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**Research Programme Environment
(Including Climate Change)**

EUROPEAN RESEARCH ON NATURAL HAZARDS

CATALOGUE OF FP7 PROJECTS
(CALLS 2007 & 2008 & 2009 & 2010 & 2011)

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Sub-activity Natural Hazards

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VULNERABILITY

MOVE – Methods for the improvement of Vulnerability Assessment in Europe
211590
www.move-fp7.eu

Instrument: FP7 – Collaborative Project **Starting date:** 01/10/2008
EC contribution: 2,078,640.00 € **Duration:** 36 months
Organisation: Università degli Studi di Firenze
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PROJECT SUMMARY

MOVE will create knowledge, frameworks and methods for the assessment of vulnerability to natural hazards in Europe. It will use indices and indicators to help improve societal and environmental resilience. Emphasis will be placed on clear, capable measurement and accounting for uncertainties. MOVE will identify gaps in existing methodologies. It will produce a conceptual framework that is independent of scale and hazard type. It analyse physical (technical), environmental, economic, social, cultural and institutional vulnerability. These will be measured for specific hazards and at different geographical scales. Floods, temperature extremes, droughts, landslides, earthquakes, wildfires and storms will be studied. Methodologies will be tested in case study regions on vulnerable elements and appropriate hazard types. Case studies will enable the availability and quality of existing data at sub-national (NUTS 3-5) and local scales to be examined. MOVE will evaluate statistical data (for cities, from EUROSTAT, etc.) and remote sensing information. The case studies will integrate methods of estimating potential economic damage and social vulnerability. The generic framework, data analysis and applicability tests will result in a standard approach to vulnerability assessment in Europe. Stakeholders will be consulted systematically in order to understand their needs and to enable MOVE to draw attention to the practical value of its methodologies. There will be six work-packages. First, terms will be defined and gaps in existing methodologies identified. Next, a generic framework will be developed, with variants for particular scales, hazards and situations. Thirdly, the methods will be applied to case studies. The fourth and fifth packages will develop co-operation processes with stakeholders and ensure that the framework and the methods are disseminated for the benefit of European citizens.

The final milestone will encompass the development of a handbook for the practical assessment of vulnerability to natural hazards in Europe. This will provide an overview of the main research results and will include the procedures for the different assessment methods recommended in order to measure susceptibilities in different contexts of hazards and European environments. It will underline the competencies of European research in disaster risk management. It will outline the different methods and techniques as well as the indicators that are most appropriate to measure and assess vulnerability in Europe.

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ENSURE – Enhancing Resilience of Communities and Territories Facing Natural and Na-tech Hazards

212045

www.ensureproject.eu

Instrument:	FP7 – Research Project	Starting date: 01/06/2008
EC contribution:	1, 388,634.00 €	Duration: 32 months
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PROJECT SUMMARY

Since a long time vulnerability is a key concept in disaster literature. Nevertheless the majority of studies and grants have been allocated to hazards related research, neglecting the influence of vulnerability of exposed systems on the death toll and losses in case of natural or man made disasters. There is the need to better identify and measure also the ability of menaced and affected communities and territorial systems to respond. This is the starting point of the ENSURE project. The overall objective of ENSURE is to structure vulnerability assessment model(s) in a way that different aspects of physical, systemic, social and economic vulnerability will be integrated as much as possible in a coherent framework. The ENSURE approach starts from the recognition that for all considered hazards most of damages and most of vulnerabilities arise from the territory, including artefacts, infrastructures and facilities. They may well represent its material skeleton: physical vulnerability is therefore entirely “contained” at a territorial level. Other vulnerabilities, such as systemic, economic and social have interactions with the territory, but cannot be entirely determined at a territorial level. The project will start by assessing the state of the art in different fields related to various vulnerability aspects as they have been tackled until today in Europe and internationally. The core of the project consists in integrated models comprising already existing models to assess vulnerability and develop new ones for those aspects that have been neglected until now. The research objective is therefore to achieve progress with respect to each individual sector of vulnerability and to enhance the capability of assessing interconnections among them in a dynamic way, identifying driving forces of vulnerability, which make communities change for the good or for the worse as far as their ability to cope with extreme events is concerned.

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FLOODS

IMPRINTS – Improving Preparedness and Risk Management for Flash Floods and Debris Flow Events

FP7-ENV-2008-1-226555

<http://www.imprints-fp7.eu>

Instrument:	FP7 – Research Project	Starting date:	15/01/2009
EC contribution:	3,280,000.00 €	Duration:	36 months
Organisation:	Universitat Politècnica de Catalunya, Centre de Recerca Aplicada en Hidrometeorologia (CRAHI)		
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PROJECT SUMMARY

The aim of IMPRINTS is to contribute to reduce loss of life and economic damage through the improvement of the preparedness and the operational risk management for Flash Flood and Debris Flow [FF/DF] generating events, as well as to contribute to sustainable development through reducing damages to the environment. To achieve this ultimate objective, the project is oriented to produce methods and tools to be used by emergency agencies and utility companies responsible for the management of FF/DF risks and associated effects. Impacts of future changes, including climatic, land use and socioeconomic will be analysed in order to provide guidelines for mitigation and adaptation measures. Specifically, the project will develop an integrated probabilistic forecasting FF/DF system as well as a probabilistic early warning and a rule-based probabilistic forecasting system adapted to the operational use by practitioners. These systems will be tested on five selected flash flood prone areas, two located in mountainous catchments in the Alps, and three in Mediterranean catchments. The practitioner partners, risk management authorities and utility company managers in duty of emergency management in these areas, will supervise these tests. The development of such systems will be carried out using and capitalising the results of previous and ongoing research on FF/DF forecasting and warning systems in which several of the partners have played a prominent role. One major result of the project will be an operational prototype including the tools and methodologies developed under the project. This prototype will be designed under the premise of its ultimate commercialisation and use worldwide.

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CORFU - Collaborative research on flood resilience in urban areas

244047

<http://centres.exeter.ac.uk/cws>

Instrument: FP7 Collaborative project

Starting date: 01/04/2010

EC contribution: 3,490,000.00 €

Duration: 48 months

Organisation: University of Exeter

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Summarised goals and objectives:

Collaborative research on flood resilience in urban areas (CORFU) is an interdisciplinary international project that will look at advanced and novel strategies and provide adequate measures for improved flood management in cities. The differences in urban flooding problems in Asia and in Europe range from levels of economic development, infrastructure age, social systems and decision making processes, to prevailing drainage methods, seasonality of rainfall patterns and climate change trends. Our vision is that this project will use these differences to create synergies that will bring new quality to flood management strategies globally. Through a four-year collaborative research programme involving leading European and Asian institutions in this subject, the latest technological advances will be cross-fertilised with traditional and emerging approaches to living with floods.

The overall aim of CORFU is to enable European and Asian partners to learn from each other through joint investigation, development, implementation and dissemination of short to medium term strategies that will enable more scientifically sound management of the consequences of urban flooding in the future. Flood impacts in urban areas – potential deaths, damage to infrastructure and health problems in the first place and consequent effects on individuals and on communities – and possible responses will be assessed by envisaging different scenarios of relevant drivers: urban development, socio-economic trends and climate changes. The cost-effectiveness of resilience measures and integrative and adaptable flood management plans for these scenarios will be quantified.

