PROVISIONAL WORK PROGRAMME 2007[1]

COOPERATION

THEME 6

ENVIRONMENT (INCLUDING CLIMATE CHANGE)

(European Commission C(2006) 6839)

[1] This provisional work programme is subject to formal confirmation following the entry into force of the 7th EC Framework Programme and the Specific Programme Cooperation.

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THEME 6: ENVIRONMENT (INCLUDING CLIMATE CHANGE)

Objective:

To promote sustainable management of the environment and its resources through advancing our knowledge on the interactions between the climate, biosphere, ecosystems and human activities, and developing new technologies, tools and services, in order to address in an integrated way global environmental issues. Emphasis will be put on prediction of climate, ecological, earth and ocean systems changes, on tools and on technologies for monitoring, prevention, mitigation of and adaptation to environmental pressures and risks including on health, as well as for the sustainability of the natural and man-made environment.

I CONTEXT

Policy context

Research under this Theme contributes to the implementation of relevant international commitments[2], protocols[3] and initiatives[4] concluded by the European Union and Member States. In addition, it will support the research needs arising from existing and emerging EU environmental legislation and policies[5], and the implementation of the 6th Environmental Action Programme, associated thematic strategies[6] and the action plans[7]. The renewed Sustainable Development Strategy, approved in June 2006, reaffirms the strong political willingness from the European Union to move into the sustainable path, where environmental protection goes hand in hand with economic prosperity and social cohesion. EU-wide cooperation is necessary because sustainable development is a common objective for countries, regions and cities and that critical mass and excellence are needed given the scale, scope and high level of complexity of environmental research and its connections to economy and society. Furthermore, wider international cooperation is necessary for the completion of knowledge and the promotion of better management at a global level.

The work programme is structured according to the four main activities of the Environment Theme in the Cooperation Specific Programme: i.e. Climate change, pollution and risks; Sustainable management of resources; Environmental technologies; Earth observation and assessment tools. It takes due account of the dynamics of FP6 running activities to address,

[2] UN Framework Convention on Climate Change (UNFCCC), UN Convention in Biological Diversity, UN Convention on Combating Desertification, International Strategy for Natural Disaster Reduction

[3] Kyoto and Montreal protocols

[4] World Summit on Sustainable Development, Global Earth Observation System of System initiative (GEOSS)

[5] Intergovernmental Panel on Climate Change (IPCC), EU Water Initiative, EU Water Framework Directive, European Climate Change Programme II

[6] Thematic strategies on air pollution, pesticides, soil, waste, urban environment, marine environment and sustainable management of resources. Commission Communication on Halting the Loss of Biodiversity by 2010 (COM(2006)216). Green paper on Towards a Future Maritime Policy for the Union.

[7] Environment and Health Action Plan (2004-2010) and Environmental Technologies Action Plan (ETAP)

right from the outset of FP7, those areas which require urgent action. In line with recent policy development, it also gives emphasis to new or reinforced activities:

1. Climate Change and Natural Hazards are of growing public concern and important political priorities of the European Union. Climate change is one of the main policy priorities of the current Commission. Research is needed at EU level to understand the causes, consequences and to predict future evolution of climate change, ozone depletion and other environmental stress factors and to guide and support the implementation of international commitments such as UN Framework Convention on Climate Change (UNFCCC), Kyoto and Montreal protocols, and post-2012 Climate change policy initiatives. It also provides the basis for the development of effective adaptation and mitigation strategies and measures to minimise climate change impacts. Research results will significantly contribute to the Intergovernmental Panel on Climate Change (IPCC) and the United Nations Environment Programme. There are also significant research needs arising from existing and emerging EU level policies, the implementation of the 6th Environmental Action Plan and associated thematic strategies (e.g. air pollution, marine strategy)**,** the European Climate Change Programme-II**,** the Convention on Long Range Transboundary Air Pollution, Directives such as the Water Framework, the EU Water initiative, as well as aspects of the agenda of Technology Platforms.
   Natural hazards research is an essential component to guide and support the implementation of the International Strategy for Disaster Reduction and its framework for action (2005-2015)**,** using a multidisciplinary and integrated approach. At European level research will contribute to related environmental EU activities such as the European civil protection and to other EU research programmes more related to crisis management for natural disasters. It is therefore necessary to consider a robust and comprehensive framework using a multidisciplinary and integrated approach that enables, for individual hazards and for multi-hazards, the integration of the risk reduction chain. Such approach is necessary for any risk management as well as for the development of prevention and mitigation strategies.

2. Environmental Technologies: their strategic importance has been highlighted by the Environmental Technology Action Plan launched in 2004 by the Commission as a joint initiative between DG ENV and DG RTD. Priority in research will be given to innovative system solutions, which integrate front-end with in-process and end-of-pipe components within a coherent organisational framework, having the objective to minimising the environmental impacts associated to economic activities and helping to closing the cycle of materials. For this aim, appropriate methodologies for technology sustainability assessment need to accompany all research activities. Several Strategic Research Agendas of relevant Technology Platforms have contributed to the definition of the programme, and in particular those of the Water Supply and Sanitation, Sustainable Chemistry, Construction (in particular for the focus area Cultural Heritage) and Forestry platforms.

3. Earth Observation, which has gained recent international importance through the GEOSS initiative (Global Earth Observation System of Systems), intends to make the existing observing/monitoring systems more convergent at global level as described in

the GEO 10 year implementation plan[8]. The nature of environmental research is such that Earth Observation data and activities are needed in most of the topics of the environment Theme, which means that many of the environment topics supported through FP7 could be relevant to the Group on Earth Observation (GEO), Global Monitoring for Environment and Security (GMES) and Infrastructure for Spatial InfoRmation in Europe (INSPIRE) initiatives.

