect the financial markets, in particular credit ratings and interest rates. Increases in financial cost (cost of capital and increased risk premiums) may also affect the competitiveness of European business. In addition, the cost of a disaster and the risk of future disasters must be spread amongst stakeholders. Within the European Union the insurance coverage for e.g. storms and flooding differs greatly, with the state providing guarantees in some countries and not in others. This affects the risk borne by the insurance company, as well as risk premiums.

Disasters are increasingly causing transboundary impacts

Disasters do not recognise borders, and some disasters are increasingly having transboundary impacts linked in particular to the infrastructural interconnections between Member States. For example the Baia Mare spill of cyanide, in north-west Romania, in 2000, lead to water contamination through drainage systems reaching several large international rivers before eventually reaching the Black Sea. Other examples in 2002 were the devastating floods along the Danube and Elbe rivers in Central Europe, flooding in Southern France, and the Prestige oil spill[18]. Other types of accidents may have transboundary impacts, such as the forest fires of the summer of 2007.

An adverse event affecting a single EU Member State or a small group of Member States can have an impact in terms of compensation requested through the Solidarity Fund, but also has a general impact on its sustainable socio-economic development and on EU cohesion, potentially increasing its general financing needs with regard to the national and the EU budget.

The cross-border dimension has to be taken into consideration, as different protection levels for citizens in the different Member States or regions may imply a different level of vulnerability for similar events, implying increased costs and damages.

A growing demand for the civil protection Mechanism

---

15 ABI (2005) and Munich Re (2008).

16 This number only includes reports from the countries that supplied information to the CEA. The indemnity on European level is thus considerably higher than estimated here.

17 This was the case with the winter storm Gerda in January 2004. The insured damage was worth €80.5 million, whereas the total damage was estimated to be €104.7 million (CEA 2006).

18 Mapping the impact of recent natural disasters and technological accidents in Europe, European Environment Agency, Copenhagen 2003.

The Community Mechanism for civil protection is increasingly recognised by European and international actors, as illustrated by the following graphs. Its main role[19] is to facilitate co-operation on civil protection assistance in the event of major emergencies requiring a rapid response. Investment in disaster preparedness and response can provide a short-term solution to immediate risks, and is often an essential element to ensure the safety of populations. However, particularly in the case of recurrent disasters, the cost of response can turn out to be relatively heavy in the long term, not only for the country affected but also in terms of external solidarity.

3.1.2. A wide range of affected actors

Vulnerability to natural and man-made disasters is increasing, due to increasingly intensive land use, industrial development, urban expansion and infrastructure construction, and to climate change.

The vulnerability to natural or man-made disasters is often the result of multiple risks. The impact of natural hazards may be aggravated by factors linked to human activity (e.g. floods vs water basin planning, intensive socio-economic investment in risk-prone areas, inadequate technical standards for construction in risk-prone areas). Conversely, technological risks can be aggravated by natural conditions, with technological impacts adding to natural impacts (earthquake causing damage to structures containing dangerous substances).

All EU inhabitants may be affected or suffer from the impacts of disasters in various ways: damage to human health and casualties, damage to the environment, direct or indirect damage to economic assets, private property, or infrastructure. Depending on the type of disaster, direct impacts may also affect public administration, in particular its organisational model, the funding mechanisms, the information and communication procedures. Sudden disasters are likely to affect all sectors (economic sectors, public administration, civil society).

The potential impact of a disaster varies within the EU, depending on the vulnerability and resilience of the Member States. The impact of the different disasters on the population also varies depending on the type of disaster. In the EU, disasters caused by extreme temperatures have led to over 75 000 casualties since 2000, representing 95% of all deaths caused by disasters. 76% of these deaths occurred in France, Italy and Spain. Flooding, which killed 524 people in 2000-2008, is more widespread and has high economic impacts. Vulnerability to floods appears to be particularly high in Romania (38% of the deaths) followed by Italy (15%) and Bulgaria (15%).

3.2. A fragmented approach to disaster mitigation

Prevention is an integral part of the disaster management cycle. The impacts of disasters may be reduced by measures aiming at preventing the disasters and their impacts, enhancing preparedness and response, and ensuring effective recovery/reconstruction. Furthermore, potential measures in these areas require a range of instruments, which may fall within the competence of different ministries and involve a diversity of private and public actors.

---

[19] Council Decision 2001/792 of 23 October 2001, recast by Council Decision 2007/779 of 8 November 2007.

For these reasons, in the Communication COM(2008)130 on reinforcing the Union's disaster response capacity to take an integrated approach to disasters, the Commission proposed encompassing all phases, embracing all tools and instruments, and addressing all categories of disasters. Stakeholder consultations have also highlighted the fact that emergency planning is often technically and administratively disconnected from spatial planning, and can hinder or delay response.

3.2.1. Current situation at EU level

Currently, the approach to disaster prevention is fragmented. The EU has adopted directives on flooding and on industrial accidents (Seveso Directive) but has not addressed other types of disasters such as earthquakes, storms or forest fires. Furthermore, disaster prevention projects may be eligible for financing under various financial instruments which could be better coordinated. Finally, policies affecting land planning, such as environmental, agricultural, transport, energy and regional policies, could be better coordinated with regard to disaster prevention.

3.2.2. Current situation in Member States

Preventive action is often fragmented

In Member States, the approach to disaster prevention is also fragmented[20]. However, recent trends in most Member States lean towards increased integration and coordination between actors and policies involved in disaster prevention. Preventive action tends to be taken in the wake of a disaster and concentrate on a particular type of disaster. Nevertheless, Member States find that it can be difficult to maintain long-term political momentum and corresponding budget allocations as time elapses from the particular disaster that caused political attention.

The drivers of a prevention policy differ between Member States

Member States have developed effective and well-coordinated mechanisms for crisis management for a long time. Disaster prevention as a discipline in its own right, however, is a new area. This is also reflected in the fact that the concept of prevention is not defined in a unique manner, neither across countries nor within a specific country.

The main drive behind the development of prevention approaches is to be found in the obligations stemming from EU legislation and international commitments in general, and in the understanding that the overall risk picture is changing. For instance, in Sweden, the wind storms in 2003 were the main reason for the implementation of a new legislation concerning the prevention of accidents in 2004. In France, the heat wave in 2003 was the starting point for a national heat disaster prevention plan. In Romania, the water directive has lead to the development of risk maps. The Netherlands and the UK suffered great damage and loss of life in 1953 due to catastrophic coastal flooding[21] which had an impact on the development of prevention policies. In the UK, an early-warning system warns people in vulnerable areas at least two hours before the flooding occurs; in the Netherlands, flood barriers have been developed.

---

[20] Member States' approaches towards prevention policy — a critical analysis.

[21] The Thames Estuary Partnership Web 2008 a, and Olsthoorn & Tol 2001.

A gradual loss of prevention culture at individual level

In Member States, early warning systems and risk mapping are integral aspects of civil protection and widely acknowledged as important tools in prevention. Case studies[22] seem to indicate that the new Member States and Member States with high risk exposure relative to their economic capabilities are positive towards strong joint efforts and obligations.

On the other hand, the same studies show a loss of prevention culture at the individual level. Somehow, prevention seems to be perceived by the citizen as a societal responsibility at the expense of individual precautions: citizens, industries and other actors might therefore be reluctant to take appropriate prevention measures proactively. Prevention at the individual level also depends on insurance policy: in some Member States the insurance system is compulsory, solidarity-based and guaranteed by the State. This implies that all property owners are covered, no matter what their financial situation is. In some cases insurance is combined with spatial planning, whereby insurance entitlement depends on compliance with regulations governing identified risk zones. In such cases the main challenge seems to be enforcement and control.

All Member States provide incentives for better individual prevention behaviour through awareness building and educational efforts. Some involve local communities in the framing of plans and actions, or perform information campaigns.

The organisational structure of Member States has an impact on their prevention policy.

The internal administrative structure within Member States also determines the way in which prevention measures are designed and implemented. While some Member States have a highly centralised structure, others see decentralised organisation as a strategic approach to disaster prevention. For instance, while in a country like France prevention responsibilities are concentrated at the national level, in others such as Portugal and Sweden they are devolved to the regional and local levels. The understanding here is that knowledge of local conditions and a cross-sectoral approach at the local level are a strength.

3.3. Specific problems

The preparatory work and the consultations of the Member States and stakeholders have lead to the identification of four specific problems which are discussed in this section:

– the lack of a consistent knowledge base;

– limited or non-existent links amongst the various actors and policy areas;

– EU funds could better contribute to disaster prevention;

– the lack of prevention measures regarding certain specific disasters.

[22] Member States approaches towards prevention policy — a critical analysis.

3.3.1. The lack of a consistent knowledge base

Recent research has shown that "an adequate and consistent normative framework is essential to implement risk management"[23]. For instance, "the lack of, and need for, a global statistical fire database, by which the economic and ecologic impact of fires could be spatially and temporarily quantified, was identified"[24].

Currently, data and information on occurrences, risks, consequences and costs of disasters, their wider impacts and the relevant policy responses, are at best indicative. They are not systematically made available or shared at EU level, leading to inequalities and loss of cohesion between disaster-prone regions. Furthermore, the basic information on risks of disasters is being developed via a variety of methodologies which may generate inconsistencies and lack of comparability, potentially resulting in divergent awareness and protection levels. There is no cross-cutting coordination mechanism to ensure dissemination of best practices or an enhanced focus on applied research.

The intersection between policy needs and scientific/technical data, the links between vulnerability assessment and legislation are not always clearly identified or transparent. The evaluation of risk and risk acceptance levels for policy-makers, professionals and citizens may be prejudiced by incomplete, ambiguous or excessively complicated information, resulting in unrealistic risk perceptions.

3.3.2. Limited or non-existent links amongst the various actors and policy areas

Existing EU action relating directly or indirectly to the prevention of disasters has been developed specifically to address well defined issues such as floods or technological disasters (e.g. SEVESO). Coordination is needed to define priorities and organise mutual synergies.

Furthermore, measures taken in the management disaster cycle (prevention, preparedness, response, recovery) could be better coordinated. This is generally acknowledged to be the necessary consequence of the fact that disasters may touch upon numerous policy areas and involve a variety of actors.

For example, urban planning and emergency planning criteria are often established and monitored by different administrations at different levels, often without any mutual information or consultation. Prevention rarely features in emergency exercises and simulations. There is also potential for reinforcing the links between actors subject to the SEVESO Directive such as the chemical industry, emergency planning experts, or land-use planning experts.

Nevertheless, the studies conducted in some Member States[25] (Romania, France, Sweden, Portugal) showed that in some Member States, links are being developed between public institutions. For example, the Swedish Rescue Services Agency was chosen as one of the main institutions to implement the EU SEVESO Directive in order to take advantage of an

---

[23] A new pattern of risk management: the Hyogo framework for action and Italian practise. Marialuce Stanganelli .Department of Urban and Regional Planning and Earth Sciences, University of Napoli, 2007.

[24] Fire Management Working Paper FM 18 E, FAO 2006.

[25] Member States' approaches towards prevention policy — a critical analysis.

organisation with cross-cutting structures. In France, following the heat wave of 2003, a heat wave prevention plan involving various administrations has been developed.