More specifically, research and development activities will focus on:

- ***Synergies and governance*** to establish and maintain links with recently completed and ongoing major national, EU and other international research projects related to urban flooding;
- ***Studies of drivers*** that impact on urban flooding, in particular to determine the interactions between economic and urban growth, societal trends and the urban structure, which will serve as the basis for the development of a DPSIR (drivers-pressures-state-impact-response) logical framework. The analysis will be completed in conjunction with IPCC-based projections of climate change, economic, health and social development, aiming at identifying the future policy areas where the responses to the drivers and pressures can be most effective. This will be achieved through developing a fundamental understanding of how human capacity and action can shape the future dealing with urban flooding by identifying the future mechanisms through which feedback to drivers/pressures can be achieved and delivered to stakeholders.
- ***Flood hazard assessment based on urban flood modelling***. Missing elements in existing models for *system analysis* will be developed in order to identify consistent procedures for calibration of urban flood models at different scales, having in mind the envisaged technological advances – wider availability of weather radars and on-line rain gauges, increase in computer speed and possibilities for coupling of runoff-sewer-river hydrologic and hydraulic models. The ultimate objective is to develop generic tools for urban flood mitigation plans and test real time urban flood forecast systems, including real time data assimilation and including uncertainty estimates.
- ***Flood impact assessment***. The objective will be to develop a comprehensive and flexible framework that will amalgamate different methodologies for evaluation of *all* types of damage. Assessment of health problems will be taken to a higher level by a combination of hydraulic modelling of floods and quantitative microbial risk assessment. Interrelationships between risk perception, level of preparedness and actual responses will be studied, distinguishing between impacts on individual and on communities. The research will enable comprehensive and realistic assessment of vulnerability to urban flooding at different spatial and temporal scales, aiming at quantification of the efficiency of adaptive management strategies related to changes in drivers in alternative scenarios context and of the cost-effectiveness of resilient measures. Thus, the project will include a wide range of possible impacts and interactions of different drivers.
- ***Flood risk management strategies*** related to planning and prevention for the minimisation of flood risk, management during flood events including early warning systems, emergency protocols and crisis management and measures to be taken after a flood event, including evaluation of damages, recovery measures and the procedures that allow learning from experience. This approach guarantees comprehensive coverage of the whole flood management cycle. The project will develop new *strategic flood risk assessment strategies* by building on the outputs from the first parts of the project. A general strategic scheme for urban planning will be developed and tested, such that flood resilience is defined and implemented according to the situation of any

city. The ultimate objective will be to formulate good practices and good standards that can be implemented nationally in partner countries.

- *Disseminate new approaches* and support exploitation of opportunities at local, national and international levels. The aim will be to engender a 'flood resilience' culture through awareness rising of proposed strategies and comprehensive adoption of CORFU tools. This will be accomplished through engaging policy makers, especially in the CORFU study areas, to share best practice in flood resilient design and planning enabling policy decision making to be positively influenced by new urban flood risk management principles. Hence, CORFU will be a Collaborative Project for specific collaboration actions dedicated to international cooperation partner countries, targeted to Asia.

Key achievements and messages

Progress in science and identified barriers

Significant progress has been made in various elements of flood risk management (see e.g. FLOODsite). However, with the new tools emerging, new links and feedbacks between different approaches (including methods from different disciplines) are also becoming possible. Consequently, new and more demanding requirements are demanded of modern flood risk management strategies, some of which would have been unimaginable until recently due to technological limitations. CORFU will explore these new links by focusing on risk, prevention and management of urban floods. This will be done in two general ways, which describe the envisaged overall scientific progress of CORFU:

- Firstly, incremental advances will be made in various segments of modelling drivers and pressures, flood forecasting, flood risk analysis and mapping, flood impact assessment and flood risk management.
- Secondly, these segments will be coupled in a novel way – by envisaging different scenarios of relevant drivers such as urban development, socio-economic trends and climate change and quantifying the cost-effectiveness of resilience measures and integrative and adaptable flood management plans for these scenarios. The interdisciplinarity of the proposed programme will be essential for achieving this aim.

Key material/deliverables

The project will produce regular information bulletins and reports on the above research goals. Specific review reports will be made publicly available, describing study areas and research carried out on e.g. flood risk assessment strategies, development of consistent framework for analysis of urban flood risks, adapted flood damage assessment model prototype, flood damage model case study results, portfolio of climatic and socio-economic scenarios, new models (e.g. for flood impact to health analysis), recommendations for strategies and mechanisms, etc. Peer-reviewed and published papers are planned, with key texts addressed to stakeholders and policy makers, to include publication in 2011 for IPCC 5th AR and position paper at the end of the project

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STORMS

MICORE –
Morphological Impacts and COastal Risks induced by Extreme storm events
 CT – 202798
<http://www.micore.eu/>

Instrument: FP7 – CP **Starting date:** 01/06/2008
EC contribution: 3,499,954.00 € **Duration:** 36 months
Organisation: Università degli Studi di Ferrara
Co-ordinator: Prof. Paolo Ciavola (cvp@unife.it)
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PROJECT SUMMARY

The general aim of the project is to develop and demonstrate on-line tools for reliable predictions of the morphological impact of storm events in support of civil protection mitigation strategies. This is evidently in line with the scientific and environmental interests of TOPIC: ENV.2007.1.3.1.1. which aims to analyse and map storm related risks in sensitive European regions taking into account intensity, spatial extent, duration, hazard interaction effects. The project is specifically targeted to contribute to the development of a probabilistic mapping of the morphological impact of marine storms and to the production of early warning and information systems to support long-term disaster reduction.

A review of historical storms that had a significant morphological impact on a representative number of sensitive European sites will be undertaken (WP1). The nine sites are selected according to wave exposure, tidal regime and socio-economical pressures. They include outmost regions of the European Union at the border with surrounding states (e.g. the area of the Gibraltar Strait, the Baltic and Black Sea).

All data will be compiled into a homogeneous database of occurrence (WP2) to account for storm-related socio-economic damages, including information on the characteristics of the storms, their morphological impacts, the damages caused on society, the Civil Protection schemes implemented after the events.

Monitoring of selected sites will take place for a period of one year (WP3) to collect new data sets of bathymetry and topography using state-of-the-arts technology (Lidar, ARGUS, Radar, DGPS). The impact of the storms on living and non-living resources will be assessed using low-cost portable GIS methods.

Numerical models of storm-induced morphological changes will be tested and developed (WP4), using commercial packages and developing a new open-source morphological model. The models will be linked to wave and surge forecasting models to set-up a real-time warning system (WP5) and to implement its usage within Civil Protection agencies. The most important end product will be the production of risk indicators with defined threshold for the identification of major morphological changes and flooding associated vulnerability. Finally, the results of the project will be disseminated as risk maps through an effective Web GIS system (WP6).

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LANDSLIDES

SafeLand – Living with Landslide Risks in Europe

Project No. 226479

<http://www.safeland-fp7.eu>.

Instrument: FP7 – Collaborative Project
EC contribution: 6,610,000.00 €
Organisation: Norwegian Geotechnical Institute
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Starting date: 01/05/2009

Duration: 36 months

PROJECT SUMMARY

SafeLand will develop generic quantitative risk assessment and management tools and strategies for landslides at local, regional, European and societal scales and establish the baseline for the risk associated with landslides in Europe, to improve our ability to forecast landslide hazard and detect hazard and risk zones. The scientific work packages in SafeLand are organised in five Areas: Area 1 focuses on improving the knowledge on triggering mechanisms, processes and thresholds, including climate-related and anthropogenic triggers, and on run-out models in landslide hazard assessment; Area 2 does an harmonisation of quantitative risk assessment methodologies for different spatial scales, looking into uncertainties, vulnerability, landslide susceptibility, landslide frequency, and identifying hotspots in Europe with higher landslide hazard and risk; Area 3 focuses on future climate change scenarios and changes in demography and infrastructure, resulting in the evolution of hazard and risk in Europe at selected hotspots; Area 4 addresses the technical and practical issues related to monitoring and early warning for landslides, and identifies the best technologies available both in the context of hazard assessment and in the context of design of early warning systems; Area 5 provides a toolbox of risk mitigation strategies and guidelines for choosing the most appropriate risk management strategy. Maintaining the database of case studies, dissemination of the project results, and project management and coordination are defined in work packages 6, 7 and 8.