4. Research is needed to support sustainable management of natural resources, as referred to in the Thematic Strategies related to the 6th Environmental Action Programme, inter alia soil and marine protection, as well as important directives, including the Water Framework Directive. The work programme supports the recent Communication on Halting the Loss of Biodiversity by 2010 – and beyond: sustaining ecosystem services for human well-being, and its associated Action Plan to 2010 and beyond. The Communication highlights 'The Knowledge Base' as one of the 4 key policy areas for action in order to meet high level EU commitments to halt the loss of biodiversity and secure the recovery of natural systems and habitats. Research priorities are also taking into account international commitments and the role of the European Union in the area of desertification. The Commission will pay particular attention to ensure coherence among these biodiversity and ecosystems-related topics across the work programme.
Marine Sciences and Technologies, which are needed to support the ambitions set out in the Green Paper, "Towards a future Maritime Policy for the Union: A European vision for the oceans and seas". Marine scientific research, technology and innovation supports one of the Commission's primary strategic objectives for 2005-2009, "*the particular need for an all-embracing maritime policy aimed at developing a thriving maritime economy, in an environmentally sustainable manner.*"

5. Environment and Health research activities will support the Environment and Health Action Plan (2004-2010) and are now fully covered by the Environment Theme. Human health in a changing environment is of growing public and policy concern. The Environment and Health research activity is a direct response to meet these concerns and will become a major driving force to meet the goals of the European Environment and Health Action Plan, adopted in 2004. In addition, it will also contribute to a number of other EU policies, which also address environment and health-related issues. These include, among others, possible adverse health outcomes resulting from exposure to industrial chemicals (EU Sustainable development strategy, Community strategy on endocrine disrupters), electromagnetic fields (Programme of Community action in the field of public health), noise (EU noise policy), ambient and indoor air pollution (Thematic strategy on air pollution, Thematic strategy on urban environment), assessment of health impacts of floods (Directive on assessment and management of flood risks)or climate change under European Climate Change Programme-II.

6. Assessment Tools for Sustainable Development: the focus will be on developing tools and knowledge supporting the policy process in its objective to decouple economic growth and environmental degradation, to promote sustainable production and

[8] See http://www.earthobservations.org/docs/10-Year%20Implementation%20Plan.pdf

consumption patterns, and to support the engagement of civil society organisations in research for sustainable development.

Approach

The current work programme builds both on the efforts undertaken in the previous EU Research Framework Programmes, especially the 6th Framework Programme, and on the new momentum created by an updated and upgraded theme on Environment within FP7.

The work programme is the result of a consultation process with the FP7 Advisory Group and research stakeholders, informal exchanges and spontaneous submissions by Member States, and ad hoc meetings with relevant Technology Platforms and Commission services. Earth Observation aspects of the work programme contribute to the GEO (Group on Earth Observation) international initiative activities. Other sources of information have been the International Symposium on Climate Change[9], where the major research questions at stake were discussed, and the Open Stakeholder Consultation on Environment & Health Research Priorities in FP7[10]. In addition to the outcome of the 2004 Euroceans Conference, which led to the Galway declaration[11], and conclusions of a stakeholder conference on Biodiversity and the EU in Malahide (Message from Malahide[12]), a meeting on FP7 orientation for research on pressures on environment and climate as well as research on natural hazards was organised.

The work programme describes the research topics in which project proposals can be submitted in response to the calls for proposals. The description of each topic, in addition to the technical content and scope, includes information about the funding scheme(s), any participation requirements (if relevant) and the expected impact.

The pursuit of scientific knowledge and its technical application towards society requires the talent, perspectives and insight that can only be assured by increasing diversity in the research workforce. Therefore, a balanced representation of women and men at all levels in research projects is encouraged. Many of the activities to be funded under this programme will also make positive contributions to education and training and to raising general levels of awareness of the nature of the environmental research undertaken and the benefits likely to accrue.

Funding schemes The work programme will be implemented through a range of funding schemes as specified in each topic description. The following funding thresholds will apply to different types of projects:

- Collaborative projects in this work programme have been divided into a) small or medium-scale focused research projects, and b) large-scale integrating projects:
  - For small or medium-scale focused research projects, the requested Community contribution shall not exceed 3.5 million Euros, unless otherwise indicated in the topic description. For small or medium-scale focused research projects under the sub-

[9] see http://ec.europa.eu/research/environment/newsanddoc/article_3905_en.htm
[10] see http://ec.europa.eu/research/environment/newsanddoc/article_3907_en.htm
[11] see http://www.eurocean2004.com/pdf/galway_declaration.pdf
see http://www.nbu.ac.uk/biota/messagefrom%20malahide.pdf#search=%22message%20from%20malahide%22

activity *6.4.2 'Forecasting methods and assessment tools for sustainable development taking into account differing scales of observation'* the requested Community contribution shall not exceed 2 million Euros.

– For large-scale integrating projects the requested Community contribution shall be from 4 up to 7 million Euros, unless otherwise specified in the topic description.

- For Networks of Excellence, the requested Community contribution shall be from 4 up to 7 million Euros.
- For "Research for the benefit of specific groups[13]" the requested Community contribution shall not exceed 2 million Euros. This funding scheme will be dedicated to develop scientific knowledge related to activities of civil society organisations (CSO) in order to contribute to public debate. Hence, the funding scheme supports research projects where the bulk of the research is carried out by RTD performers for the benefit of CSOs. *Civil society organisations* are considered to be any legal entity that is non-governmental, not-for-profit, not representing commercial interests, and pursuing a common purpose in the public interest. Professional associations and consultancy organisations are not considered as specific groups under this scheme. *RTD performers* are legal entities able to carry out research on the fields requested by CSOs. Examples of RTD performers are universities, research organisations and industrial companies, including research performing SMEs.