3.3.3. EU funds could better contribute to disaster prevention

Existing funding sources include the financing of preventive action from private and public sources, from Member States and from the EU. The funding possibilities are substantial: there is therefore no general scarcity of funding.

Private sector investment focuses on specific projects rather than comprehensive industry or cross-industry initiatives. According to various studies[26], four main industries are the most active in prevention investments: insurers and reinsurers, engineering and construction, information communication technology and telecoms, and utilities and transportation. At national level, the main source of assistance comes from public funds, in particular to compensate for damage and losses due to extreme weather events in the most affected weaker regions. At EU level, a number of EU financial mechanisms exist that may specifically support prevention, but these are in some cases limited in resources, e.g. LIFE+ and the Civil Protection Financial Instrument.

The annual budget of LIFE+ in 2008 totals nearly 250 Mil €, distributed between three wide thematic areas. In this framework, prevention refers specifically to two topics only: forest fires and waste. The scope of LIFE+ with regard to forest fire prevention and suppression is limited to information and communication action within the EU, such as training for agents involved in forest fire prevention and awareness raising campaigns for rural populations affected by forest and woodland fires.

The Civil Protection Financial Instrument (20 Mil € in 2008) virtually covers the whole spectrum of possible disaster prevention measures, defining prevention as "any action that supports Member States in preventing risk or reducing harm to people, the environment or property resulting from emergencies." In 2008, an amount of 1.1 Mil € has been earmarked for a call for proposals for prevention projects.

The funding possibilities through Structural Funds and Cohesion Policy are substantial and are programmed by the Member States. The Convergence objective under the Regional Development Fund, in particular, specifically includes risk prevention. However, Structural and Cohesion financial coverage is frequently limited to certain groups of member States and does not necessarily cover risks arising from non-structural factors.

The exploratory studies carried out in four member States prior to the present Impact Assessment, as well as the stakeholder consultation, have highlighted the wish both from the administration and business for strategic guidance on how to set priorities in the field of prevention and for a single entry point for providing information and advice on disaster prevention measures and funding sources.

---

[26] Building resilience to natural disasters: a framework for private sector engagement, World Economic Forum, January 2008.

3.3.4. The lack of prevention measures for specific disasters

Certain disasters have been addressed at the EU level, for example flooding and technological accidents. These examples show that vertical policies can obtain results, including accelerating efforts and easing the planning and implementation of policies and actions.

Other important disasters have not been specifically addressed. In particular, building on existing measures taken at EU and national level, there is a need to explore whether a more comprehensive EU approach to the prevention of forest fires could be implemented. Forest fires are one of the most frequent disasters in the EU, and for which experience shows that the EU may provide useful support and complement national policies. The issue of forest and other wild fires therefore requires comprehensive scientific knowledge and policies covering and linking prevention, preparedness, response and recovery.

3.4. Expected evolution of these problems

The frequency of natural disasters is expected to increase, as emphasised by the Commission in the Green Paper on adaptation to climate change.

According to the EEA[27] "warm periods, including heat waves, are expected to be more intense, more frequent and longer-lasting". According to the IPCC report[28] "climate-related hazards will mostly increase". In particular "winter floods are likely to increase in maritime regions and flash floods are likely to increase throughout Europe", "catastrophic fires are expected on drained peatlands in central Europe". As human activity and settlements make land use more intensive, man-made risks are likely to increase.

This may be somewhat mitigated as the Member States are, at different levels and to different degrees, taking steps towards disaster prevention, for example in the area of risk mapping. However, the development of different approaches by Member States will also have adverse effects, notably in terms of increased difficulties in building synergies between national approaches and developing a consistent knowledge base on disasters.

3.5. The grounds for EU action

Disaster prevention actions are a transnational issue

Although there are differences in vulnerability to different types of disasters among the Member States, disaster prevention is a transnational issue.

One can distinguish between:

– **actions on disasters occurring in one country, with no spill-over effects, but which may deserve Community action in terms of solidarity;**

In many cases disasters only affect one Member State or specific regions of one Member State. For instance, most of western Europe suffers relatively few significant landslides[29]. By

---

27 EEA (2007): Europe's Environment, the fourth assessment.

28 IPCC Fourth Assessment Report Working Group II Report "Impacts, adaptation, and vulnerability".

29 Mapping the impacts of recent natural disasters and technological incidents in Europe, European Environment Agency report, 2003.

contrast, the Mediterranean basin (e.g. southern Italy and the eastern Iberian Peninsula) and the mountain regions of central and eastern Europe are particularly vulnerable to these events. The vulnerability increases if urbanisation and poor forest management are present.

– **action on disasters with spill-over effects in several countries;**

The large river systems of western, central and eastern Europe, as well as the smaller streams of the Mediterranean, make these areas vulnerable to flooding. Similarly, southern Europe is prone to drought, the Mediterranean and eastern Europe to forest fires, western Europe and the British Isles to storms, mountain areas such as the Alps, the Pyrenees and the Carpathians to avalanches and specific areas such as the central and eastern Mediterranean to earthquakes and volcanic eruptions.

Major disasters, notably disasters related to extreme weather conditions such as flooding or forest fires, tend to affect several Member States at the same time or over a limited span of time. For example, the 2002 floods inflicted significant damage to regions in the Czech Republic, Slovakia, Italy, Spain, Germany, Romania, Bulgaria, Croatia, and Hungary. The 2007 forest fires burnt large areas in Bulgaria, Greece, Italy, and Spain, whilst the 2003 forest fires hit Portugal, Spain, France and Italy. Moreover, with a changing climate there are indications that the risk of weather-related disasters is becoming less specific to particular geographical areas.

– **other measures**

Much of disaster risk prevention draws on a common set of methodologies, instruments and tools, such as risk identification, mapping and assessment. These non disaster-specific aspects concern all EU Member States.

Equivalent safety and protection across the EU

All EU citizens are entitled to an equivalent level of safety and protection on the territory of the EU.

Lack of Community action would damage the interests of Member States.

The increasing number of severe disasters across the EU does not only have a local dimension. The accumulation of impacts may affect economic growth of the EU as a whole.

EU citizens expect the EU to act

According to a special Eurobarometer report published in March 2008[30], Europeans attach an overwhelming importance to protecting the environment. 78% of respondents indicated that environmental problems have a direct effect on their daily lives.

Cost of inaction

A recent OECD study[31] points to the fact that while the economic risks associated with natural disasters (e.g. floods, hurricanes) can only be partly reduced through public policy

[30] "Attitudes of European citizens towards the environment", Special Eurobarometer 295/ Wave 68.2 — *TNS Opinion & Social, European Commission, March 2008.*

measures (e.g. mitigation of climate change, flood prevention measures), the cost of inaction in these areas can also be considerable.

The OECD study also states that environment-related industrial hazards such as oil spills and land contamination are already generating significant costs of inaction. For example, experience in Europe and US indicates that the cost of cleaning up or restoring damaged ecosystems after industrial accidents can be billions of Euros. Moreover, due to the irreversible nature of some of the associated impacts, the real losses to society will be higher than these direct financial costs (no matter how comprehensive the remediation efforts may be).

It can also be inferred that, in quantitative terms, economic losses from natural disasters are likely to be proportional to the affected country's GDP. However, the qualitative impact of natural disasters is likely to be more devastating for the poor (low-GDP EU Member States or low-income groups of citizens in any EU Member State). Therefore, in the absence of prevention measures within the EU:

– rich Member States would tend to suffer higher economic losses in strict economic terms, partly because of the concentration of crucial assets;

– poorer Member States or population groups would be more severely impacted and thwarted in fulfilling their economic potential, thus countering the effects of cohesion policies.

EU Institutions call for EU action on prevention of disasters.

The EESC has welcomed[32] the future Commission initiative on prevention.

The conclusions of the European Council meeting of 19-20 June stated that: "§24. The European Council welcomes ongoing efforts to reinforce the Union's disaster-management capacities and stresses the need for a coordinated approach to managing disasters. It invites the Council, the Commission and Member States to take this work forward rapidly."

On 16 June GAERC adopted conclusions on the Commission Communication on reinforcing the Union's disaster response capacity. Regarding disaster prevention, the Council emphasised the need for a balanced approach guided by two principles: national responsibility, whereby each Member State takes appropriate preventive and operational measures for the protection and safety of people, the environment and property; and EU solidarity, which is the basis for the provision of assistance rendered on request to Member States and third countries and their people, when affected by a disaster that exceeds their response capacity.

At the June 19th plenary session, the European Parliament adopted a Resolution[33] on the Union's disaster response capacity. Regarding prevention, Parliament in particular urged the Commission to submit a package of legally binding instruments (e.g. a framework directive) with a view to filling in gaps in existing EU legislation, policies and programmes as regards

---

31 Cost of Inaction on Environmental Policy Changes, Summary Report ENV/EPOC (2007)16 Final.

32 EESC Opinion "Improving the civil protection Mechanism — a response to natural disasters" (2008/03/13).

33 European Parliament Resolution of 19 June 2008 on stepping up the Union's disaster response capacity.

disaster prevention and response. It recommended that such a comprehensive framework should comprise three pillars, with a view to stepping up prevention under existing EU mechanisms and Member State approaches, developing a new framework approach on disaster prevention, and supporting further development of prevention knowledge and technology through EU research and development programmes.

4. OBJECTIVES

Member States already have, to varying degrees, policies aimed at the prevention of disasters. Action at Community level should therefore complement national actions and focus on areas where a common approach is more effective than separate national approaches.

The overall objective of the Communication is to identify measures which could be included in a Community strategy on disaster prevention that would bridge the existing gaps, link various sectors and initiatives and be the overall policy framework for initialising sector specific and/or thematic initiatives, horizontal and cross cutting tools and guidelines for disaster prevention in EU-27. On this basis, existing thematic or sectoral initiatives should be complemented and gaps should be filled to adapt the existing policy framework to the overall approach to the prevention of disasters.

This overall aim is expected to be achieved through the following specific objectives:

– build a consistent knowledge base on disasters;

– link the various actors and policies;

– improve the use of EU funds for preventing disasters;

– better target specific risks

Without duplicating existing policies at EU and national level, the initiative will cover both natural and man-made disasters. The implementation of the first three objectives will have an impact on disasters as a whole and will not distinguish between natural and man-made disasters, as natural hazards can lead to disastrous natural events which may also have technological impacts (power failures linked to floods and fires, chemical pollution linked to earthquake damage). The fourth objective will nevertheless distinguish clearly between natural and man-made disasters as it is aimed at targeting specific risks, and devoting specific instruments to them.

4.1. Build a consistent knowledge base on disasters

There is a need for a systematic exchange of information and experience and to develop common methodologies for the collection of data on disasters, its analysis and interpretation, drawing *inter alia* on information and communication technologies. This would make the aggregation of data and information possible and thereby facilitate a more general analysis of issues related to disasters. Furthermore, a pooling of information and experience could ease the work and save time and resources that are needed for implementing disaster prevention in the EU. It would also improve the basis on which to perform assessments of effects of disasters and cost-benefit assessments of disaster prevention measures.