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DROUGHTS

Xerochore – An Exercise to Assess Research Needs and Policy Choices in Areas of Drought

211837

<http://www.feem-project.net/xerochore/>

Instrument: FP7 – Support Action **Starting date:** 01/05/2008
EC contribution: 1,500,889.00 € **Duration:** 18 months (extension 6 months expected)
Organisation: Fondazione Eni Enrico Mattei
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PROJECT SUMMARY

Prolonged dry and hot weather causing less than normal water availability has always been a challenging issue within parts of Europe. This will even be more so in the future with the predicted impacts of climate change suggesting a dryer and warmer Mediterranean region and a shift of climatic regimes in Europe northwards. As a result there will be a considerable enhancement of inter-annual variability in the summer climate, associated with higher risks of heat waves and droughts as experienced in recent years.

Droughts have a wide range of impacts. They affect the environment (e.g. water quality, aquatic ecosystems, wetlands, forest fires), the economy (e.g. rainfed and irrigated agriculture, forestry, energy sector (hydropower, cooling water), waterborne transport, water supply, tourism) and society more generally (e.g. health, poverty). Impacts will likely get worse with the predicted climate change and the increasing population and societies' rising water demands, a situation exacerbated by the need to maintain groundwater storage and river flows for ecological and human services.

Xerochore assists the development of a European Drought Policy. The project will lay down a roadmap that identifies the research gaps and steps to take in order to fill them. It focuses on three main themes: 1) natural and human-made causes of drought, 2) social-economic and environmental impacts; and 3) management and policy options, differentiated across sectors, to mitigate the negative impacts of droughts and increase community and ecosystem resilience.

The project also sets up a network of experts with various backgrounds (e.g. scientists, water resources engineers, stakeholders, planners, policy analysts, decision makers) and extends the European Drought Centre (EDC, <http://www.geo.uio.no/edc/>), established in 2004. Three major experts and stakeholders workshops will be held in Amsterdam (June 15-17, 2009), Venice (October 5-7, 2009) and Brussels (January 2010).

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DEWFORA
Improved Drought Early Warning and FORecasting to strengthen preparedness and adaptation to droughts in Africa

265454

Instrument: FP7 – CP-SICA **Starting date:** 01/01/2011
EC contribution: 3.490.000 € **Duration:** 36 months
Organisation: Deltares, Delft (NL)
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PROJECT SUMMARY

The principal aim of the DEWFORA proposal is to develop a framework for the provision of early warning and response to mitigate the impact of droughts in Africa. The proposal has been built to achieve three key targets:

1. Improved monitoring: by improving knowledge on drought forecasting, warning and mitigation, and advancing the understanding of climate related vulnerability to drought – both in the current and in the projected future climate.
2. Prototype operational forecasting: by bringing advances made in the project to the pre-operational stage through development of prototype systems and piloting methods in operational drought monitoring and forecasting agencies.
3. Knowledge dissemination: through a stakeholders platform that includes national and regional drought monitoring and forecasting agencies, as well as NGO's and IGO's, and through capacity building programmes to help embed the knowledge gained in the community of African practitioners and researchers.

To achieve these targets, the DEWFORA consortium brings together leading research institutes and universities; institutes that excel in application of state-of-the-art science in the operational domain; operational agencies responsible for meteorological forecasting, drought monitoring and famine warning; and established knowledge networks in Africa. The consortium provides an excellent regional balance, and the skilled coordinator and several partners have worked together in (European) research projects, implementation projects and capacity building programmes, thus building efficiently on previous and ongoing projects in Europe and Africa. The main impact of DEWFORA will be to increase the effectiveness of drought forecasting, warning and response. DEWFORA will provide guidance on how and where drought preparedness and adaptation should be targeted to contribute to increased resilience and improved effectiveness of drought mitigation measures.

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DROUGHT-R&SPI
Fostering European Drought Research and Science-Policy Interfacing
282769

Instrument: FP7 – Support Action **Starting date:** 01/10/2011
EC contribution: 3,439,950.00€ **Duration:** 36 months
Organisation: Wageningen Universiteit
Co-ordinator: Henry van Lanen (henny.vanlanen@wur.nl)
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PROJECT SUMMARY

The project will reduce future Europe's vulnerability and risk to drought by innovative in-depth studies that combine drought investigations in six case study areas in water-stressed regions (river basin and national scale) with drought analyses at the pan-European scale. Knowledge transfer across these scales is paramount because vulnerability is context-specific (e.g. physical, environmental, socio-economic, cultural, legal, institutional), which requires analyses on detailed scales, whereas international policies and drought-generating climate drivers and land surface processes are operating on large scales.

The project will adopt Science-Policy Interfacing at the various scales, by establishing Case Study Dialogue Fora and a pan-Europe Dialogue Forum, which will ensure that the research will be well integrated into the policy-making from the start of the project onwards. The study will foster a better understanding of past droughts (e.g. underlying processes, occurrences environmental and socio-economic impacts, past responses), which then will contribute to the assessment of drought hazards and potential vulnerabilities in the 21th C. An innovative methodology for early drought warning at the pan-European scale will be developed, which will improve on the forecasting and a suite of interlinked physical and impact indicators. This will help to increase drought preparedness, and to identify and implement appropriate Disaster Risk Reduction measures (along the lines of the UN/ISDR HFA). The project will lead through the combined drought studies at different scales to the identification of drought-sensitive regions and sectors across Europe and a more thorough implementation of the EU Water Framework Directive, particularly by further developing of methodologies for Drought Management Plans at different scales (incl. EU level). The work will be linked with the European Drought Centre ensuring that the outcome will be consolidated beyond the project' lifetime.

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SOCIAL SCIENCES

CapHaz-Net – Social Capacity Building for Natural Hazards: Toward More Resilient Societies

227073

<http://www.caphaz-net.org/>

Instrument: FP7 – Coordination Action **Starting date:** 01/06/2009
EC contribution: 910,000.00 **Duration:** 36 months
Organisation: Helmholtz-Zentrum für Umweltforschung – UFZ, Leipzig
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PROJECT SUMMARY

CapHaz-Net will contribute to the improvement of the social resilience of European societies to natural hazards by suggesting ways of how to do this. Improving the resilience is, above all, to be accomplished by strengthening social capacities. By social capacity we mean the societal assets, skills and resources necessary to anticipate, cope with and recover from stresses and disasters.

Based upon this, the overall objectives of **CapHaz-Net** are:

- To identify and assess existing practices and policies for social capacity building in the field of natural hazards at all societal levels across Europe for elaborating strategies and recommendations for activities to improve social capacity building in order to enhance the resilience of European societies and communities to the impacts of natural hazards.
- To identify further research needs in these fields.

The main research themes of **CapHaz-Net** are: risk perception, social vulnerability, risk communication, risk education, societal resilience, social capacity building and risk governance. **CapHaz-Net** wants to overcome the present fragmentation of these research approaches and related practices and to come to an integrative perspective. Therefore, the specific objectives are to:

- Develop a comprehensive and systematic overview of the current state-of-the-art of knowledge in the main fields of social-science research on natural hazards. **CapHaz-Net** will produce a structured know-how inventory for the topics outlined above by taking into account key studies, initiatives, best practices and legal tools;
- Identify current gaps in the knowledge base as well as issues requiring multi- and interdisciplinary research;
- Evaluate the contributions and relevancy of the above outlined themes for the creation of more resilient societies and communities by identifying and assessing existing practices and policies at different spatial scales across Europe;
- Develop and apply a conceptual frame for institutional learning and transfer of existing knowledge and best practice into action. Therefore stakeholders and policy-makers are included in the main activities of **CapHaz-Net** to enhance and foster communication between the scientific community, practitioners and policy-makers;
- Provide guidance and recommendations for further research and to improve future policy and practice in the field of natural hazards.