It is important to note that the above mentioned funding thresholds will be applied as eligibility criteria and that the proposals not fulfilling these thresholds are considered as ineligible.

The "coordination and support actions" funding scheme, allows for 2 different types of actions to be financed: a) coordinating type or b) supporting type. The requested Community contribution for these coordination or support actions is expected to be relatively limited in size and scope, as reflected in the relevant topic descriptions. However, in the specific case of ERA-NET projects, the requested community contribution may go up to 2 million Euros.

Forms of the grant to be used for the funding schemes in this part of the Cooperation work programme are stated in Annex 3.

All proposals, including collaborative projects (large-scale integrating projects) and networks of excellence, will be evaluated under the one-step procedure in the Call for proposals related to this work programme. Particularly, in the case of large-scale integrating collaborative projects and networks of excellence only one project will be retained per topic.

Overall in the Theme and in the selection of topics for the work programme 2007 specific emphasis has been given to horizontal issues such as international co-operation, emerging needs and policy relevant research, dissemination actions and SME targeted topics.

- **SME relevant research**

The Theme is designed to attract industrial participants, putting specific emphasis on SME relevant research topics namely within the areas of the Environmental Technologies activity. In this activity SME-targeted collaborative research topics have been introduced in areas which are supporting the Strategic Research agendas of the relevant Technology

[13] Topic ENV.2007.4.2.3.2 in this Work Programme

Platforms[14] and which are specifically designed to encourage SME participation in research and innovation. This approach includes the following topics:

ENV.2007.3.1.1.1. Innovative technologies and services for sustainable water use in industries
ENV.2007.3.1.1.2. Technologies for measuring and monitoring networks
ENV.2007.3.1.2.1. Development and improvement of technologies for data collection in (digital) soil mapping
ENV.2007.3.1.2.2. Development of technologies and tools for soil contamination assessment and site characterization, towards sustainable remediation
ENV.2007.3.1.3.1. Development of integrated waste management technologies for maximising material and energy recovery/recycling of the organic (humid) fraction of municipal solid waste
ENV.2007.3.1.3.2. New technologies for waste sorting
ENV.2007.3.1.3.3. Networking and preparatory action in view of developing cost-effective, environmentally-safe waste treatment technologies and services adapted to the needs of developing countries, within a targeted life cycle approach
ENV.2007.3.1.4.1. Networking and preparatory action in view of control of mercury in industrial processes and products
ENV.2007.3.1.5.1. Low resource consumption buildings and infrastructure
ENV.2007.3.1.5.2. Performance indicators for health, comfort and safety of the indoor built environment
ENV.2007.3.2.1.1. Damage assessment, diagnosis and monitoring for the preventive conservation and maintenance of the cultural heritage
ENV.2007.3.3.1.1. In-silico techniques for hazard-, safety-, and environmental risk-assessment
ENV.2007.3.3.1.2. Defining a long-term research strategy for the full replacement of animal tests for repeat dose systemic toxicity

- **International Co-operation Partner Countries (ICPC) activities**

Particular emphasis has been made to identify specific international co-operation actions covering all the activities of the Theme. It is important to note that the approach taken includes two mechanisms: firstly, opening all the topics of the call for international co-operation and encouraging the ICPC[15] participation in various topics across the Theme, second, through Specific International Co-operation Actions (SICA) across all activities of the work programme whose contents were identified in particular through international workshops. The Specific International Co-operation actions will have an overall indicative budget of 24 million Euros.

The Specific International co-operation actions included in this work programme are:

[14] Technology Platform on Sustainable Chemistry, Technology Platform on Forestry, Technology Platform on Water Supply and Sanitation, Technology Platform on Construction
[15] The list of eligible International Co-operation Partner Countries is attached as Annex 1

ENV.2007.1.1.5.3. Past and future climate change impacts in the Parana-Plata river basin of South America
ENV.2007.1.2.2.3. Health impacts of drought and desertification including related socio-economic aspects
ENV.2007.1.3.3.1. Assessing and managing volcanic threat
ENV.2007.2.1.2.2. River basin twinning initiatives as a tool to implement EU water initiatives
ENV.2007.2.1.2.4. Integrated resource management in international co-operation partner countries
ENV.2007.2.1.3.1. Geographical transect approach to desertification
ENV.2007.2.1.4.3. Biodiversity values, sustainable use and livelihoods
ENV.2007.3.1.3.3. Networking and preparatory action in view of developing cost-effective, environmentally-safe waste treatment technologies and services adapted to the needs of developing countries, within a targeted life cycle approach
ENV.2007.4.1.4.1. Georesource information system for Africa
ENV.2007.4.1.4.2. Improving observing systems for water resource management
ENV.2007.4.1.4.3. GEONETCast applications for developing countries
ENV.2007.4.2.1.3. Tools for impact assessment of environmental policies in international collaboration partner countries

Furthermore, ongoing scientific international co-operation actions as well as activities from previous Framework Programmes, when relevant with the contents of the Environment Theme (including Climate Change), will be continued, building upon the progress and achievements of the past and fostering synergies.