4.2. Link the various actors and sectoral policies throughout the disaster management cycle

It is necessary to make all existing policies work in a direction which is on the one hand not detrimental to disaster prevention efforts and, on the other hand, can support and accelerate such efforts. This requires linking sectoral policies to provide a basis for an overall approach and coordinating measures taken regarding the disaster management cycle (prevention, preparedness, response, recovery).

4.3. Improve the use of EU funds for preventing disasters

Currently, a number of EU funds may provide support to projects and programmes including the prevention of disasters. There is a need for better targeting of such funding and for more immediate links between the funded actions and the prevention of disasters.

4.4. Better target specific risks, building on existing initiatives

A number of EU legal instruments already exist today, and new initiatives are expected. Building on existing initiatives, gaps should be filled to target specific risks.

5. OPTIONS

This chapter outlines the options available.

Firstly, the baseline described in section 5.1. characterises a situation where no further EU action is taken regarding the prevention of disasters. This option and its assessment later in this report aim at informing the policy decision on whether or not to develop an EU strategy on disaster prevention.

Secondly, sections 5.2 to 5.5 describe the various options available in the four areas of action identified in chapter 4. These are not mutually exclusive unless otherwise indicated. It should be noted that these options embrace a range of levels of ambition.

5.1. Baseline: no further EU action on the prevention of disasters

The baseline for no further EU action option can be described as one where:

– Member States progress at a different pace and with different levels of ambition with regard to developing consistent, comprehensive and operational strategies and plans for disaster prevention;

– Vertical gaps in terms of insufficient or non-existent prevention plans may subsist in certain sectors, but not in others, or in some countries;

– There is a tendency for a reactive approach to dominate;

– No effort is made on the comparability of tools and measures such as risk mapping and vulnerability assessments.

5.2. Build a consistent knowledge base on disasters

Specific objectives for building a consistent knowledge base on disasters include:

- **An initiative on risk mapping**

Community action in the field of risk mapping can add value by contributing to an equal level of safety and protection throughout the Community.

In this context, possible options, not mutually exclusive, could include:

– developing general principles and minimum prevention guidelines. EU guidelines could be based on Member States' best practices regarding vulnerability assessments and the use of risk maps. The role of the private sector in this field (insurance companies) should also be considered. As a first step, the Community guidelines could focus on disasters causing potential transboundary consequences;

– fostering cooperation between Member States in developing a common approach for analysing the potential vulnerability of defined geographical areas;

– EU legislation aimed at defining the methodologies for risk identification, evaluation and mapping by the Member States as well as a timetable for creating and updating risk maps. The general purpose of risk maps would be to plan effective preventive action in areas prone to natural and man-made disasters in Europe and the prioritisation of risks for which preventive action should be taken according to national norms.

- **A disaster observatory**

This would compile existing data and information on disasters in the EU. It would also identify comparability issues and data/information gaps, propose common methodologies and undertake projects together with concerned parties. Where relevant, it would work closely with the environmental data centres established by Eurostat, the joint Research Centre and the European Environment Agency. It would also work closely with other exchange platforms related to disasters, such as the European Forest Information System EFFIS, the European Flood Alert System EFAS, the European Community Urgent Radiological Information Exchange ECURIE, the Natural and Environmental Disaster Information Exchange System NEDIES and the European Droughts Observatory currently being established by the European Commission. It would also provide input for continuing research and pilot validation on prevention of disasters through the framework programme for research and technological development.

One of the objectives of the disaster observatory would be to collect, store, and assess guidelines, best practices, and disaster case histories and to facilitate exchange of information. It would promote a series of studies on lessons learnt in Member States — from emergency action after accidents and disasters to drafting guidelines on information to be communicated to the public — including the private sector — on major hazards.

Action in this field should be in line with SEIS principles[34] and build upon the implementation of the INSPIRE Directive and further development of the GMES initiative, as a basis for improving respectively the sharing of disaster-related data and information within Europe and the provision of services to public policy-makers and citizens.

- **The launching of projects under the Civil Protection Financial Instrument**

Projects on the development of common methodologies for data acquisition and information generation on disasters in the EU could provide guidance to the Member States.

5.3. Improved linking between actors and sectoral policies throughout the disaster management cycle

Non mutually exclusive specific options for linking the various actors and sectoral policies include:

- **Developing best practices and guidelines involving prevention aspects**

Lessons learnt during assessments carried out in cooperation with Member States after emergencies, currently focusing on preparedness and response aspects, could include a prevention dimension.

- **A multisectoral steering group**

The Commission would set up a steering group comprising representatives of the various sectors concerned and applying an open method of coordination. The group would identify needs regarding the linkage of policies throughout the disaster management cycle, recommend actions to be taken at national and EU level to enhance the links between the relevant policies at national and EU levels, and monitor the implementation of the recommendations. Its activities could also include the follow-up of other options such as the activities of the disaster observatory (section 5.2.) or the development and implementation of guidance on the use of EU funds (section 5.4.). The steering group might also draw up guidelines and recommendations on more technical areas (e.g. content of a disaster prevention report, guidelines for risk mapping, recommendations for research and funding). It would build upon existing initiatives at Community level[35]

5.4. Improve the use of EU funds for preventing disasters

Specific options to improve the use of EU funds for preventing disasters include:

– **Specific funding:** a specific disaster prevention financial instrument would be created to finance national initiatives for preventing disasters. It would be multisectoral in nature.

---

34 Communication “Towards a shared environmental information system”(SEIS) COM(2008)46 final.

35 In this context the Commission's 'Regions for economic change' initiative[35] (COM(2006)675) already offers a framework for the development of such platforms. Within its thirty priority themes, three are focused on risk prevention and provide an opportunity for regions across Europe to exchange experience and spread good practice.

– **Guidance on use of funds**: the Commission would develop in cooperation with the experts of the Member States guidance on the use of EU funds for preventing disasters. This would include mapping EU instruments capable of fund disaster prevention activities, recommendations on the use of the funds, and a catalogue of prevention measures to be considered by the Member States for funding by the EU in the light of their national conditions. The Commission would use these guidelines to assess and report on the relevant EU expenditure.

– **Enhancing prevention provisions in EU funding instruments:** in the review cycles of EU funds, provisions would be added to the legal bases of the funds on a programming of measures on disaster prevention to be financed by the funds.

Specific funding radically differs from the other two options and could not be combined with these.

5.5. Better target specific risks building on existing initiatives

Specific sectoral prevention initiatives may be required using *inter alia* the experience acquired in the implementation of relevant Directives such as the Floods and the SEVESO Directive. Non mutually exclusive specific options for reviewing and complementing existing initiatives include:

- **Improving the targeting of prevention in existing EU instruments**

This option would consist of a screening of existing instruments to identify ways of improving the targeting of disaster prevention in national and EU policies. The identified improvements would be integrated into the issues considered in the review cycles of the instruments concerned. For example, the review cycle of the Environmental Impact Assessment Directive, as amended,[36] could potentially examine whether the environmental impact assessment of individual projects sufficiently addresses the direct and indirect effects on disaster risk prevention. The review of EU legislation on major industrial accidents could assess the effectiveness of the provisions of the SEVESO Directive in relation to prevention in the context of the ongoing review of the Directive.

- **Complementing existing sectoral initiatives with other specific initiatives, such as an EU initiative on forest fires**

Certain disasters have not yet been addressed at EU level. In particular, building on existing measures, there is a need to explore whether a more comprehensive EU approach to the prevention of forest fires could be implemented.

An EU initiative (such as a directive) on forest fires and other wild fires would therefore have the objectives to cover *inter alia* requirements for:

– risk mapping and risk analysis to allow for prioritised prevention work;

[36] OJ L 175, 5.7.1985, p. 40-48.

– preventive measures for the Member States to consider in their national prevention strategies, including awareness raising, involvement of private and public actors, dialogue with citizens;

– a common, reliable statistical fire database[37].

- **Developing framework legislation on prevention**

This would provide an overall framework for prevention and include provisions for building the necessary links at national level between the relevant services and instruments. The objective would be to formulate a comprehensive prevention approach that would complement and give coherence to the existing sectoral and vertical approaches and reinforce the added value of existing Community action. The aim would be to create synergies between existing instruments and to strengthen coordination and consistency between them. It would provide a framework for risk mapping and for devising national risk prevention strategies. This would be complemented by a common knowledge base and targeted funding as well as guidelines for developing national risk prevention strategies.

6. IMPACT ASSESSMENT OF THE OPTIONS

This section provides an impact assessment that is consistent with the current stage of development of a comprehensive Community policy on the prevention of disasters. Firstly, it focuses on the possible impacts of EU action or inaction. This is intended to inform the basic policy decision whether or not to develop an EU strategy on disaster prevention. Secondly, it analyses the impacts of the various options for Community action in the four areas identified in chapter 2. This aims at informing a first round of policy discussion between the EU institutions on a wide range of options that could be further explored and assessed for potential inclusion into such a strategy.

6.1. Baseline: no further EU action on the prevention of disasters

The future situation with no further EU policies in this area may be one where:

– citizens, the environment and economic assets may experience different prevention levels implying different levels of protection within the EU when comparing regions with comparable disaster risks;

– the costs of developing preventive strategies and action in Member States may be higher than expected in light of the probable insufficient level of, for example, experience sharing and knowledge sharing and joint knowledge building;

– the efficiency of prevention strategies may suffer from an insufficient level of comparability as regards background information — across regions that share risks or affect each others' risk patterns;

[37] building on existing initiatives such as the European Forest Fire Information System EFFIS

– the cost efficiency of dealing with disasters will be far from optimised, and once disasters strike, the costs will need to be covered anyway, implying also a high potential pressure on the EC response mechanisms and the Solidarity Fund;

– finally, the level of disaster prevention and/or the reduction of the effects of disasters may be lower than expected. In such a case only a fraction of the potential benefits summarised in Annex 3, table 6.1 would be achieved

Various studies show that the damage and costs caused by natural and man-made disasters could have been avoided by better prevention measures.

According to the OECD[38], given that remediation, restoration, and reconstruction costs are likely to be considerable (and that damages can be irreversible), there is a strong case for ex ante "prevention". The introduction of measures which reduce the frequency and severity of environment-related industrial accidents and natural disasters will often be less than the costs of restoration. The World Bank and the US Geological Survey have estimated that the world-wide economic losses from natural disasters in the 1990s could have been reduced by USD 280 billion, if USD 40 billion had been invested in disaster preparedness, mitigation and prevention strategies (World Bank, 2004).

According to the UK Environmental Agency the value of prevention is also significant in so far as "for every £1 further we can spend, we would be able to save the country £6 in repair costs"[39].

Similarly, recovery costs can be extremely high since they not only include the expenses related to the re-establishment of conditions that existed prior to the disaster, but also cover costs deriving from the disruption of economic and social activity and loss of momentum caused by the disaster, part of which is anyway difficult to quantify in monetary terms.

6.2. Build a consistent knowledge base on disasters

6.2.1. Initiative on risk mapping

Existing situation

Today, almost all Member States do risk mapping to some extent for selected disaster types. In particular, all EU Member States have to develop flood hazard and flood risk maps by 2013 under the EU Flooding Directive.

The EU Flooding Directive (2007/60/EC) operates with a definition of both flood hazard maps and risk maps as tools for planning and communication, using a stepwise approach.