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ConHaz- Costs of Natural Hazards

CT- 244159

Instrument: FP7 – Collaborative Project

Starting date: 01/02/2010

EC Contribution: 899,487.00 €

Duration: 24 months

Organization: Helmholtz Centre for Environmental Research

Co-ordinator: Prof. Reimund Schwarze (reimund.schwarze@ufz.de)

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Project partners and Coordinator contact point/web link

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3	Société de Mathématique Appliquée aux Sciences Sociales	SMASH-CIRED	France
4	Middlesex University, Flood Hazard Research Centre	MU	UK
5	German Research Centre for Geosciences	GFZ	Germany
6	University of Ferrara	UniFe	Italy
7	Institute of Environmental Science and Technology, Universitat Autònoma de Barcelona	UAB	Spain
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Summarised goals and objectives

ConHaz will provide insight into cost assessment methods of natural hazards, which is needed for integrated planning, budgeting and policy action prioritisation for the various natural hazards. In order to comprehensively capture this variability in cost assessment methods, ConHaz will assess current knowledge, including use of terminology, on calculation methods for individual cost types (such as direct damages to housing and indirect losses in the macro-economy) and consider these methods as they are used in the context of specific climate and hydro-meteorology related hazards. The analysis will address theoretical issues, such as the principal assumptions that underlie economic valuation of damage types as well as practical issues, such as the qualifications needed for data collection and quality assurance. ConHaz will also look at the reliability of the end results by considering for instance the accuracy of cost predictions and best practice methods of validation. A central issue of the analysis will be to compare available methods with end-user needs and practices in developing mitigation and adaptation policies, so as to better identify best practice and knowledge gaps in relation to policy making, i.e. in relation to the development of emergency responses and policies for preparedness and risk prevention. In this sense, ConHaz aims strengthen the interaction between different knowledge communities including academics and practitioners, policy-makers and stakeholders.

Main topics of ConHaz are: Cost assessment methodologies (terminology, best practices), direct costs & production processes, indirect costs, intangible effects, costs and benefits of mitigation & adaptation to natural hazards (i.e., risk-prevention, preparedness and emergency response) to the extent that such cost calculations can actually be used in economic assessments of natural hazard policies.

ConHaz focuses on the following hazards: Droughts, floods, storms and induced coastal hazards, alpine hazards.

Major aims of ConHaz are to:

- to compile state-of-the-art methods for cost assessment as used in European case studies existing
- to analyse and assess these methods in order to identify best practice methods and identify theoretical and practical knowledge gaps
- to synthesise the resulting knowledge into recommendations for assessments of the costs of natural hazards and identify further research needs

Challenges:

The major challenge of ConHaz is to establish links between (i) different natural hazard communities' costing methods (ii) establish and strengthen the interaction between different knowledge communities including academics and practitioners, policy-makers and stakeholders. One of the central advances made by ConHaz is that it will systematically ensure the mutual engagement and the integration of perspectives both from different scientific communities as well as from scientists and practitioners. In this sense, ConHaz aims at overcoming the present fragmentation of these research approaches and related practices and to proceed towards an integrative perspective. There is a real need for a concerted examination of cost assessments of damages, prevention and response measures to natural hazards and disasters as they supply crucial information to decision support and policy development in the fields of natural hazard management.

emBRACE
Building Resilience Amongst Communities in Europe
283201

Instrument: FP7 – Coordination Action **Starting date:** 01/10/2011
EC contribution: 3,243,423.00 € **Duration:** 48 months
Organisation: UNIVERSITE CATHOLIQUE DE LOUVAIN
Co-ordinator: Debarati Guha (debby.sapir@uclouvain.be)
EC officer: Philippe Quevauviller (philippe.quevauviller@ec.europa.eu)

PROJECT SUMMARY

In an interdisciplinary, socially inclusive and collaborative context, emBRACE aims to improve the framing of resilience in the context of disasters in Europe. It will develop a conceptual and methodological approach to clarify how the resilience capacity of a society confronted with natural hazards and disasters can be characterized, defined and measured.

On the basis of a systematic evaluation of the widest literature base, the project will first elaborate an initial conceptual framework. Disaster footprints and a review of current data gaps and challenges for human impacts and development databases in providing resilience data on regional and national levels will help inform indicator development. These will then be tested and ground truthed by means of 6 well-chosen case studies across Europe exposed to different natural hazards, situated in different governance settings and socio-demographic-economic contexts.

Resilience will be contextualised through the application and evaluation of newly developed indicators and models, and will contribute to reformulation and adaption of the conceptual framework. emBRACE will considerably advance the methodologies for evaluating, modeling and assessing resilience of different actors. emBRACE will be methodologically rich, drawing on partner expertise across the research methods spectrum. It will apply these methods across scales from local to European. Stakeholders and experts will be incorporated into knowledge-sharing groups. There will be ongoing engagement with these stakeholders alongside programmed consultations during the development of the framework and model, case study work, and the reshaping of concepts, guidelines and database requirements for disasters and societal resilience. A key difference in emBRACE is the seeking out of people and groups not normally included in such fora; not as subjects of research but as partners in research and experts in their own right.

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EARTHQUAKES

SHARE – Seismic Hazard Assessment in Europe

CT – 226967

<http://www.share-eu.org>

Instrument:	FP7 – Collaborative Project	Starting date: 01/06/2009
EC contribution:	3,200,000.00	Duration: 36 months
Organisation:	Eidgenössische-Technische Hochschule Zürich (SED-ETHZ)	
Co-ordinator:	Prof. Domenico Giardini (d.giardini@sed.ethz.ch)	
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PROJECT SUMMARY

SHARE will deliver measurable progress in all steps leading to a harmonized assessment of seismic hazard - in the definition of engineering requirements, in the collection of input data, in procedures for hazard assessment, and in engineering applications. The SHARE-consortium will create a unified framework and computational infrastructure for seismic hazard assessment and produce an integrated European probabilistic seismic hazard assessment (PSHA) model including specific scenario based modeling tools. The results will deliver long-lasting structural impact in areas of societal and economic relevance, they will serve as reference for the Eurocode 8 (EC8) application, and will provide homogeneous input for the correct seismic safety assessment for critical industry, such as the energy infrastructures and the re-insurance sector. SHARE will cover the whole European territory, the Maghreb countries in the Southern Mediterranean and Turkey in the Eastern Mediterranean.

Taking into consideration the identified areas of socio-economic relevance, the existing challenges and present limitations of current approaches, SHARE will address the following specific objectives:

- We will build a framework for integration across disciplines, by involving participants, competences and experts spanning all fields from earthquake engineering to geology to engineering seismology, and for integration across national borders, to compile earthquake data and assess seismic hazard without the burden of political constraints and administrative boundaries. An authoritative community model will be assembled by seeking extensive expert elicitation and participation, and through community feedback.
- All partners will pursue best practices and high standards in all aspects of seismic hazard assessment, from data collection to the computational framework.
- SHARE will cover the whole Euro-Mediterranean area (for the Mediterranean we will include in this phase the Maghreb countries to the West and Turkey to the East, but not the Near East and Red Sea areas).
- Scientist and IT-specialists will develop the appropriate computational infrastructure as well as rigorous procedures to qualify and validate all components of the hazard, as a basis for longevity and continuous improvement of a dynamic model ready to incorporate the most recent developments from science and engineering.
- SHARE will maintain a direct connection to the Eurocode 8 applications and the definition of the Nationally Determined Parameters, through the participation of the CEN/TC250/SC8 committee in the definition of the output specification requirements and in the hazard validation.
- SHARE will produce direct outputs for risk assessment, enabling the European participation in the Global Earthquake Model (GEM) program (www.globalearthquakemodel.com) initiated by the OECD.
- The consortium will focus on the effective dissemination of hazard tools and results.