- **Cross-thematic approaches**

The environmental research and activities such as climate change, environmental technologies, biodiversity, ecosystem, marine research and technologies, and assessment tools have an interdisciplinary character. Therefore, special attention has been given to those cross-thematic activities that will contribute to the expectations and objectives of other thematic priorities. This applies to research in the following areas:

- Environment and health related complementary research activities are addressed under the Themes "Health" and "Information and Communication Technologies".
- In the activity of environmental technologies, the water, waste, and built environment related areas are coordinated and complementary with the Theme "Nanosciences, Nanotechnologies, Materials and Production Technologies". Complementary research to risk assessment of chemicals and alternative strategies for testing is carried out in the Theme "Health".
- Biodiversity and ecosystem services-related complementary research is addressed under, in particular, the Theme Food, Agriculture and Fisheries, and Biotechnology as well as in the Capacities programme under the Research Infrastructures activity.
- Marine sciences and technologies related complementary activities are covered, in particular, in the Theme "Food, Agriculture and Fisheries and Biotechnology", in the Theme "Information and Communication Technologies", in the Theme "Energy" and in the Theme "Transport".

- Earth and ocean observation activities are co-ordinated with the Theme "Space" in relation to GMES activities.
- In the sub-activity of assessment tools, there are strong connections with the Theme "Socio-economic sciences and humanities" in the Cooperation specific programme and the "Science in Society" part of the Capacities specific programme, in particular about the sustainable production and consumption patterns, the engagement of civil society, and the interplay between the three dimensions of sustainability (environmental, economic, social).

In the work programme 2007, the following topics are co-ordinated with other relevant Themes:

ENV.2007.3.1.5.1. Low resource consumption buildings and infrastructure
ENV.2007.3.1.5.2. Performance indicators for health, comfort and safety of the indoor built environment
ENV.2007.3.2.1.1. Damage assessment, diagnosis and monitoring for the preventive conservation and maintenance of the cultural heritage
ENV.2007.3.3.1.1. In-silico techniques for hazard-, safety-, and environmental risk-assessment
ENV.2007.3.3.1.2. Defining a long-term research strategy for the full replacement of animal tests for repeat dose systemic toxicity
ENV.2007.4.2.3.2. Engaging civil society in research on sustainable development

- **Dissemination actions**

Special attention will be given to communicating and disseminating research results and outcomes to a wider public, including policy and regulatory authorities. This approach will focus on the establishment of a dialogue between both "research to policy" aspects and "science-society" actors. The dissemination actions are to be implemented through the integration of dissemination and knowledge transfer actions within projects, and through specific dissemination actions, specific Coordination and Support Actions (coordinating type or supporting type) and ERA-NETs, which are focusing on results arising across a range of projects and topics. The following topics are oriented towards dissemination:

ENV.2007.1.1.6.4. Exploitation and dissemination of climate change research results and public perception
ENV.2007.2.2.1.7. Promoting access to information across marine themes
ENV.2007.2.2.1.8. Fostering improved co-operation between marine science and the private sector
ENV.2007.2.2.1.9. Promoting access to and recovery of marine data from previous FP projects
ENV.2007.3.2.2.2. Consolidation and dissemination of results related to cultural heritage
ENV.2007.4.1.2.3. Dissemination and broadcasting of scientific data and information
ENV.2007.5.1.1.1. Transnational co-operation among NCPs

- **ERA-NET**

In the 2007 work programme, the Theme has followed a strategic rather than a "bottom-up" approach as regards the planned ERA-NET activities. The fact that there are quite a big number of ongoing FP6 ERA-NET projects in the area of environment has been taken into account. Therefore, the work programme identifies ERA-NET actions on specific topics which have been received through the consultation phase and on which there seems to be clear demand in addition to the existing ones. The topics below will be subject to a joint call that will be launched separately, (FP7-ERANET-2007-RTD) with a requested Community contribution up to 2 million Euros per project:

ENV.2007.1.2.3.1. ERA-NET for environment and health
ENV.2007.3.2.2.1. ERA-NET for the preservation of the tangible cultural heritage

- **Policy relevant research and emerging needs**

The policy relevant research and emerging needs are considered fundamental elements for the environmental research Theme and are referred to in all activities. Therefore, the approach is addressing the significant research needs arising from existing EU-level policies, such as the implementation of the 6th Environmental Action Plan and associated thematic strategies, programmes and directives, as well as research needs arising from the implementation of international commitments at the EU-level.

The "policy relevant and emerging needs" related topics are:

ENV.2007.1.1.5.1. Climate change impacts and adaptation strategies in water policies
ENV.2007.1.1.6.1. Full costs of climate change
ENV.2007.1.1.6.3. Impacts and feed-backs of climate policies on land use and ecosystems in Europe
ENV.2007.1.2.2.1. European network on human biomonitoring
ENV.2007.1.2.3.2. Geographical information systems in support for environment and health research
ENV.2007.1.3.3.3. Investigating Europe's risk from droughts
ENV.2007.2.1.2.1. Assessing the ecological status of water bodies
ENV.2007.3.1.2.1. Development and improvement of technologies for data collection in (digital) soil mapping
ENV.2007.3.1.2.2. Development of technologies and tools for soil contamination assessment and site characterization, towards sustainable remediation
ENV.2007.3.1.3.1. Development of integrated waste management technologies for maximising material and energy recovery/recycling of the organic (humid) fraction of municipal solid waste
ENV.2007.3.1.4.1. Networking and preparatory action in view of control of mercury in industrial processes and products
ENV.2007.3.1.5.1. Low resource consumption buildings and infrastructure
ENV.2007.3.1.5.2. Performance indicators for health, comfort and safety of the indoor built environment

ENV.2007.3.3.1.1. In-silico techniques for hazard-, safety-, and environmental risk assessment
ENV.2007.4.2.1.2. Improved tools to analyse the sustainable development implications of the EU financial perspective revision (2008-2009)

Other activities

- Risk Sharing Finance Facility (RSFF)

  In addition to direct financial support to participants in RTD actions, the Community will improve their access to private sector finance by contributing financially to the 'Risk-Sharing Finance Facility' (RSFF) established by the European Investment Bank (EIB).