According to the Directive, flood hazard maps should cover geographical areas which could be flooded. Flood risk maps should show the potential adverse consequences associated with flood scenarios. Member States are required to develop their hazard maps and risk maps by December 2013. Flood hazard maps, risk maps, and flood management plans should all be made available to the public, in order to increase public awareness, support the process of

[38] Costs of inaction on environmental policy challenges: summary report (ENV/EPOC(2007)16/final).

[39] Mark Tinnion, regional flood risk manager, Environment Agency, cited in ABI 2007.

prioritising, justifying and targeting investments, and support spatial planning and investment plans.

In the private sector, the insurance and reinsurance companies generally use risk maps as a tool for assessing risks, identifying risks and risk zones and for assessing potential losses. In general, the insurance maps use information from public sources. Some EU countries, e.g. Austria, have set up a private public partnership on flood risk zoning and mapping with the participation of the insurance industry and public authorities.

Impact on national prevention policies

Systematic pooling of information through risk mapping would contribute significantly to a stronger empirically founded knowledge base. It would generate vulnerability and risk assessments aimed at increasing public awareness, supporting the process of prioritising, justifying and targeting the investments and developing sustainable policies and strategies.

This option would require extensive studies for defining the appropriate methodologies. Whilst on the one hand, it would guarantee a homogeneous approach by the Member States and excellent quality of data and information, on the other hand, it requires investments at EU and national level in terms of human and financial resources. At national level, new efforts would have to be made for collecting data and possibly for adapting national data collection methods.

It is expected that vulnerability assessments will pinpoint regions and areas that are most likely to be affected by potential disasters, thus providing the means for prioritising and taking appropriate action which is less costly than recovery.

Administrative costs at national level

Risk mapping would have budgetary consequences for public authorities, as they will have to make preliminary risk assessments and prepare risk maps and risk management plans. The costs arising from such obligations would depend on the size and type of the area to be assessed.

The costs of preliminary risk assessment and risk mapping would depend on the information already available. Risk maps would only have to be developed where there are potential or reasonably predictable significant risks. The costs of producing risk maps would depend on the decisions made by the Member States on the scale, level of detail and presentation (paper, electronic, etc).

On a national scale, the cost of producing flood risk maps available to the public on the Internet was EUR 55 million for England and Wales. The cost of risk mapping of the Loire basin was EUR 3 million. For the Rhine region, much information was already available, and as a result, the cost was EUR 0.27 million. The costs of producing flood risk maps under the EU Flood Directive has been estimated at EUR 100 to 350 per km2 of river basin.

Similar costs can be expected for risk maps of other types of risks, depending on the information already available.

Economic impact

Insurance premiums could be affected by more precise information on risks and vulnerability at local levels. This would most likely mean increased premiums in affected or risk areas.

Access to public information on risks would enable the insurance industry to improve their financial risk assessment and may lead to a wider coverage of disaster insurances and increased cost efficiency.

Raised awareness could result in monetary benefits as people aware of a potential risk are inclined to be more receptive to risk warnings and protect themselves and their property accordingly, e.g. by simple risk prevention measures. In this way, the public may become actively involved in the development and implementation of disaster risk prevention measures.

Environmental impact

Negative impacts of disasters on the environment would be reduced. By mapping areas at risk, Member States can prevent future activities that affect the environment or adapt those activities to the risks.

Social impact

Institutions and the public would be better informed about risks, leading to better resilience.

6.2.2. Disaster observatory

Existing situation

Today, all Member States collect data in the field of disaster prevention, depending on the disaster type.

Some Member States have worked specifically in the development of scenarios. In some Member States (e.g. Sweden and Denmark), cross cutting national vulnerability assessments have been conducted with a view to mapping vulnerabilities of society, assessing the resilience of society and the measures put in place in the field of disaster prevention and civil protection[40]. In Portugal, the project "Climate change in Portugal. Scenarios, Impact, and Adaptation measures" has led to work on climate scenarios involving prevention and response issues.

Impact on the development of national prevention policies

The Disaster Observatory would g guarantee smooth and easy access to information for citizens and governments alike. It is a value in itself if Member States and relevant actors in the private sector gain access to the same information sources, because they will be able to pass on information to citizens on the risks in a specific area.

[40] For instance, the report " Sweden facing climate change — threats and opportunities" (Commission on climate and vulnerability, Sweden's Government Official Report, SOU 2007:60) has assessed the impact at regional and local level of global climate change, including an assessment of costs and benefits to be imposed on Swedish society.

The establishment of a common knowledge base would stimulate research and development at national level. Focused coordination of research in the field of disaster prevention would promote greater resource efficiency.

For countries with limited experience in dealing with a specific disaster type (flooding, drought, extreme temperatures etc.), a common knowledge base would facilitate the introduction and dissemination of new preventive measures, methods etc., e.g. through the exchange of best practices. Common knowledge in the field of disaster prevention would also assist in accelerating prevention efforts and reducing vulnerability according to best practice standards throughout the EU.

A potential negative impact is the misuse of information e.g. for criminal purposes rather than for prevention purposes. Another challenge would be for Member States to agree on the appropriate type and amount of information to be provided to citizens in order to avoid - creating an unnecessary and unjustified perception of insecurity.

Administrative costs at EU level

At the EU level, setting up the observatory within existing structures would require specific financial and human resources. The staff of the Observatory would be composed of 2-5 members. A yearly budget of 0.5 to 1.0 million € for specific studies could be covered by the Civil Protection Financial Instrument.

Administrative costs at national level

While the EU intervention would not involve a demand for fundamentally new structures, there may be a need to enhance coordination and cooperation at Member State level.

At Member State level, the need seems to be for a small cross-cutting entity that can draw on existing organisational structures, liaise with the Observatory, and forward data and knowledge to national actors. Depending on the existing structures, the organisational set-up and coordination mechanisms in each Member State would need a single staff member and a very limited yearly budget. It is also inevitable that costs will arise for the identification and comparability of data. These costs will however relate to the initial investments. In the longer term, efficiency gains can be expected, offsetting the initial costs.

Economic impact

The enhanced knowledge base would have an impact on consumer behaviour related to buildings/houses since precise risk information could affect house prices in areas with a medium to high disaster risk profile in terms of flooding or forest fires. The same conclusion would apply to land used for agricultural or industrial production. Insurance premiums could be affected by more precise information on risks and vulnerability at local levels.

The economic impact may also depend on the financial conditions for making the information available for stakeholders: free vs paying information.

Environmental impact

The Disaster Observatory encourages a better coordinated and more integrated approach to prevention, mitigating the negative impacts of disasters on the environment. The coordination

with other EU sectoral policies would not only ensure that risk-related measures do not affect the environment negatively, but also that measures taken have positive effects for the environment.

Social impact

The enhanced knowledge base would impact positively on restoring a strong prevention culture, where citizens take appropriate preventive measures.

6.2.3. Launch projects under the Civil Protection Financial Instrument (CPFI) for the development of common methodologies for data acquisition and information generation on disasters in the EU

This option would imply an increase in the share of CPFI funds utilised for prevention. Given the time necessary to set up and complete such action, this option is likely to generate results slowly, which would limit its benefits during the first years. The impact of project results at national level will also depend on the Member States' willingness to integrate such results into the national frameworks.

In the long run, this should enhance comparability of data for cross-border hazards evaluation and foster cooperation on disaster prevention. Furthermore, it will help to establish European networks of expertise.

6.3. Improved linking of actors and sectoral policies throughout the disaster management cycle

6.3.1. Development of best practices and guidelines involving prevention aspects

The production of such guidance would require human and financial resources at EU level and the participation of Member State and stakeholder experts. However this would represent limited costs. Depending on the interest of the Member States it might significantly improve the lessons learnt after disaster, and the links between prevention, preparedness, and response actors.

6.3.2. Multisectoral steering group

Existing situation

Member States have various forms of cross-cutting committees at national, regional, or local level. The two exploratory studies have however indicated a more widely recognised need for enhanced horizontal coordination and collaboration.

Impact on the development of national prevention policies

Setting up a multisectoral steering group would enhance the links between national services to catalyse national disaster prevention approaches and create links between measures taken in different phases of the disaster management cycle (prevention, preparedness, response and recovery). The steering group would contribute towards strengthening the links between civil protection, on one hand, and environmental management on the other. It might also promote cross-cutting coordination at national level to ensure effective information flows. It can encourage a continuous momentum on disaster prevention policies.

The interaction between different departments would also have beneficial impacts in terms of improved understanding of the issues and options for action regarding the prevention of disasters.

Administrative costs at EU level

At EU level, the setting-up of a steering group and a small secretariat would imply the allocation of financial and human resources. The steering group would be composed of 1-2 employees. A yearly budget of 0.25 to 0.5 million € for conferences and meetings could be covered by the Civil Protection Financial Instrument.

Administrative costs at national level

At Member State level, the setting-up of a steering group will be limited to participation in meetings and conferences and some national communication to national actors. While the EU intervention would not involve a demand for fundamentally new structures, there may be a need to enhance coordination and cooperation at Member State level.

Economic impact

A multisectoral steering group would provide a common platform for determining the types of natural disasters and the areas where a significant potential risk to human lives and health, the environment and economic activity can be expected. The use of an open method of coordination would provide member States with sufficient flexibility to schedule and budget the measures recommended in this framework according to their specific priorities and available resources. This will increase general acceptance of the potential economic costs involved.

Environmental impact

Through a more integrated approach to prevention, the negative impacts of disasters on the environment may be significantly reduced. Member States would be able to prevent future activities that affect the environment or adapt those activities to the risks.

Closer links among the Member States as well as within the Commission would not only ensure that risk-related measures do not affect the environment negatively, but also that measures taken have positive effects for the environment.

Social impact

A multisectoral steering group open to the various stakeholders from the Member States would increase knowledge and awareness, and therefore ensure ownership and social acceptance of the prevention measures proposed and agreed in this framework.

6.4. Improve the use of EU funds for preventing disasters

Specific options to improve the use of EU funds for preventing disasters include:

6.4.1. Specific funding

The creation of an additional instrument would on the one hand enable specific funding of prevention policies. On the other hand, as there is a wide variety of potential prevention activities ranging from exchanges of good practices to infrastructure projects, this option would require decisions on prioritising prevention of disasters over other objectives.

Existing situation

Today, no clear overview is available on what is being spent in the area of prevention, as delineation and interpretations of preventive action vary among EU funds and programmes. The impact of natural disasters on the Community budget was analysed in a European Parliament[41] study for the period 2003-2005, though studies are not available for the ongoing budgetary period.

Problems regarding the use of EU funds have been described in paragraph 3.3.3.

Existing EU funds are described in Annex 2.

Impact on the development of national prevention policies

The impact of such a fund could be to fill the gaps at Member State level, especially for countries that find it difficult to give priority to disaster prevention, in the light of the expected increase in the frequency and severity of disasters, particularly natural ones. Specific funding would thus enhance and accelerate the efforts of all Member States inducing European cohesion. To avoid overlaps, specific provisions coordinating the instrument with existing funding mechanisms would be needed.