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SYNER-G Systemic Seismic Vulnerability and Risk Analysis for Buildings, Lifeline Networks and Infrastructures Safety Gain

CT- 244061

www.syner-g.eu

Instrument: FP7- Collaborative Project

Starting date: 01/11/2009

EC Contribution: 3, 500,000.00 €

Duration: 36 months

Organisation: Aristotle University of Thessaloniki (AUTH)

Co-ordinator: Prof. Kyriazsi Pitolakis (kpitolak@civil.auth.gr)

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Summarised goals and objectives

The goals of the SYNER-G research project are defined as following:

- To propose and further develop appropriate, in the European context, fragility relationships for the vulnerability analysis and loss estimation of all elements at risk, for buildings, building aggregates, utility networks (water, waste water, energy, gas), transportation systems (road, railways, harbors) as well as complex medical care facilities (hospitals) and fire-fighting systems.
- To develop social vulnerability relationships and other means of quantifying the impact of earthquakes on vulnerable communities.
- To develop the basis and principles of a unified methodology, as well as appropriate tools, for systemic vulnerability assessment accounting for all components (structural and non-structural) exposed to seismic hazard, considering interdependencies within a system unit and between systems belonging to a complex grid that comprises a functioning community (e.g. at city level where building aggregates and different lifeline networks are interacting among themselves and the final loss impact is increased, defined by the individual element losses as well as the losses due to the interaction). Socio-economic issues will be thoroughly considered in the SYNER-G methodology as an impact factor for the holistic evaluation of vulnerability and loss estimates.
- To test and validate the methodology and the particular fragility functions in adequately selected sites (city level) and systems.
- To implement the methodology in an appropriate open source and unrestricted access software tool, to prepare guidelines and to disseminate the results and the developed open-source software in national, European and worldwide level.
- To prepare guidelines and to disseminate the results and output with appropriate dissemination schemes.

Seven main objectives will be addressed and achieved by SYNER-G:

- The *first* scientific and technical objective of SYNER-G is to encompass all past and ongoing knowledge and know-how on this topic at a European and International level.
- The *second* objective is to select the most advanced fragility functions and methods to assess the physical and societal-economic vulnerability of assets (buildings, utility systems and transportation infrastructures, society, economy), improving and further developing new ones where necessary, considering European distinctive features.
- The *third* objective is to propose the most appropriate means of selecting seismic scenarios at system level.
- The *fourth* and quite innovative objective is to develop a unified methodology to assess vulnerability at a system level considering interdependencies between elements at risk (physical and non-physical), belonging to different systems and between different systems as a whole at city and regional scale.
- The *fifth* scientific and technical objective is to build an appropriate open-source software and tool to deal with systemic vulnerability in order to improve the seismic risk assessment and management.
- The *sixth* objective is to validate the effectiveness of the methodology and the tools to specific and well selected case studies at city and regional scale.
- The *seventh* and final objective is to propose adequate guidelines and to build appropriate dissemination schemes for all products of the project at European and International level.

SYNER-G is designed with 7 core themes:

- Development of a methodology to evaluate systemic vulnerability;
- Fragility functions of elements at risk;
- Socio-economic vulnerability and losses;
- Systemic vulnerability specification;
- Validation studies;
- Build prototype software;
- Guidelines, recommendations and dissemination.

The following test sites and systems are selected for application and to validate the efficiency of the methodology and tools:

Thessaloniki in Greece; Vienna in Austria; Messina in Italy (for calibration of census and remote sensing data); a motorway system in North-East Italy (regional scale); an electric power network of regional extension in Central Italy; a gas/oil pipeline; the harbor of Thessaloniki and a hospital facility in South Italy (Reggio di Calabria). Other validation site will be potentially introduced during the project (infrastructure networks in L'Aquila- Italy)

Key achievements and messages

Progress in science and identified barriers

Three main limitations of the existing know-how can be identified:

The first one is that, despite the large investment in several EU and national projects in EU Member States, and other countries (USA, Japan and elsewhere) in the vulnerability assessment of particular assets (residential and public buildings, lifeline systems and infrastructures like bridges), little work has been done to assess the *systemic vulnerability* of all these systems especially considering the interdependencies among elements at risk belonging to different systems and/or intra-dependencies within each system. The system's vulnerability is always higher than the sum of individual component's vulnerability.

The second is that the physical and *socio-economic vulnerability* of independent elements at risk is far from being studied in a homogenous and coherent way. Socio-economic impact is not currently systematically included in vulnerability and risk assessment studies. As a consequence the results from various studies cannot be easily integrated in a consistent large-scale loss assessment.

Finally, existing *fragility relationships and loss models* have been mostly derived outside Europe - with the exception for buildings and partially for bridges - and must be adapted to the *European context* and construction practice before use in a loss assessment study. There is an urgent need for identification and characterization of all the components/elements for all systems, in order to select and possibly to improve or even propose new adequate fragility relationships in the European context, reducing at the same time the uncertainties. Damage-Functionality relationships are also required in conjunction with the fragility relationships to assess the indirect losses associated to an earthquake event.

SYNER-G is proposing to tackle these needs in order to improve the European know-how and to propose a unified methodology for the vulnerability assessment and loss estimate at system level.

SYNER-G proposes to develop an integrated general methodology and a comprehensive simulation framework for the vulnerability assessment and the evaluation of the physical and socio-economic impact of an earthquake, allowing also for consideration of multiple interdependent systems within the infrastructure. The end result will be implemented into an open, modular and expandable software package for effective seismic risk management.

The main possible barriers are the potential lack of sufficient damage records and data from Europe. This may probably affect the experimental approaches. To overcome these barriers it is intended to use extensively numerical analysis and hybrid approaches

Results that can be used by policy makers

SYNER-G will contribute knowledge of direct relevance to many key activities required by the policy makers in seismic risk management issues, among others:

- methodology for the systemic vulnerability assessment of the main systems in a urban infrastructure
- fragility curves for all the elements at risk according to the European distinctive features and know-how
- results of validation studies and applications
- software tools
- guidelines and recommendations

Results of relevance for users, practitioners and managers

Same as above

Examples of results successfully used

N/A

Key material/deliverables

SYNER-G will produce more than 80 deliverables, including reports, software tools, dissemination material etc. There will be a short number of consolidated reports presenting the essential developments and results.