  The Community contribution to RSFF will be used by the Bank in accordance with eligibility criteria set out in Annex 4. RSFF support is not conditional on promoters securing grants resulting from calls for proposals described herein, although the combination of grants and RSFF-supported financing from EIB is possible.

  In accordance with the 'Cooperation' Specific Programme, which stipulates that the Community contribution to RSFF will be funded by *proportional contributions of all Themes, except Socio-economic Sciences and the Humanities*, the Commitment Appropriations for the Environment (including Climate Change) Theme to RSFF in 2007 will be EUR 9.95 million Euros. This amount will be committed entirely in 2007.

  The use of the Community Contribution from the Specific Programme 'Cooperation' will be on a 'first come, first served' basis and will not be constrained by the proportional contribution of Themes. Further information on the RSFF is given in Annex 4.

- National Contact Points (NCP) for Theme 6 "Environment"

  A Network of National Contact Points is instrumental for helping access to FP7 calls, and to lower the entry barrier for newcomers and raise the average quality of submitted proposals. A topic for supporting a transnational NCP network through a coordination and support action is included in the first call of 2007.

- Monitoring, Evaluation and Impact Assessment

  The Theme "Environment" will comply with the prevailing requirements for monitoring, evaluation, and impact assessment. This may involve studies and surveys (as appropriate implemented through public procurement) as well as appointing experts or groups of experts. The overall commitment appropriations for this activity in 2007 will be up to 280.000 EUR, of which maximum 250.000 EUR for public procurement.

  The work will include the ex-post impact assesment of environment activities under the 6th Framework Programme and studies of the longer term impact of Community funding of research in certain areas/ disciplines/ sectors, including from previous Framework Programmes. This assessment will be subject to one contract following a public procurement procedure, to the extent possible by using an Framework contract already

existing in the Commission for evaluation studies. The call for tender is scheduled for second quarter 2007 in view of contract signature in the second half of 2007.

- Support to the 2007 activities of the GEO Secretariat

  To ensure the implementation of the GEOSS according to its annual work plan and the continuity of the participation of Europe in GEO, the Commission will pay on behalf of the Community which is member of the Group, a yearly contribution to GEO Secretariat (Hosted by World Meteorological Organisation) based on a Commission Decision, as a grant to a named beneficiary (0.6 M €).

- External expertise

  - The use of external assistance (by "Project Technical Assistants") as necessary to enable detailed, prompt, pro-active, and scientifically competent following of the projects by the Commission (to be implemented through public procurement).
  - The use of appointed external experts for the evaluation of project proposals and, where appropriate, for the reviewing of running projects.
  - The set up of groups of external experts to advise on or support the design and implementation of Community research policy.

II CONTENT OF CALL IN 2007

Activity 6.1. CLIMATE CHANGE, POLLUTION, AND RISKS

Integrated research addressing the functioning of climate and the earth system, including the ocean and the polar regions, is needed to determine the causes of changes in the past and to predict better their likely future evolution. This will enable the development of effective adaptation and mitigation measures to climate change and its current and future impacts. The projects that are already being supported by the Sixth Framework Programme have been taken into consideration for the choice of the areas open for 2007. The focus will be on analyses of pressures on the environment and climate from natural and anthropogenic emissions and improvement of our understanding of the complex climate system. Ocean acidification, possible changes of the thermohaline circulation deserve particular attention. Advanced climate change models from the global to sub-regional scales now permit applications to assess possible environmental changes, ecological and socio-economic impacts and critical thresholds. Observation, analysis and modelling must be used to assess climate induced changes to atmospheric composition, greenhouse gases and to the water cycle, on soil, and the cryosphere, impacts on ecosystems, feed-back mechanisms and abrupt changes as well as the occurrence of extreme events are also of prime interest.

Multidisciplinary research on interactions of environmental risk factors and human health is needed to support the Environment and Health action plan and the integration of public health concerns and disease characterisation related to emerging environmental risks. Research will focus on multiple exposures via different exposure routes, identification of pollution sources, pathways and possible preventive actions. Important is also the detection of new or emerging environmental stressors, their potential health effects, quantification and cost-benefit analysis of environmental health risks and indicators for prevention strategies.

Management of disasters related, inter-alia, to climate and geological hazards requires improved knowledge, methods and an integrated framework for the assessment of hazards, vulnerability and risks. Furthermore a multi-risk approach combined with spatial planning, mapping and modelling are needed for the development of prevention and mitigation strategies. Multidisciplinary/interdisciplinary research aiming to better understand the underlying processes should be pursued to improve detection, prediction and forecasting methods. Environmental and societal resilience as well as damages due to major natural hazards need to be quantified.

Sub-activity 6.1.1. Pressures on environment and climate

Indicative available budget: 36 M€

Area 6.1.1.1. The Earth System and Climate: Functioning and abrupt changes

ENV.2007.1.1.1.1. Stability of the Thermohaline Circulation

Integrated observation and process studies in key regions (e.g. the Arctic and sub-Arctic), modelling and palaeo-studies to assess the risk of the breakdown or sudden reduction of the thermo-haline circulation. Feedback with stability of ice-sheets in polar regions, changes and variability in atmospheric circulation and the hydrological cycle should be included. The participation of international cooperation partner countries (e.g. Russia) is encouraged. This topic is also a contribution to the International Polar Year.