Administrative costs at EU level

In order to develop more specific guidelines for EU funding in the area of prevention, sufficient technical resources will need to be set aside.

Administrative costs at national level

An increase in funding would have budgetary consequences for public authorities as they would have to set aside sufficient resources for administration and implementation, compared to what they have in place already. As a first step, providing better guidance on how to focus current Community funding on prevention would probably involve a smaller burden on Member States. However, in the medium to long run, the cost-benefit of increased focus on the area of prevention would pay off.

Economic impact

An increase in dedicated funding may raise the overall funding burden for Member States or may require rebalancing the funding priorities between sectors and activities.

---

[41] Impact of natural disasters on the Community budget, 2003-2005 study, European Parliament, Directorate General for internal policies, budgetary support unit, budgetary affairs.

Better guidance on funding of preventive action would provide a better common platform for prioritising the types of potential disasters that should be addressed and supported with EU funding, hence a more effective use of resources.

Environmental impact

Negative consequences of disasters on the environment would be reduced if more funding was provided. Member States could thus improve the way they prepare future activities that affect the environment or adapt those activities to the risks.

Social impact

Increasing the funding for prevention and better targeting of the funds towards prevention would also result in increased focus on the issue and more public awareness.

6.4.2. Guidance on use of funds

The production of such guidance would require human and financial resources at EU level and the participation of Member State and stakeholder experts. However this would represent limited costs. Depending on the interest of the Member States it might significantly improve the use of EU funds for disaster prevention. It would require better coordination among the various funds and programmes at both EU and Member State level, including a clarification of their respective scopes, in order to ensure better utilisation of budget resources and consistency with the priorities defined by the Member States and regions[42].

6.4.3. Enhancing prevention provisions in EU funding instruments

Enhancing prevention provisions in EU funding instruments would deliver improvement in the use of EU funds. However, given the current stage of programming for the use of the structural and other funds, the impact of this option is likely to be delayed to the next financing cycle. Its implementation may require additional work for Member States with regard to disaster prevention planning, and for the Commission in so far as the planning of additional measures is concerned.

6.5. Targeting specific risks and building on existing initiatives

6.5.1. Improving the targeting of disaster prevention in existing EU instruments

The potential for improving sectoral legislation should be addressed as part of its review cycle. For example, by strengthening the risk analysis and risk prevention elements in the Environmental Impact Assessment Directive (EIA Directive), it should be possible to focus more thoroughly on risk prevention.

Furthermore, the risk prevention approach would be streamlined into Member States' policies and plans, improving the quality and consistency of policies. This would cause only limited impacts in terms of administrative burden or disruption of existing national administrative structures.

---

[42] Summary of the Public Hearing "Natural disasters: how should Europe respond? 20 March 2006, IPOL/B/AGRI/NT/2006_02.

Moreover, the review of the SEVESO II Directive is ongoing. It focuses primarily on aligning the requirements of the directive to the new chemicals legislation (GHS) and on the administrative burden linked to the enforcement of the directive. Where appropriate, placing the amendment of the directive into a broader prevention process (including man-made and natural disaster causes) could be considered, in order to complement and give consistency to the prevention measures provided for under the directive. Impact assessment of possible changes would be part of a separate exercise.

6.5.2. Complementing existing sectoral initiatives with other specific initiatives, such as an EU initiative on forest fires

As various sectors possess particular experience, expertise and requirements, a sectoral approach seems to be needed in order to address specific disasters. On the other hand, these sector-based initiatives cover a limited number of the multiple hazards to which EU member States are exposed.

Existing situation

A number of EU legal instruments with elements of risk prevention already exist today, and new initiatives are expected. Any new sectoral initiative will have to take into consideration the approach followed under the EU Floods Directive[43] and the SEVESO Directive [44].

In particular, in so far as forest fires are concerned, measures and specific regulations to help Member States to prevent, combat and mitigate the effects of forest fires have been implemented at Community level, in line with Community competence in forestry (subsidiarity, shared responsibility).

The EU Forestry Strategy[45] (Council Resolution of 15 December 1998) and the EU Forest Action Plan[46] (adopted in June 2006) have outlined the current policy framework, including the further development of the European Forest Fire Information System EFFIS. The five-year Action plan consists of a number of key actions that the Commission proposes to implement jointly with Member States. In particular, the action plan indicates that

- with support from the EAFRD and Life + instrument, Member States may support forest fire prevention measures;

- with support from the EAFRD and the ERDF, Member States may enhance investments for natural hazard prevention and safety.

Impact on the development of national prevention policies

Specific initiatives on disasters are a solid basis for political prioritisation and decision, therefore accelerating efforts being made by the Member States.

---

43 Directive 2007/60/EC on the assessment and management of flood risks.

44 Council Directive 96/82/EC on the control of major-accident hazards involving dangerous substances.

45 OJ C56, 26.2.1999.

46 COM(2006)302 final

Assuming that the catalogue of prevention measures will include awareness-raising aimed at specific target groups[47], educational measures and the inclusion of private sector actors and civil society in prevention initiatives, the combined, active participation of several actors would contribute to speeding up resilience-building at national level.

Administrative costs at national level

The additional administrative burden linked to a dedicated initiative on forest fires (such as a directive) and placed upon member States would be low when compared to the potential benefits of preventing such fires.

Economic impact

A range of economic impacts is related to forest fires. These include the loss of human and animal lives, direct fire suppression costs, short and long term effects on health, production loss in the farming and forestry sector and related sectors, direct material losses. All these factors can slow down or discontinue economic activity in the affected areas. In the worst cases, they can totally disrupt economic and human activity in such areas. Increasing prevention efforts would obviously help reduce fire suppression costs[48].

By helping to conserve natural resources and economic activity, prevention efforts would also mitigate the impact of fires on local and national economies.

The forestry sector and related industries represent an important economic sector in countries such as Portugal where they are responsible for 3.4% of GDP (1993 figures[49]). Thus, loss of forest of the magnitude which Portugal experienced in 2003 and 2005 has an important bearing on the economy.

According to the Office National des Forêts (FR), the cost of burned forests is 9 000 € per hectare. Such a figure is based solely upon expenses arising from, extinction, cleaning and replanting. For 500 000 hectares (average year in the EU) this represents 4 500 million € of damage.

Preventive action reducing the number of hectares burnt by 10% would therefore represent a saving of 450 million €.

Environmental impact

The magnitude of forest areas burnt in the southern part of Europe between 2000 and 2007 caused loss of biodiversity in NATURA 2000 sites. More effective EU preventive action would have helped to minimise such loss. Since forest fires also contribute to CO2 emissions (e.g. in Portugal a yearly average of 1.6 million tonnes of carbon was emitted due to forest

---

47 A recent study on forest fires conducted for the European Parliament (forest fires: causes and contributing factors in Europe. Study conducted for the European Parliament, February 2008) states that an EU policy should be adopted to "encourage forest owners to share the responsibility through collective organisation with proper guidance, so that both small and large owners contribute to the reduction of fire risk".

48 WILDFIRE 2007 meeting in Sevilla confirmed the increasing fire suppression costs

49 Climate Change in Portugal — scenarios, impacts and adaptation measures (SIAM) 2001

fires between 2002 and 2006)[50], a decrease in their occurrence will positively contribute to reducing such emissions and will ensure the maintenance of the carbon retention capacity of forests.

Social impact

A FAO[51] study[52] states that *"The estimated social and economic damages caused by fires are enormous, although largely un-quantified"*.

Preventive measures that can reduce casualties and minimise harm and damage to individuals and communities can be expected to have a positive impact on society.

Ensuring the active participation of local communities, industry, businesses and NGOs in preventive action, in addition to the commitment of the public sector, for example, would boost the social impact of forest fire prevention. The case of Portugal has demonstrated that involving different sectors of society motivates citizens' groups and the private sector to show social responsibility in relation to forest fire prevention[53].

6.5.3. Framework legislation on prevention

Natural and manmade disasters do not always fall within one category which can be addressed through a single sector-specific approach. Futhermore, disasters may be caused by chain reactions, and different combined factors may affect their occurrence and severity.

Existing situation

Today, only a few Member States pursue an integrated approach to prevention (for instance United Kingdom, Netherlands, Denmark; France, Germany, and Sweden).

Impact on the development of national prevention policies

Such legislation would require setting up new systems in the Member States, or adjusting existing ones, to address the issues of disaster prevention, which may have significant impacts in terms of reorganising national administrations. On the other hand, it would have the potential for maximising the beneficial impacts of disaster prevention, improving in particular coordination and cooperation among Member States using the same set of approaches and risk assessments.

Administrative costs at national level

Since a framework legislation would encompass an integrated approach on risk mapping, the administrative costs impact assessment, in paragraph 6.2.1, is also of relevance.

The implementation of framework legislation would have budgetary consequences for public authorities as they would have to transpose the regulatory framework in the form of risk

---

50 Forest fires: causes and contributing factors in Europe. Study conducted for the European Parliament, February 2008

51 Food and Agriculture Organisation of the United Nations

52 Fire Management Working Paper FM18E, FAO 2006

53 Member States approaches towards Prevention Policy — a Critical Analysis. COWI, March 2008

assessments, risk maps and risk management plans into national legislation. It would have financial consequences on private stakeholders at implementation level, possibly involving investment shifts or increases. In general, the costs arising from such obligations would depend on the size and type of the area to be assessed. A transparent coordination mechanism at national level will also be needed. Such a mechanism may require additional resources, in particular staffing.

The costs of transposing and implementing the framework legislation at Member State level would depend on work already done and existing national legislation. Some Member States may already have similar procedures or elements of such a procedure in place, including some central coordinating body in charge of implementing a similar type of framework legislation.

The costs of producing national legislation would depend on the decisions made by the Member States on the scale, level of detail of legislation, and on the policy choices of Member States within the overall legislative framework, which is not detailed at this stage. In addition, some administrative costs would be required for monitoring and enforcement tasks.

Costs can be reduced if the framework legislation is flexible, leaving EU Member States with room to focus on risks which are particularly important and allowing each Member State to use existing data, methodologies and procedures for hazard analysis, hazard and risk mapping and risk management.

Economic impact

A framework legislation would provide a common platform for determining the types of natural disasters and the areas where a significant potential risk to human health and lives, the environment and economic activity can be expected.

Environmental impact

Through a more integrated approach to prevention, the negative impacts of disasters on the environment may be significantly reduced. Member States would be able to prevent future activities that affect the environment or adapt such activities to the risks.

Closer links with other EU legislation and overall prevention framework legislation would ensure not only that risk-related measures do not affect the environment negatively, but also that measures taken have positive effects for the environment.

Social impact

From a broader perspective, framework legislation setting out measures for prevention would contribute to reinforcing the level of protection of EU citizens.

Furthermore, it would reduce the health risks related to natural and man-made disasters, e.g. psychological distress, by decreasing their likelihood and impact.

Such legislation would also have a positive impact on the functioning of the labour market, as companies and industries would become less affected or disturbed by major disasters.

The public would become better informed about risks, and the outcome would be increased public awareness. This could result in monetary benefits as people aware of a potential risk

are inclined to be more receptive to risk warnings and protect themselves and their property accordingly, e.g. by simple risk reduction measures. In this way, the public may become actively involved in the development and implementation of disaster risk prevention measures.