Besides classical reporting, other materials comprise:

- SYNER-G Web portal
- Prototype software tool for the systemic vulnerability assessment and loss estimation
- Applications and validation of the methodology and tools
- Project newsletter issues
- Dissemination material of all products and tools
- Guidelines and recommendations
- Reference reports and synthetic documents

No Report Title

- 1 Methodology for systemic seismic vulnerability assessment of buildings, infrastructures, networks and socio-economical impacts
- 2 Guidelines for typology definition of European physical assets for earthquake risk assessment
- 3 Remote sensing and integration of secondary data sources for earthquake loss estimation
- 4 Guidelines for deriving fragility functions of elements at risk: buildings, lifelines, transportation networks and critical facilities
- 5 Guidelines for the consideration of socio-economic impacts
- 6 Systemic seismic vulnerability and loss assessment: Validation studies
- 7 Systemic seismic vulnerability and loss assessment: Software Users Manual

- Journal and conference papers

- Technical workshops and final international workshop

Most of the dissemination material will be in electronic form

Future research questions identified

This issue will be addressed during and mainly at the end of the project

REAKT
Strategies and tools for Real Time Earthquake Risk Reduction
282862

Instrument: FP7-ENV-2011 **Starting date:** 01/09/2011
EC contribution: 6,972,190.00€ **Duration:** 36 months
Organisation: AMRA – Analisi e Monitoraggio del Rischio Ambientale Scarl
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PROJECT SUMMARY

Earthquakes are a serious threat for many European countries, particularly those around the Mediterranean Sea. In many cities exposed to high earthquake hazard, a substantial proportion of the population still lives in buildings that do not meet modern earthquake-resistant standards. Preventive actions, such as retrofitting of structures, are essential, but they are not sufficient and cannot be applied easily on a large scale. Real-time actions focussing on decreasing the physical vulnerability and exposure of populations are a viable way to reduce earthquake risk.

The primary objective of REAKT is to improve the efficiency of real-time earthquake risk mitigation methods and their capability of protecting structures, infrastructures and populations. REAKT aims to develop methodologies that will enhance the quality of information provided by earthquake forecasting, early warning and real-time vulnerability systems, as well as establishing best practices for how to use all of this information in a unified manner. In order to be used effectively, such information needs to be combined into a fully probabilistic framework, including realistic estimates of the uncertainties involved, that is suitable for decision making in real time.

The REAKT consortium draws together most of the main European institutes and research groups, in addition to major non-European institutes that are working on different aspects of earthquake early warning and probabilistic models of operational forecasting. The project is divided into 7 scientific work packages that constitute a logical sequence from, at one end, the processes involved in earthquake generation and the physics of short-term seismic changes, to the other, the threatened people through operational earthquake forecasting, early warning and rapid assessment of damage and vulnerability, decision making and capacity building, and the application of the developed methodologies to 12 strategic test cases.

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VOLCANOES

MIAVITA – Mitigate and Assess risk from Volcanic Impact on Terrain and human Activities

N° 211393

<http://miavita.brgm.fr/>

Instrument: FP7 – Research Project **Starting date:** 01/10/2008
EC contribution: 3,498,564.04 € **Duration:** 48 months
Organisation: Bureau de Recherches Géologiques et Minières - BRGM
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PROJECT SUMMARY

In EU countries, volcanic risks assessment and management are tackled through scientific knowledge and monitoring, although there is still a need for integration between all risk management components. For international cooperation partner countries (ICPCs), the risk management depends on local situations but is often less favourable. Therefore, following UN International Strategy for Disaster Reduction recommendations and starting from shared existing knowledge and practices, the MIA-VITA project aims at developing tools and integrated cost effective methodologies to mitigate risks from various hazards on active volcanoes (prevention, crisis management and recovering). Such methodology will be designed for ICPCs contexts but will be helpful for European stakeholders to improve their experience in volcanic risk management. The project multidisciplinary team gathers civil defence agencies, scientific teams (earth sciences, social sciences, building, soil, agriculture, Information Technologies and telecommunications) and an IT private company. The scientific work will focus on: 1) risk assessment methodology based on a multi-risk approach developed at Mt Cameroon by one of the partners in cooperation with Cameroonian institutions 2) cost efficient monitoring tools designed for poorly monitored volcanoes (satellite & gas analysis & volcano-seismology) 3) improvement in terms of vulnerability assessment (people, buildings and biosphere) 4) socio-economic surveys to enhance community resilience 5) Integrated information system (data organisation and transfers, communications) taking advantage of GEONETCast initiative Results will be achieved with help from local scientists and stakeholders in Africa (Cameroon, Cape Verde), in Asia (Indonesia, Philippines) and will be validated on a European volcano (Montserrat). The objectives will be reached through sharing/transfer of know-how, through scientific and technological developments, and through dissemination/training.

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VUELCO
Volcanic unrest in Europe and Latin America: Phenomenology, eruption precursors, hazard forecast, and risk mitigation
 N° 282769

Instrument: FP7-ENV-2011 **Starting date:** 01/10/2010
EC contribution: 3,499,993.01€ **Duration:** 48 months
Organisation: University of Bristol
Co-ordinator: Joachim Gottsmann (J.Gottsmann@bristol.ac.uk)
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PROJECT SUMMARY

Our knowledge of the causative links between subsurface processes, resulting unrest signals and imminent eruption is, today, wholly inadequate to deal effectively with crises of volcanic unrest. The VUELCO project consortium has come together for a multi-disciplinary attack on the origin, nature and significance of volcanic unrest from the scientific contributions generated by collaboration of ten partners in Europe and Latin America. Dissecting the science of monitoring data from unrest periods at six type volcanoes in Italy, Spain, the West Indies, Mexico and Ecuador the consortium will create global strategies for 1) enhanced monitoring capacity and value, 2) mechanistic data interpretation and 3) identification of reliable eruption precursors; all from the geophysical, geochemical and geodetic fingerprints of unrest episodes. Experiments will establish a mechanistic understanding of subsurface processes capable of inducing unrest and aid in identifying key volcano monitoring parameters indicative of the nature of unrest processes. Numerical models will help establish a link between the processes and volcano monitoring data to inform on the causes of unrest and its short-term evolution. Using uncertainty assessment and new short-term probabilistic hazard forecasting tools the scientific knowledge base will provide the crucial parameters for a comprehensive and best-practice approach to 1) risk mitigation, 2) communication, 3) decision-making and 4) crisis management during unrest periods. The VUELCO project consortium efforts will generate guidance in the definition and implementation of strategic options for effective risk mitigation, management and governance during unrest episodes. Such a mechanistic platform of understanding, impacting on the synergy of scientists, policy-makers, civil protection authorities, decision-makers, and the public, will place volcanic unrest management on a wholly new basis, with European expertise at its peak.

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FOREST FIRES

Assessing our capacity to adapt to future changes and evaluate future vulnerabilities

Current fire prevention, fire fighting and management of fire-prone areas are based on past conditions. Quite commonly, planning involved the evaluation through models of fire characteristics to infer fire breaks, location of points for provisioning water, etc. Restoration is done based on the suitability of areas for certain species based on past climate. Until now, fire prevention, fire fighting, land management and restoration policies were not confronted with the new paradigm of non-stationarity.