Funding scheme: collaborative projects (large-scale integrating projects) (Community contribution from 4 up to 10 million Euros)

> ***Expected impact****: Much improved quantification of the risk, time horizon and possible scenarios for Thermohaline Circulation breakdown and related abrupt/rapid climatic change; understand the influence of ice sheets melting on THC; predict the THC in the future.*

Area 6.1.1.2. Emissions and Pressures: Natural and anthropogenic

ENV.2007.1.1.2.1. Megacities and regional hot-spots air quality and climate

Impacts of air pollution from megacities and large air-pollution "hot-spots" in Europe and elsewhere. Integrated research on emissions, their local impacts with special emphasis on air quality and associated risks, and their regional to global impacts. Assessment of mitigation options and quantification of impacts from polluted air-masses on larger scale atmospheric dynamics (physics and chemistry, hydrological processes, long-range/hemispheric transport etc.) as well as other important feedbacks between air quality, climate and climate change. The participation of international cooperation partner countries is encouraged.

Funding scheme: collaborative projects (small or medium-scale focused research projects)

> ***Expected impact****: A better quantification of air quality, mitigation options and availability of more reliable tools for prediction of air pollution in cities. Support to EC Thematic Strategy on Air Pollution and Air Quality regulation. Better quantification on regional and global links between air pollution, climate and climate change necessary to underpin mitigation and other policy initiatives.*

Area 6.1.1.3. The Global Carbon cycle - GreenHouse Gas budgets

ENV.2007.1.1.3.1. Ocean acidification and its consequences

Temporal and spatial changes of ocean acidification due to increasing CO2 uptake. Quantification of the impacts of the acidification on marine biota and their physiology, and marine ecosystems. Feedback to the carbon and other key element cycles, to climate change and the Earth system over the next decades to centuries. Process and experimental studies and field work should be integrated in biogeochemical, ocean sediment, circulation and climate models.

Funding scheme: collaborative projects (large-scale integrating projects)

> ***Expected impact****: Impacts of ocean acidification on ocean ecosystems and related feedback to the carbon cycle; determination of pH tipping points; a better understanding and description of the carbon cycle in coupled ocean-climate models.*

Area 6.1.1.4. Future Climate

Not open in 2007.

Area 6.1.1.5. Climate Change Natural and Socio-economic Impacts

ENV.2007.1.1.5.1. Climate change impacts and adaptation strategies in water policies

The aim is to study European and international adaptation measures and strategies related to climate change impacts and how these are taken into account in water policies. The project should bring together scientific and policy experiences on the existing and/or missing links between climate change and water management. It will contribute to; the identification of research needs on climate change impacts on water cycle and resources; to the development and application of methodologies for adaptation measures to climate change; to the development of scenarios of water demand and to potential implementation on water policies. (**Policy relevant topic**)

Funding scheme: coordination and support actions (coordinating type or supporting type)

> ***Expected impact****: To provide a coherent framework on adaptation strategies of climate change impacts on water. The project will also give the fundamentals on the European/international adaptation strategies that water policy has to take into account when considering climate change impacts. Furthermore, it will support the implementation of the EU water policy, including its relation to other sectors and policies, and the identification of research gaps in the field.*

ENV.2007.1.1.5.2. Climate change impacts on vulnerable mountain regions

The impacts of climate change on physical, biological and socio-economic systems of mountain regions should be quantified from time periods covering next decades to a century including field campaigns and modelling studies. Emphasis should be given to water and energy supply, melting of glaciers, tourism, forestry and agricultural production, and services from semi-natural and natural (pristine) ecosystems. Research should also address the resulting social and economic impacts. Focus should be on regions with particularly high vulnerability in Europe and worldwide. Participation of international partner countries is encouraged.

Funding scheme: collaborative projects (large-scale integrating projects)

> ***Expected impact****: Identification of key criteria to identify sensitive mountain areas vulnerable to climate change taking into account sectors and impacts. Know-how and integrated models and methodologies to quantify climate change impacts that can be applied in different vulnerable mountain regions of the world.*

ENV.2007.1.1.5.3. Past and future climate change impacts in the Parana-Plata river basin of South America

Observations and modelling studies at both regional and continental scale to quantify past and predict future climate changes and impacts in the Parana-Plata basin. Emphasis in climate change impacts should be given to floods, hydrological systems, land-use and agriculture, deforestation and needs to assess the social and economic implications. Adaptation measures to future climate risks and impacts should be also considered**. (Specific International co-operation action)**

Funding scheme: collaborative projects (small or medium-scale focused research projects)

> ***Expected impact:*** *Strengthening of the cooperation between European and South American multidisciplinary research communities by studying climate change impacts in a basin which largely involves the greater part of the population, economy, agriculture, hydropower production of the five major South American countries concerned. Improved prediction capacity of the climate change impacts, which will result in economic, environmental and social benefits for the region.*

Area 6.1.1.6. Response strategies: Adaptation, Mitigation and Policies

ENV.2007.1.1.6.1. Full costs of climate change

Quantification of damage, adaptation and mitigation costs for global emission scenarios including those that stabilize atmospheric concentrations covering countries important in international climate negotiations. This includes a coherent, up-to-date representation of

socio-economic drivers. Emissions of reactive gases and, air pollutants as well as changes in land cover must be considered. Mitigation costs are to reflect (induced) technological change and need to include non CO_2 greenhouse gases and sinks and consider recent abatement technologies. Emphasis should be on better estimates for damage and adaptation costs. Damage estimates are to include market damage, non-market damage, catastrophic events and damage related to changes in air-quality (co-benefits). Damage needs to be expressed in physical terms and, to the extent possible, monetary terms and needs to cover all relevant sectors. Explicit treatment of uncertainty is essential. Energy aspects need to be covered. The participation of international partners is encouraged. (**Policy relevant topic**)