7. COMPARING THE OPTIONS

7.1. Comparing the generic impacts of EU action and no EU action

At this stage of the policy cycle, policy-makers are confronted with the initial question of whether or not to develop specific EU initiatives to enhance disaster prevention in the EU. Table 7.1 in Annex 4 provides information on the generic impacts of developing or not developing such a policy.

The table demonstrates that the main impacts of the absence of EU action are potential divergences in the protection of citizens, the environment and property from disasters across the EU. EU action is expected to contribute to a better protection of such aspects. The financial and administrative burden at EU and national levels is expected to be relatively low compared to the benefits of EU action. The specifics and the magnitude of the impacts of EU action will depend on the area in which such action takes place, on the specific options selected and on the administrative implementation mode.

7.2. Build a consistent knowledge base on disasters

The table 7.2 in Annex 4 compares the impact of the options for building a consistent knowledge base on disasters.

The urgent need for action regarding the prevention of disasters and the importance of building a sound knowledge base require that action be taken swiftly and without delay. The creation of an inventory of information on disasters at EU level, building upon existing data collected by environmental data centres, is likely to deliver quicker, more comprehensive and more consistent results than the rather lengthy process of financing individual projects. Nevertheless, on specific areas, studies and cooperation projects involving Member States could be carried out under various EU instruments.

7.3. Link the various actors and sectoral policies

Table 7.3 in Annex 4 compares the impacts of options for linking the various actors and sectoral policies.

In the short term, a European network composed of representatives of the various national departments could provide a flexible option that could adjust to the different needs and resources of Member States whilst ensuring EU-wide coordination and consistency. It would have potential for delivering benefits at relatively low, though not negligible costs, would enhance understanding of disaster prevention issues at all levels, and would provide a basis for promoting this policy area further.

At the same time, the development of guidelines and lessons learnt on prevention aspects could have immediate benefits at a relatively limited cost at EU and national level.

7.4. Improve the use of EU funds for preventing disasters

Table 7.4 in Annex 4 compares the impacts of the options for improving the use of EU funds for preventing disasters.

Setting up a specific funding instrument for prevention could lead to overlaps with existing instruments if it is not well designed. Enhancing the profile of prevention in existing instruments appears to balance advantages and disadvantages in a more appropriate way. Given the urgency for action on disaster prevention, work should begin immediately via the development of guidelines encouraging Member States to make better use of Community funds for the prevention of disasters. This would also provide a basis for subsequently explore the need to develop provisions on disaster prevention in the context of the review cycles of the relevant funding instruments.

7.5. Target specific risks building on existing initiatives

Table 7.5 in Annex 4 compares the options for filling the gaps in existing initiatives.

The EU has adopted a specific directive for flooding, which is one of the major categories of disasters. Further specific initiatives (such as a forest fires directive) could be considered for other types of disasters. However, the scope for such initiatives appears to be limited to forest and other wild fires.

Integrating disaster prevention in the review process of relevant legislation is likely to bring benefits by logically complementing the prevention-preparedness-response-recovery cycle. Regarding industrial accidents, the ongoing review of the SEVESO Directive will assess the effectiveness of the Directive in relation to prevention. It will be important to assist Member States in the implementation of the existing directive.

In the long term, the development of an integrated legislation on the prevention of disasters may become workable. In the meantime, the integration of disaster prevention in the review process of relevant legislation is likely to reinforce the benefits expected from prevention action.

7.6. Conclusions on the comparison

7.6.1. Should the EU develop an EU strategy on disaster prevention?

This analysis suggests that such a strategy would be instrumental in reducing the impact of disasters within the EU, in terms of human losses, destroyed property and degraded environment, by reducing the disparities regarding the protection of people, the economy and the environment from the effects of disasters, by increasing the general level of awareness and protection among decision-makers and the public, and by promoting best practice. Moreover, existing experience suggests that investments in disaster prevention are cost effective since they appear to be significantly lower that the cost of recovery. An EU initiative regarding the prevention of disasters should include measures addressing four areas for action:

– building a consistent knowledge base on disasters;

– linking the various actors and policies;

– improving the use of EU funds for disaster prevention;

– Better targeting of specific risks, building on existing initiatives

At this early stage of policy-making, the Commission considers that adopting the baseline or "do-nothing" scenario would not sufficiently reduce the impact of disasters and ensure a fair level of protection for all EU citizens.

7.6.2. What are the available options for inclusion in the strategy?

A series of plausible options has been identified. They cover the following four areas for action and, depending on the level of ambition, they may be combined:

In a short to medium-term perspective:

– Accompanying measures such as the inclusion of the disaster prevention issue in the review cycle of relevant items of EU legislation, for example the Seveso Directive.

– Soft options covering the building of the knowledge base, the linking of policies and the improvement of the use of EU funds through the provision of guidance. This process could be guided by a European network composed of representatives of the various national departments concerned. It may require resources at EU and national levels.

In a medium to long-term perspective:

– The amendment of existing funding instruments may improve the consistency and effectiveness of EU funding for the prevention of disasters. The creation of a specific financial instrument for disaster prevention does not seem to be appropriate at this stage because of the significant efforts it would require at EU and national level.

– Specific measures such as integrated instruments addressing risk mapping and disaster prevention in general, or vertical instruments addressing specific disasters (e.g. forest fires). These might be more effective in reducing the negative impacts of disasters but would require significant effort at EU and national levels.

After the initial round of policy discussions, and before any combination of the abovementioned options can be inserted into the final strategy, thus becoming the subject of concrete proposals for action, a detailed impact assessment must be undertaken .

8. MONITORING AND EVALUATION

At this early stage of policy development, where no final decision will be taken regarding the selection of specific options, monitoring and evaluation arrangements do not need to be made. However, a number of the options considered in this impact assessment address the lack of a knowledge base, which would be necessary for any monitoring of disasters and their prevention.

Annex I: Available statistics and reference graphs on the number of disasters in EU-27 and their costs for the 2000-2008 period (EMDAT)[54]

Table 1: Number of natural, hydro meteorological and technical disasters in EU 27 2000-2008

	AT	BE	BG	CY	CZ	DK	EE	FI	FR	DE	EL	HU	IE	IT	LV	LT	LU	MT	NL	PL	PT	RO	SK	SI	ES	SE	UK	Total
Drought	0	0	1	1	0	0	0	0	0	0	0	1	0	1	0	1	0	0	0	0	1	1	0	0	0	0	0	7
Earthquake	0	0	1	0	0	0	0	0	0	1	4	0	0	4	0	0	0	0	0	0	0	0	0	1	0	0	0	11
Epidemic	0	0	0	0	0	0	0	0	1	2	0	0	2	2	1	0	0	0	0	0	0	1	0	0	2	2	2	15
Extreme Temperature	3	4	4	2	2	0	1	0	4	4	2	3	0	3	3	1	1	0	4	4	2	9	3	1	4	1	3	68
Flood	4	6	11	0	5	0	0	1	18	5	14	8	1	12	0	1	0	0	0	4	4	29	6	1	8	0	13	151
Industrial Accident	0	1	0	0	0	2	0	0	2	2	0	1	0	0	0	0	0	0	0	2	0	4	0	0	1	0	0	15
Misc Accident	1	0	0	0	0	0	1	0	7	2	0	0	0	1	0	1	0	0	3	1	1	1	1	0	4	0	1	25
Slides	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Transport Accident	1	1	0	1	1	0	0	1	6	5	12	3	0	14	0	0	1	6	0	2	3	3	1	0	15	0	3	79
Volcano	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Wild Fires	0	0	4	1	0	0	0	0	2	0	4	0	0	1	0	0	0	0	0	0	4	0	1	0	5	0	0	22
Wind Storm	5	3	2	2	5	3	1	0	13	14	4	3	4	2	2	1	0	0	4	7	1	6	1	2	4	2	7	98
Total	15	15	23	7	13	5	3	2	53	35	40	19	7	42	6	5	2	6	11	20	16	54	13	5	43	5	29	494