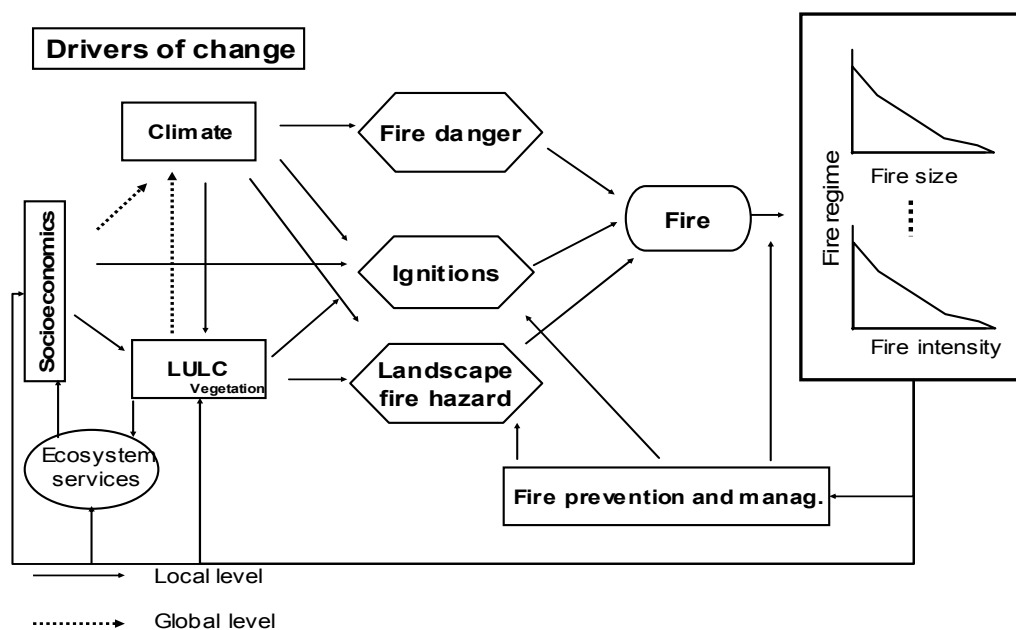


Fig. 1. Diagram showing the complex interactions that govern fire. Socioeconomic drivers affect the global economy and, through it, the global and local climate and land use/land cover (LULC). These determine fire danger, ignition sources and fire hazard. Fire spread will depend on fire fighting and other management measures. Fire regime is the result of these interacting factors. Fires can modify the landscape and affect future fires as well as ecosystem services. Changes in drivers will affect fire regime.

The objectives of FUME (Module 3) are to appraise and develop protocols and approaches for fire prevention and fire planning capable of dealing with longer and more severe fire seasons and with new areas exposed to fire risk. In particular, the management of fires under most extreme conditions and under the pressure of other significant threats to humans, such as during heat waves and droughts and at the rural-urban interface will be considered. Managing and restoring fire-prone landscapes, including new fire areas under the new changing conditions will be investigated. Finally, the costs associated to the expected changes to cope with fire, the damages in some ecosystem services as a result of the new fire regime, and the revision of policies at European level in the light of future risks will also be researched.

To achieve these results, the availability and easy access of data by those involved is a crucial element. Furthermore, models need to be validated at sites where information from all sources is available. Module 4 will take care of these needs by having specific WPs. Additionally, training, knowledge transfer and outreach and dissemination are additional elements needed to be in place right from the beginning. Conditions are already changing, and policy makers and managers need to be informed from this initiative as early as possible. Again, Module 4 will address these issues. Finally, a complex project needs a proper management structure. Particular effort has been done in FUME to have this in place by designing a complete scheme of relationships among all participating.

Key achievements and messages

Future forest fires assessment will be produced from the retrospective analysis of climate, land use change and fire regime, and from the modelling and mapping of new fire regime as affected by climate, socio-economic and land use change projections. This understanding of future fire risk will be completed with the analysis of its consequences on the environment and on society. On this basis, strategies to improve society preparedness to face new, worse fire threats are going to be developed. Particular attention will be paid to extreme climate events, hot spots for fire occurrence and/or severity, newly affected areas (identify areas that will experience a substantially enhanced risk of fire as a consequence of climate change projections), and the rural-urban interface (RUI).

Message: Forest fires are likely to be more severe in the near future and society should be prepared and get adapted to them. FUME aims at providing the scientific basis for preparedness and adaptation at different scales and for the various stakeholders.

FUME will promote sustainable management of the natural and human environment by increasing our knowledge about the dependencies between land use practices, socio-economic development, climate change and wildfires, in order to improve Europe capabilities to cope with increasing threats of wildfires under changing climate. We expect significantly improving our understanding on the interactions between human activities, fires, and climate in Europe at different scales (from sites to regions). This knowledge will result in improving and developing new operational protocols and civil

protection strategies to prevent and combat more severe forest fires, and helping decision makers in implementing them through the use of spatially-explicit fire simulators in the FUME network of sites. Vulnerable areas will be identified for fire-prone landscapes, and prevention and post-fire restoration strategies and protocols will be developed. Forest management planning and urban developments should take into account future fire risk in order to avoid catastrophic events. Costs associated to the expected changes in fire regime will be estimated to provide baseline information for the revision of European policies to cope with future fire risk. The appropriateness of current EU policies in the context of changing fire regime will be revised, thus enabling anticipatory modifications of such policies.

FUME will contribute to the implementation of the EU international commitments:

- UNFCCC and IPCC: assessing the potential implications of forest fire events on the European climate change mitigation strategies (Kyoto and post-Kyoto) through their effects on forest carbon sink. Linking scenario development to impacts and vulnerabilities in the framework of IPCC 5AR.
- UNCBD: impacts on new forest fire regimes on ecosystems. Management and restoration schemes for fire-prone regions.
- UNCCD: identifying vulnerable ecosystems to new forest fire regime and developing mitigation and restoration strategies and techniques to minimize land degradation and desertification.
- International Strategy for Natural Disaster Reduction: risk prevention and mitigation plans will be elaborated for scenarios never seen before, thus providing elements for better preparedness.
- EU Water Framework Directive: evaluation of new fire risks on watershed heads in newly affected areas that may be relevant on water resources.

Key material/deliverables

- Map of large fire events at Euro-Mediterranean scale in the last 20 years using low resolution satellite data.
- Maps of future fire danger in Europe, on the basis of regional climate change projections.
- Future extreme weather/climate conditions analysis
- Review of existing protocols of fire prevention and fire fighting
- Development of tools for mapping rural-urban interface (RUI) and landscape-level fire risk analysis
- Fire regime and socio-economic change analysis
- Maps of future fire regime in Europe.
- Assessment of human impacts on fires
- Land use and RUI change scenarios development
- Methods of assessment of fire risk at the RUI
- New fire areas: identification, analysis of vulnerabilities, development of prevention and restoration strategies
- Fire under extremes
- Adaptive measures in fire prevention planning
- Fire probability maps
- Restoring burned ecosystems under climate and land use change
- Adaptive measures in fire management
- Implications of projected new fire regime for EU Policies
- Two training courses on climate change and fires.

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MULTI-RISK / RISK PREVENTION

Kulturisk
Knowledge-based approach to develop a cULTure of Risk prevention
No. 265280
www.kulturisk.eu

Instrument: FP7 –Collaborative Project **Starting date:** 01/01/2011
EC contribution: 3.225.616€ **Duration:** 36 months
Organisation: Unesco-IHE Institute for Water Education
Co-ordinator: G. Di Baldassarre (G.DiBaldassarre@unesco-ihe.org)
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Summarised goals and objectives

The extreme consequences of recent catastrophic events have highlighted that risk prevention still needs to be improved to reduce human losses and economic damages. The KULTURisk project aims at developing a culture of risk prevention by means of a comprehensive demonstration of the benefits of prevention measures. The development of a culture of risk prevention requires the improvement of our: a) memory and knowledge of past disasters; b) communication and understanding capacity of current and future hazards; c) awareness of risk and d) preparedness for future events.

KULTURisk aims to:

1. Review static and dynamic measures to prevent water-related hazards with focus on risk communication techniques.
2. Develop a risk-based methodology for evaluating diverse risk prevention measures in different case studies.
3. Demonstrate that prevention measures are more effective from a social and economic point of view than post-disaster recovery for different types of water-related risks (e.g. floods, landslides).
4. Promote a culture of risk prevention by using the KULTURisk outcomes as examples to: a) increase the risk awareness of the public via improved communication; b) shape risk perception of inhabitants in an appropriate and responsible way; and c) train professionals to better evaluate the socio-economic benefit of risk prevention techniques for water-related risks.