Funding scheme: collaborative projects (small or medium-scale focused research projects)

> ***Expected impact****: More complete, updated assessment of cost of mitigation, adaptation and damage of climate change, especially with respect to market and non-market damages, damages related to catastrophic events and damage due to changes in air-quality. Input to and support for EU policies on climate change in international negotiations and support for air pollution policy.*

ENV.2007.1.1.6.2. Effectiveness of adaptation and mitigation measures related to changes of the hydrological cycle and its extremes

Quantify the efficiency (cost and benefits) of current and novel adaptation and mitigation measures related to changes of the hydrological cycle and its extremes in Europe. Analysis of the social and economic implications. Develop (adaptive) management strategies (including considerations on resilience and mitigation measures) for risks caused by long term changes of the hydrological cycle taking into account economic and social pressures (e.g. population and GDP growth, land use) under current and future climate conditions.

Funding scheme: collaborative projects (small or medium-scale focused research projects)

> ***Expected impact****: Quantitative assessment of the efficiency of current and future adaptation and mitigation measures to hydrological changes and related extremes in Europe. Support for EU and non-EU research activities and policies as a response to climate change, in particular on adaptation.*

ENV.2007.1.1.6.3. Impacts and feed-backs of climate policies on land use and ecosystems in Europe.

Research should assess the impacts of climate (and other sectoral) policies on land use and ecosystems and the resulting feed-back on the climate system. Regional climate models should be coupled with land use models to improve the representation of explicit biophysical and economic mitigation and adaptation strategies in agriculture and forestry. Improved methodologies should include explicit crop/trees growth models that have sufficient, sub-national spatial detail to estimate the responses and adaptation possibilities of crops and trees to both scenarios of extreme climate events and changes in weather patterns. Models should include scenarios for the distribution and pressures from socio-economic drivers with

sufficient geographical details. Impacts of climate mitigation measures need to be covered with sufficient details on bioenergy sources and pathways. Research should help in assessing and evaluate the impacts of alternative policy scenarios and estimating the associated costs and benefits of the policies. **(Policy relevant topic)**

Funding scheme: collaborative projects (small or medium-scale focused research projects)

> ***Expected impact:*** *Assessment of the efficiency of current and future land use adaptation and mitigation processes, including carbon sinks and biomass/-fuel production. Identification of the adaptation induced by policies, in particular by the Common Agricultural Policy, Rural development Strategy, EU Forestry Strategy and Forest Action Plan, and in general EU policies on climate change.*

ENV.2007.1.1.6.4. Exploitation and dissemination of climate change research results and public perception

This action mainly organised as a large Conference should promote the exploitation of EU research results in the area of climate change, to discuss public knowledge and perception of research, and responses regarding the risks associated with climate change. This action will address adaptation to climate change, in particular concerning the possible and expected social impacts, the awareness of citizens to research results and society's preparedness. The conference will bring together actors from different disciplines.

Funding scheme: coordination and support actions (supporting type)

> ***Expected impact:*** An in depth discussion on the exploitation and dissemination of research results related to climate change, the public knowledge and perception of the research results and suggestions for necessary related actions. The proposals should be able to demonstrate that they will be able to obtain the widest audience to the Conference through registered participants from different disciplines and through the media, and that they will be able to obtain a wide and balanced participation for all European countries and beyond.

Sub-activity 6.1.2. Environment and Health

Indicative available budget: 19 M€

Area 6.1.2.1. Health effects of exposure to environmental stressors

ENV.2007.1.2.1.1. Indoor air pollution in Europe: an emerging environmental health issue

The aim is to provide systematic information about indoor air pollutants across Europe and their potential long-term health impacts. The project will carry out epidemiological and toxicological studies on mechanisms linking exposure to indoor air pollution under different conditions and health effects, with special attention to pollutants specific to indoor air environments, vulnerable groups and multiple exposures. The studies can include innovative measurement strategies, sampling techniques, modelling and database building on concentration of indoor air pollutants.

Funding scheme: collaborative projects (small or medium-scale focused research projects)

> ***Expected impact****: New mechanistic and pollutant concentration data, harmonised models and sampling approaches to estimate indoor air pollution and related health impacts, taking into account socio-economic factors. Improved risk assessment data (e.g., validated biomarkers), usable in regulation and biomonitoring, communicated to relevant stakeholders (e.g., city planning, construction). Support for policies such as the Thematic Strategy on Air Pollution, Thematic Strategy on Urban Environment, and Environment and Health Action Plan.*

ENV.2007.1.2.1.2. Environmental factors and their impact on reproduction and development

The aim will be to assess environmental influences on long-term reproductive health and developmental parameters using integrated environmental and health data. The issues of long latencies of effects following exposures at critical time points and interplay between multiple factors (e.g., mixtures of contaminants) should be considered. Developing tools of toxicogenomics and -proteomics including validated biomarkers should be integrated with statistical and modelling studies usable in biomonitoring and epidemiological studies (e.g., European wide parent-child birth cohort). Emphasis should be on contaminants with widespread potential for exposure and persistence. In vitro and animal models should be taken advantage of where possible. International collaboration beyond the EU will be encouraged. The role of gender should be taken into account.