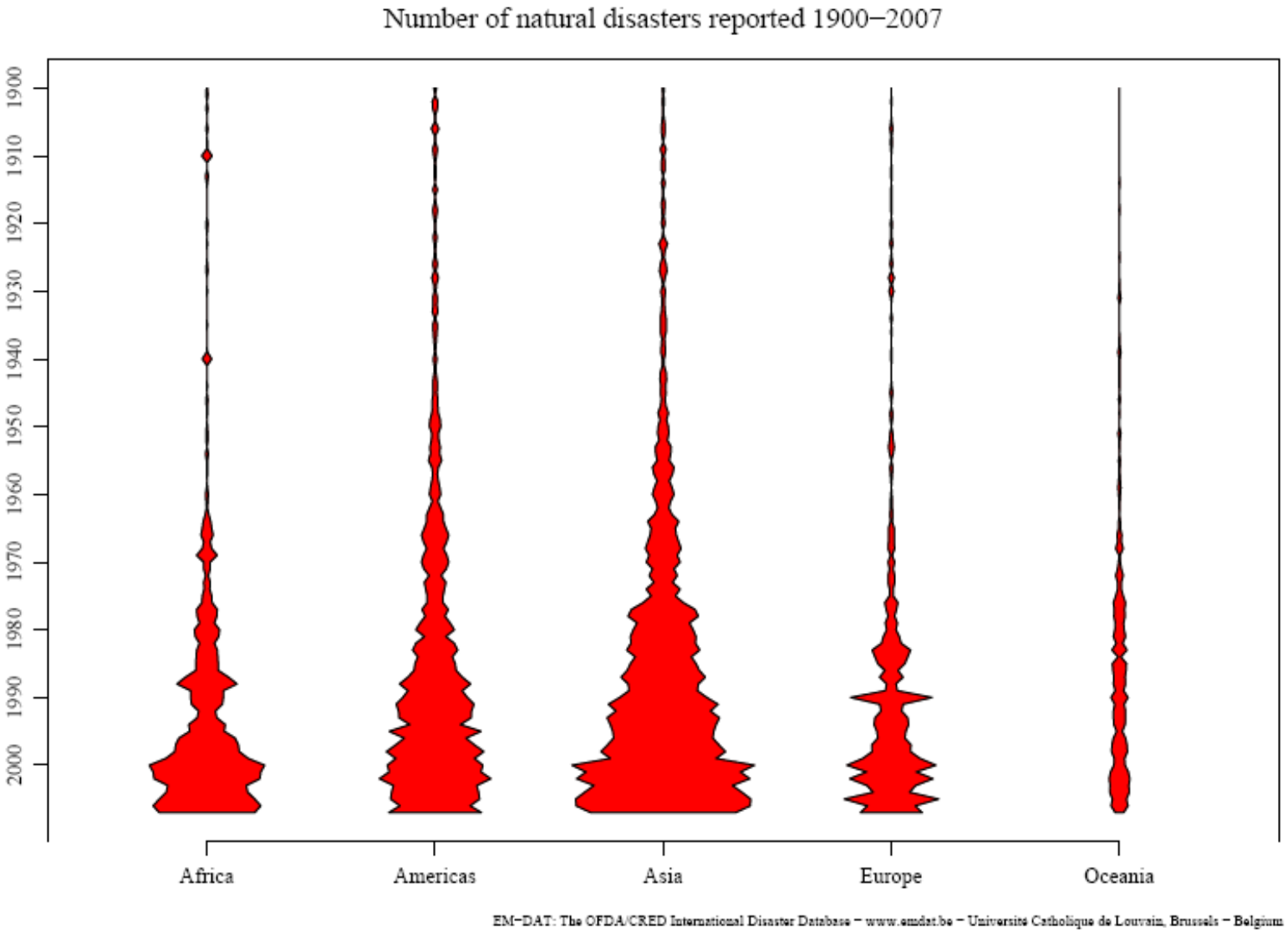
54 See footnote 7

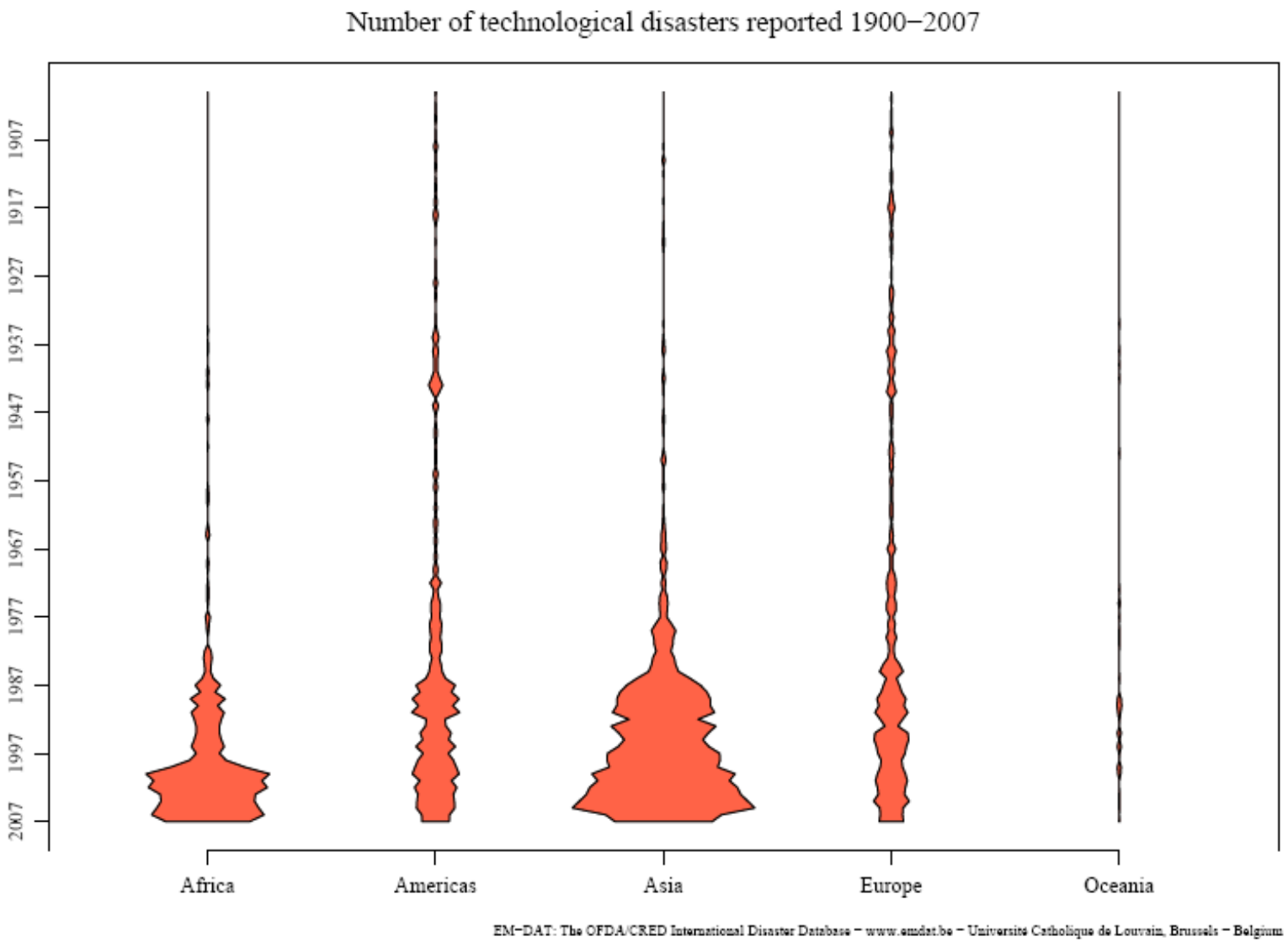
Table 02: Number of deaths caused by natural, hydro-meteorological, geological and technological disasters in EU 27, 2000-2008 (EM-DAT)

	AT	BE	BG	CY	CZ	DK	EE	FI	FR	DE	EL	HU	IE	IT	LV	LT	LU	MT	NL	PL	PT	RO	SK	SI	ES	SE	UK	Total
Drought	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Earthquake	0	0	0	0	0	0	0	0	0	0	0	0	0	30	0	0	0	0	0	0	0	0	0	1	0	0	0	31
Epidemic	0	0	0	0	0	0	0	0	1	0	0	0	2	3	0	0	0	0	0	0	0	0	0	0	2	0	11	19
Extreme Temperature	350	2117	27	9	433	0	3	0	20886	9368	43	581	0	20104	76	20	170	0	1965	728	2737	228	1	289	15146	0	302	75583
Flood	13	2	52	0	25	0	0	0	44	29	15	1	0	55	0	0	0	0	0	29	7	198	4	0	35	0	15	524
Industrial Accident	0	23	0	0	0	1	0	0	44	0	0	0	0	0	0	0	0	0	0	33	0	14	0	0	0	0	0	115
Misc Accident	12	0	0	0	0	0	22	0	93	26	0	0	0	19	0	25	0	0	45	65	70	10	11	0	18	0	14	430
Slides	13	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	17
Transport Accident	155	11	0	31	19	0	0	24	204	127	394	94	0	417	0	0	20	102	0	32	40	45	11	0	346	0	31	2103
Volcano	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wild Fires	0	0	10	0	0	0	0	0	7	0	79	0	0	11	0	0	0	0	0	0	31	0	6	0	23	0	0	167
Wind Storm	7	7	2	0	8	5	0	0	52	81	5	16	1	1	0	0	0	0	11	30	4	29	2	6	25	8	53	353
Total	550	2160	91	40	485	6	25	24	21331	9631	536	692	3	20644	76	45	190	102	2021	917	2889	524	35	296	15595	8	426	79342

Table 03: Total costs in thousands USD caused by natural, hydro-meteorological, geological and technological disasters in EU 27, 2000-2008 (EM_DAT)

	AT	BE	BG	CY	CZ	DK	EE	FI	FR	DE	EL	HU	IE	IT	LV	LT	LU	MT	NL	PL	PT	RO	SK	SI	ES	SE	UK	Total
Drought	0	0	0	0	0	0	0	0	0	0	0	100000	0	0	0	225573	0	0	0	0	1338136	500000	0	0	0	0	0	2163709
Earth-quake	0	0	0	0	0	0	0	0	0	12000	0	0	0	1857352	0	0	0	0	0	0	0	0	0	10000	0	0	0	1879352
Epidemic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Extreme Temperature	280000	0	50	0	0	0	0	0	4400000	1950000	3000	0	0	4400000	0	0	0	0	100000	0	0	0	150000	80000	880000	0	0	12243050
Flood	3100000	0	458000	0	2480000	0	0	0	2822350	11820000	605659	138000	0	9601000	0	0	0	0	0	700000	0	1548790	9000	5000	513285	0	14462150	48263234
Industrial Accident	0	100000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9960407	0	0	10060407
Misc Accident	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	256000	0	0	0	0	0	0	0	0	256000
Slides	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transport Accident	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Volcano	0	0	0	0	0	0	0	0	0	0	0	0	0	3100	0	0	0	0	0	0	0	0	0	0	0	0	0	3100
Wild Fires	0	0	20054	0	0	0	0	0	10000	0	1750000	0	0	0	0	0	0	0	0	0	3380000	0	0	0	2712000	0	0	7872054
Wind Storm	425000	455000	0	10000	170000	1400000	130000	0	251050	8560000	340000	10000	100000	175000	325000	30000	0	0	850000	100150	0	0	383300	392000	72000	2800000	3800050	20778550
Total	3805000	555000	478104	10000	2650000	1400000	130000	0	7483400	22342000	2698659	248000	100000	16036452	325000	255573	0	0	1206000	800150	4718136	2048790	542300	487000	14137692	2800000	18262200	103519456


Number of natural disasters reported 1900−2007
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
Africa
Americas
Asia
Europe
Oceania
EM−DAT: The OFDA/CRED International Disaster Database − www.emdat.be − Universite Catholique de Louvain, Brussels − Belgium


Number of technological disasters reported 1900−2007
1907
1917
1927
1937
1947
1957
1967
1977
1987
1997
2007
Africa
Americas
Asia
Europe
Oceania
EM−DAT: The OFDA/CRED International Disaster Database − www.emdat.be − Université Catholique de Louvain, Brussels − Belgium

Annex 2: Risk prevention funds

The European Regional Development Fund (ERDF)

Risk Prevention (natural and technological risks) is highlighted as one of the priorities of the ERDF for the 2007-2013 period. The Regulation on European Regional Development Fund[55] states that the prevention of risks is a priority, notably within the convergence (art 4.5), regional competitiveness and employment (art 5.2e) and European territorial cooperation objectives (art. 6.1b, 6.2b, and 6.3 a).

Between 2007 and 2013, around €5.8 billion will be available from Cohesion Policy programmes for management and prevention of risks in relation to various types of disasters, including forest fires.

An increase in funding for actions and initiatives related to prevention is already foreseen in a number of areas. For instance, the Community Strategic Guidelines for the Cohesion Policy 2007-2013 stress the need to take risk preventive measures through improved management of natural resources, targeted research and more innovative public management policies[56].

Some initial assessment has been made in a study on a Strategic Evaluation of the Structural and Cohesion Funds for 2007-2013, addressing natural risk hazards[57]. The study found that only 10 out of 15 countries had identified management of flood risks and 3 out of 15 countries had mentioned forest fires as main priorities for funding.

The European Agricultural Fund for Rural Development (EAFRD)

Besides other rural development measures that may indirectly contribute to the objective of disaster prevention, the rural development regulation provides support for natural disaster prevention, related to agricultural and forestry production potential. The EAFRD can support measures to restore agricultural production potential damaged by natural disasters and measures to introduce appropriate prevention schemes. For the programming period 2007-2013, € 732 million of the EAFRD budget (€ 1.48 billion for the total public expenditure) have been planned for this measure.

In addition, 1.55 € billion of the EAFRD budget (2.47 € billion for total public expenditure) have been earmarked for the measure “Restoring forestry potential and introducing prevention actions”. As the last rural development programmes have been approved in 2008, it is too early to assess the implementation of these measures.