KULTURisk will develop a methodology to demonstrate the benefits of risk prevention techniques, which will be applied to a variety of case studies characterised by different socio-economic contexts and types of water-related hazards. The method will be able to evaluate to which extent prevention actions are more efficient than post-event recovery and help stakeholders to better consider the benefits of risk prevention. Two transboundary catchments (the Soca-Isonzo and the Danube) will enable the investigation of cross border aspects. The case studies (6 in total), will be used to demonstrate not only the benefits of risk prevention, but also the need for a European approach to prevent natural disasters. The KULTURisk research will be based on up-to-date techniques and the methodology will be able to include driving factors such as land-use changes, spatial planning and climate change impacts. Education material will be made available on website to raise stakeholders' awareness.

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made. This will contribute not only to the improvement of risk assessment processes, but also to the development of more cost-effective risk reduction measures, with real benefits for European communities.

There is extensive work that has already been carried out – though mainly for single hazard/risk

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**CATALYST-
Capacity Development for Hazard Risk Reduction and Adaptation
No. 283177**

Instrument: FP7-ENV-2011 **Starting date:** 01/10/2011
EC contribution: 843,931.57 € **Duration:** 24 months
Organisation: SEECONSULT GMBH
Co-ordinator: Caroline Van Bers (cvanbers@seeconsult.org)
EC officer: Paola Agostini (paola.agostini@ec.europa.eu)

Summarised goals and objectives

The coordinating action, Capacity Development for Hazard Risk reduction and Adaptation, or CATALYST, brings together scientists, stakeholders and networks to identify and share the best of knowledge, know-how and practices related to natural hazard and disaster risk reduction (NH/DRR), including adaptation. Its ultimate objective will be the strengthening of capacity development in this area. Strengthening of capacity development will be achieved by facilitating knowledge exchange and improving the science-application interface; deepening and adding value to the body of integrated knowledge on NH/DRR; identifying key gaps in current NH/DRR knowledge and research; reinforcement of existing European and International network capacity; increasing the capacity of NGOs and SMEs to mainstream NH/DRR in their activities; the effective dissemination of the findings of the coordinating action; and the development of an enduring NH/DRR reference website and online discussion forum.

A core activity of CATaLyST is the convening of stakeholders including researchers and practitioners in a think tank allowing virtual and face-to-face exchange on areas of concern such as methodological limitations and data gaps, as well as best practices. This coordinating action will also establish and maintain during the project's duration, an information archive (as part of the project website) that is easily accessible to the research community for finding out more about existing NH/DRR resources and research work. The archive will be transferred together with the website to an existing organisation or SME concerned with NH/DRR to ensure that it is maintained and enhanced.

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ADDITIONAL INFORMATION ON RELEVANT PROJECTS IN OTHER SUB-ACTIVITIES OF THE ENVIRONMENT PROGRAMME:

Sub-activity Environmental Technologies /Cultural Heritage :

Title: Technologies for the cost-effective Flood Protection of the Built Environment (FLOODPROBE)

EC Contribution: 3 498 717,15 €

Duration: 48 months

Start Date: 1/11/2009

Consortium: 14 partners from 7 countries

Project Coordinator: Deltares (The Netherlands)

Project Web Site: www.FloodProbe.eu

Title: Smart resilience technology, systems and tools (SMARTEST)

EC Contribution: 3.49 Mio €

Duration: 36 months

Start Date: 1/10/2010

Consortium: 10 partners from 7 countries

Project Coordinator: Building Research Establishment Ltd (UK)

Project Web Site: www.floodresilience.eu

Title: Fire Detection and Management through a Multi-Sensor Network for the Protection of Cultural Heritage Areas from the Risk of Fire and Extreme Weather Conditions (FIRESENSE)

EC Contribution: 2 697 092 €

Duration: 36 months

Start Date: 1-12-2009

Consortium: 10 partners from 6 countries

Project Coordinator: Nikos Grammalidis, Centre for Research and Technology Hellas - Informatics and Telematics Institute, Thessaloniki (Greece)

Project Web Site: www.firesense.eu

Title: New Integrated Knowledge Based Approaches to the Protection of Cultural Heritage from Earthquake-Induced Risk (NIKER)

EC Contribution: 2 736 114 €

Duration: 36 months

Start Date: 1-01-2010

Consortium: 18 partners from 12 countries

Project Coordinator: Claudio Modena, University of Padova (Italy)

Project Web Site: www.niker.eu

Title: Performance-based approach to earthquake protection of cultural heritage in European and Mediterranean countries (PERPETUATE)

EC Contribution: 2 237 475 €

Duration: 36 months

Start Date: 1-01-2010

Consortium: 11 partners from 7 countries

Project Coordinator: Sergio Lagomarsino – University of Genoa (Italy)

Project Web Site: www.perpetuate.eu

Sub-Activity Natural Resources:

Title: Forest and Land Management Options to Prevent Unwanted Forest Fires (FIRESMART)

EC Contribution: EUR 920 000

Duration: 24 months

Start Date: 01/02/2010

Consortium: 8 partners, 6 from four different European countries, plus two international organisations.

Project Coordinator: GMV, Spain

Project Web Site: www.eufiresmart.net

Title: Climate change and urban vulnerability in Africa (CLUVA)

EC Contribution: 3.49 Mio €

Duration: 36 months

Start date: 01.12.2010

Consortium: 7 EU partners and 6 African partners

Project Coordinator: AMRA Italy

Project web site: www.cluva.eu

CLIMATE CHANGE AND NATURAL HAZARDS SERIES

N°	Title	EUR
1	EUROPEAN RESEARCH ON CLIMATE CHANGE Catalogue of 6 th Framework Programme Projects - Volume 1	21935
2	EUROPEAN RESEARCH ON NATURAL HAZARDS Catalogue of selected 5 th Framework Programme and 6 th Framework Programme Projects - Volume 1	21936
3	EUROPEAN RESEARCH ON FLOOD RISK MANAGEMENT A contribution to the concerns generated by the summer 2005 floods in Europe - Proceedings of a Workshop on 10 October 2005 in Brussels	22024
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8	EUROPEAN RESEARCH ON CLIMATE CHANGE Catalogue of 6 th Framework Programme Projects – Volume 2	22421
9	INTERNATIONAL WORKSHOP ON CLIMATE CHANGE IMPACTS ON THE WATER CYCLE, RESOURCES AND QUALITY, Brussels, 25-26 September 2006 - Scientific report	22422
10	INTERNATIONAL CONFERENCE ON TRANSPORT, ATMOSPHERE AND CLIMATE (TAC), Oxford, UK, 26-29 June 2006 - Proceedings	22428
11	INTERNATIONAL SYMPOSIUM ON POLAR ENVIRONMENT AND CLIMATE CHALLENGES, Brussels, 5-6 March 2007 – Conference Proceedings	22965
12	EUROPEAN RESEARCH ON NATURAL HAZARDS Catalogue of selected 5 th Framework Programme and 6 th Framework Programme Projects – Revised Volume 1	21936
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14	PRINCIPLES OF MULTI-RISK ASSESSMENT Interaction amongst natural and man-induced risks	23615
15	EUROPEAN RESEARCH ON NATURAL HAZARDS Catalogue of 7 th Framework Programme Projects	See next web page*

Framework Programme 7 information (Cordis)

http://cordis.europa.eu/fp7/home_en.html

http://cordis.europa.eu/fp7/environment/home_en.html

Research on the Environment Portal

On http://ec.europa.eu/research/environment/index_en.cfm?pg=hazards*

European Commission policies

http://ec.europa.eu/policies/index_en.htm

Monthly magazine on European Research (available in EN, FR, DE, ES)

Research*eu

http://ec.europa.eu/research/research-eu/index_en.html