In the context of the Health Check of the Common Agricultural Policy, the Commission has proposed to increase the amount of funding transferred from the first pillar (market and income policy) to the second pillar (rural development). The funding obtained this way could be used by Member States to reinforce rural development programmes, notably in the field of climate change. One of the operations that Member States could select to address as a climate change priority could be forest fire prevention. This would already contribute to the objective of enhancing the profile of prevention in the review of existing instruments.

The EU Solidarity Fund (EUSF)

---

55 EC Regulation N° 1080/2006 of the European Parliament

56 COM (2005) 0299, 5.7.2005

57 Strategic Evaluation on Environment and Risk Prevention under Structural and Cohesion Funds for the period of 2007-2013, No 2005.CE.16.0.AT.016. Synthesis Report, Directorate General Regional Policy, November 7, 2006

The EUSF provides financial support for emergency measures in the event of a major natural disaster. In principle, payments from the Fund are limited to financing emergency operations undertaken by the public authorities to alleviate non-insurable damage (such as rescue services, putting infrastructures back in operation, provisional accommodation, cleaning up, etc). Private damage and income losses, including agricultural damage, may not be compensated.

Member States must specify the prevention measures carried out in their implementation reports.

In April 2005, the Commission presented a proposal for a revised Solidarity Fund Regulation to the Parliament and to the Council. One of the key elements is an enlarged scope, enabling the Community to react to disasters other than those having natural origin. The proposal was very favourably received by the European Parliament but so far there has been no progress in the Council.

Examples of planned spending on risk prevention and management

The data is based on information published by the Directorate General for Regional Policy (source: Info-Regio) and gives examples of planned spending on risk prevention and management in the framework of the Operational Programmes on Environment and Sustainable Development under the Convergence objective, co-funded by ERDF and Cohesion Fund for the period 2007-2013:

- Greece has identified prevention and tackling of environmental risks as a priority. The objective is to support and improve the efficiency of public administration in dealing with environmental risks by setting up a civil protection network focusing on prevention, immediate reaction and prompt intervention. To meet this objective, anti-flood, anti-fire and anti-earthquake actions are defined. Special attention will be given to major technological accidents.

For the action “prevention and tackling of environmental risks (including waste)”, the budgets are estimated as follows:

EU contribution: €32 million

National Public contribution: €8 million

Total Public contribution: €40 million

- The **Czech Republic** focused on reducing industrial pollution, reducing emissions and the transfer of substances and reducing the level of environmental contamination by chemicals.

For the action “limitation of industrial pollution and environmental risks”, the budgets are estimated as follows:

EU contribution: €60 605 709

National Public contribution: €10 695 125

Total public contribution: €71 300 834

Annex 3

Table 6.1: Main direct benefits of preventing disasters

Disaster type	**Number of deaths and total costs in EU-27 in 2000-2007 (EM-DAT)**	**Potential benefits**
Major floods	524 deaths damage cost: 48 billion USD	Reduced number of deaths and injuries. Less impact on infrastructure (bridges, dams, transport infrastructure), and buildings. Floods are the risk type with the largest economic costs in EU-27.
Wind storms	353 deaths damage cost: 21 billion USD	Reduced number of deaths and injuries. Less impact on infrastructure and buildings and reduced costs of reconstruction of this disaster type with significant costs in EU-27. Reduced loss of habitats and biodiversity in forests.
Extreme temperature events (both extreme warm and cold periods)	75583 deaths damage cost: 12 billion USD	Significant reduction of number of deaths. Extreme temperature is the predominant risk factor causing deaths in EU-27.
Droughts	No deaths damage cost: 2 billion USD	Reduced impact on irrigated and rain-fed agricultural productivity and reduced water shortage. Less secondary economic effects due to reduced food production during drought.
Forest and wild fires	167 deaths damage cost: 8 billion USD	Reduced impact on forestry and agricultural sector productivity. Reduced number of deaths and injuries, less impact on infrastructure and buildings. Reduced loss of habitats and biodiversity.
Earthquake	31 deaths damage cost: 1.9 billion USD	Reduced number of deaths and injuries, less impact on infrastructure and buildings and reduced costs of reconstruction.
Tsunami	No disasters registered in EM-DAT	Although this is a rare event, tsunamis may cause a high number of deaths and major damage. Preventive actions may therefore have significant benefits in terms of reduced number of deaths and injuries, less impact on infrastructure and buildings.
Volcanic	0 deaths damage cost: 3 million USD	Reduced number of deaths and injuries, less impact on infrastructure and buildings.
Industrial accidents	115 deaths Damage cost: 10 billion USD	Reduced number of deaths and injuries to industrial workers and population in neighbourhoods of industrial installations and less impact on infrastructure and buildings close to industrial installations.

Annex 4: Comparison of the impact of the options

Table 7.1: Expected generic impacts of EU action and no-EU action

Impact category	**No EU action**	**EU action**
Direct impacts of disasters (see table 6.1)	Depends on national action — potential divergence	Decrease in the impact across the EU
Development of national disaster prevention policies	Unchanged trend — potential divergence Strengthening in some Member States particularly after having experienced major disasters	Strong encouragement to the Member States to address disaster prevention
Cost of disaster management	Depends on national action — potential divergence Where prevention is sub-optimal, management costs are expected to remain high	Decreased overall cost of disaster management and increased eco-efficiency
Protection of citizens and economic assets	Depends on national action — potential divergence	Improved protection of citizens and economic assets across the EU
Economic resilience	Depends on national action — potential divergence	Increase of economic resilience of sectors concerned
Nature and biodiversity	Depends on national action — potential divergence	Increased protection of nature and biodiversity
Administrative burden	No impact	Administrative burden at national and EU level
Effectiveness of use of EU funds	No impact Depends on national policy	Improved use of EU funds

Table 7.2: Comparison of options for building a consistent knowledge base on disasters

	Legislation on risk mapping	Disaster observatory	Financing projects
Direct impacts of disasters (see table 6.1)	++ Slow strong effects	+ Rapid moderate effects	+ Slow moderate effects
Awareness of citizens and other actors and emergence of a disaster prevention culture	++	+	+
Efficiency of the use of EU funds	++ Strong indirect impact	++ Strong indirect impact	+ Limited indirect impact
Administrative costs at national level	-- Most expensive option as it requires national legislation. It implies administrative burdens and compliance costs	- Costs would be limited to improving data collection, provision of data to the observatory. Administrative burden costs can be expected.	0 Any such costs would be compensated by EU funding
Administrative costs at EU level	- Proposing legislation and monitoring the implementation of adopted legislation costs	-- A disaster observatory would be created at EU level and would require more resources than monitoring the implementation of a directive	0 As projects would be included in existing instruments, no additional administrative costs are expected
Research on disaster prevention	+ Research will be needed to implement the option	++ The observatory would provide direct input to research priorities	+ Projects would contribute to improving research
Transboundary cooperation	0 The exercise would mainly be of a national character	+ The disaster observatory would foster exchange of information between the Member States	++ Projects would always involve a transboundary cooperation dimension

The sign (+) means a positive impact (e.g. reduced cost or increased efficiency), (-) means a negative impact (e.g. increased cost or reduced cooperation), (0) means no or negligible impact.

Table 7.3: Comparison of the options for linking the various actors and sectoral policies

	Multisectoral steering group	Best practices and guidelines
Direct impacts of disasters (see table 6.1)	+ High potential but relatively complex set-up could limit the impacts	+ High potential but the impact of guidance is by nature limited
Awareness of citizens and other actors and emergence of a disaster prevention culture	+ Limited direct impact on awareness	+ Limited direct impact on awareness
Efficiency of the use of EU funds	+	+
Administrative costs at national level	-	-
Administrative costs at EU level	-- moderate to high cost expected to ensure success	- Cost to set up the guidelines and for specific analysis of Member State programmes and reporting to Parliament and Council
Research on disaster prevention	+ Links made in group with research sector	++ Guidelines could cover all instruments including research programmes
Transboundary cooperation	+ The group in itself would create links between the Member State leading to opportunities for cooperation	+ Transboundary cooperation would be encouraged

The sign (+) means a positive impact (e.g. reduced cost or increased efficiency), (-) means a negative impact (e.g. increased cost or reduced cooperation), (0) means no or negligible impact

Table 7.4: Comparison of the options for improving the use of EU funds for preventing disasters

	Specific funding	Guidance on use of EU funds	Enhancing disaster prevention provisions in EU funding instruments
Direct impact of disasters (see table 6.1)	+ Limited to scope for significant resources under a specific instrument	+ High potential but the impact of guidance is by nature limited	++ Strong signals covering a range of significant financial instruments
Awareness of citizens and other actors and emergence of a disaster prevention culture	0	0	0
Efficiency of the use of EU funds	+	+	++
Administrative costs at national level	0 Costs compensated by EU financing	0 Costs compensated by EU financing	0 Costs compensated by EU financing
Administrative costs at EU level	-- The creation of a new instrument and monitoring its implementation represent the biggest additional costs	- Cost to set up the guidelines and for specific analysis of Member State programmes and reporting to Parliament and Council	- Initial costs to set up the requirements. In a second stage little or no additional costs given the full integration in the financial instruments
Research on disaster prevention	+ Research projects could be supported by a specific instrument	++ Guidelines could cover all instruments including research programmes	+ Research programmes would not be concerned by the option
Transboundary cooperation	+ Transboundary cooperation would be one criterion for projects financed	+ Transboundary cooperation would be encouraged	++ Transboundary cooperation would be one criterion for projects financed

The sign (+) means a positive impact (e.g. reduced cost or increased efficiency), (-) means a negative impact (e.g. increased cost or reduced cooperation), (0) means no or negligible impact

Table 7.5: Comparison of the options for filling the gaps in existing initiatives

	Specific sectoral initiative such as forest fires initiative	Complement legal framework	Review of Seveso directive	Framework legislation on disaster prevention
Direct impact of disasters (see table 5.1)	++ Ample evidence of scope and potential benefits of EU action	+ Limited to disasters addressed	+ Scope for improvement limited as the Directive already addresses prevention aspects	++
Awareness of citizens and other actors and emergence of a disaster prevention culture	++ Forest fires are a strong public concern given their frequency	+ Limited direct impact on awareness	+ Limited to public living close to installations covered by the directive and to the staff employed in those installations	+ Limited direct impact on awareness
Efficiency of the use of EU funds	++ Member States are expected to make more use of funding possibilities if a specific instrument exists	0	0 Limited impact if any as legal instrument already exists	+
Administrative costs at national level	-- A new directive would imply new efforts by the Member States, in particular in the vulnerable Member States. It will imply administrative burdens and compliance costs.	- (administrative burdens and compliance costs)	- Only incremental costs expected as implementation structures already exist in the Member States	-- (administrative burdens and compliance costs)
Administrative costs at EU level	-	-	-	-
Research on disaster prevention	+ New impetus would be given for the specific area of forest fire prevention	+ Limited to disasters addressed	0 Small impact if any	++ Legislation expected to give strong signals
Transboundary cooperation	+ Current levels of cooperation would be enhanced	0 This option would mainly trigger national action	0 Scope for improvement limited as the Directive already addresses prevention aspects	0 This option would mainly trigger national action

The sign (+) means a positive impact (e.g. reduced cost or increased efficiency), (-) means a negative impact (e.g. increased cost or reduced cooperation), (0) means no or negligible impact.