Funding scheme: collaborative projects (small or medium-scale focused research projects)

Expected impact: *New mechanistic and toxicological data on how environmental contaminants affect long-term reproductive and developmental parameters including transgenerational effects. Policy support for the implementation of the Sustainable Development Strategy, the Environment and Health Action Plan and the Community Strategy on Endocrine Disrupters. The project should support improved risk assessment of endocrine disrupters.*

Area 6.1.2.2. Integrated approaches for environment and health risk assessment

ENV.2007.1.2.2.1. European network on human biomonitoring[16]

The aim is to carry out activities to coordinate and harmonise research and protocols on data collection, methodologies and models, in view of integrating human biomonitoring data with health/environment monitoring data and to allow for extrapolation of human biomonitoring results with health effects. The project will include validation of precise and non-invasive biomarkers of exposure, effect, and susceptibility, and can include small-scale pilot studies. Account should be taken of recent initiatives in the field, including relevant pollutant selection, and it should support the aims of the EU Environment and Health Action Plan on human biomonitoring. It can propose priorities for exposure reduction strategies and should provide recommendations for consideration of ethical issues in the pilot study. (**Policy relevant topic**).

Funding scheme: network of excellence

Expected impact*: Coordinated approach to human biomonitoring in Europe and development of validated biomarkers usable for human biomonitoring, discussed with relevant government bodies and regulatory authorities. Policy support for the implementation of the Environment and Health Action Plan, especially research aspects of Action 3 (human biomonitoring pilot project).*

ENV.2007.1.2.2.2. European cohort on air pollution

The aim will be to increase our knowledge on especially long-term health effects caused by air pollution from different sources and to develop more reliable biomarkers of exposure and effect, usable in regulatory settings and biomonitoring. Particular vulnerable groups (children, elderly etc), genetic susceptibilities including gender and socioeconomic factors should be taken into account. Combined exposures (air pollution, noise, chemicals etc) should be considered and exposure models validated. Harmonised study protocols should be developed. Links to other international research initiatives are encouraged.

Funding scheme: collaborative projects (large-scale integrating projects)

[16] Please also see 'Health' Theme Topic HEALTH-2007-2.1.1-1: Networking biobanking initiatives across Europe: developing standards and norms for existing and future human sample biobanks.

Expected impact*: New and improved epidemiological and risk assessment data (e.g., validated biomarkers) that regulators can use, made available in the public domain. Policy support for the implementation of the Thematic Strategy on Air Pollution, Thematic Strategy on Urban Environment and the Environment and Health Action Plan.*

ENV.2007.1.2.2.3. Health impacts of drought and desertification including related socio-economic aspects

The aim is to use Geographic Information Systems (GIS) approaches to identify populations, especially those in the International Collaboration Countries around the Mediterranean basin, with potential exposure to environmental hazards resulting from drought and water scarcity including desertification and dust (storms). Exposure data will be linked to relevant disease outcomes, e.g., vector and waterborne diseases. The study shall consider the valuation of socio-economic factors such as those related to land use and urbanisation. Links should be established to ongoing research and other international activities, in particular those in support of the UN Convention to combat Desertification and the Global Earth Observation (GEO) initiative. **(Specific International co-operation action)**

Funding scheme: collaborative projects (small or medium-scale focused research projects)

Expected impact*: New and improved data on human health and socioeconomic impacts of water scarcity caused by advancing desertification, communicated in easily accessible form in the public domain and discussed with governmental and non-governmental stakeholders for consideration for their own planning and adaptation/remediation strategies. Support to international initiatives such as GEO and the UN Convention to combat Desertification to solve emerging environmental issues at regional level.*

Area 6.1.2.3. Delivery of methods and decision support tools for risk analysis and policy development

ENV.2007.1.2.3.1. ERA-NET[17] for environment and health

The aim will be to bring together national programmes and managers of environment and health research in EU member states, in order to develop focused joint research activities integrating national and regional expertise on particular environment and health issues.

Funding scheme: coordination and support actions (coordinating type) (Community contribution up to 2 million Euros)

Expected impact*: Co-ordination of national environmental and health research activities at the EU level, to identify and contribute to coordinated research*

[17] This topic is subject to a joint call for ERA-NETs across the themes (FP7-ERANET-2007-RTD)- See Annex 4

programmes on specific environment and health topics at the EU level. To provide policy support for the implementation of the Environmental and Health Action.

ENV.2007.1.2.3.2. Geographical information systems in support for environment and health research

The aim will be to create a coordination action to explore how environmental and health data can be best used to produce risk maps for selected health outcomes by using high-resolution Geographic Information Systems (GIS) approaches, focusing mainly on ground observation. The project will stimulate epidemiological and statistical approaches for elucidating the geographic relationship between environmental risks and exposures and related diseases of high public health relevance. Statistical methods will be developed to account for uncertainty due to potential confounding factors, e.g., measurement errors and missing data. Interdisciplinary studies incorporating the expertise of biostatisticians, epidemiologists, environmental scientists, medical geographers and computer specialists will be necessary. **(Policy relevant topic)**

Funding scheme: coordination and support actions (coordinating type)

Expected impact*: New and improved methods to evaluate risks on selected environmental factors contributing to important environmental disease(s) through use of GIS technologies. Also in support for the implementation of Global Earth Observation System of Systems (GEOSS) initiative and the Environment and Health Action Plan.*

Sub-activity 6.1.3. Natural hazards

Indicative available budget: 13 M€

Area 6.1.3.1. Hazard assessment, triggering factors and forecasting

ENV.2007.1.3.1.1. European storm risk

Storms trigger, on different spatial and temporal scales, natural hazards related to heavy wind, water, snow and ice precipitation, storm surges and landslides. Research is needed to: analyse past European storm events based on a homogeneous database of occurrence and related socio-economic damages, study key circulation structures and changes in dangerous storm occurrence with size and time and their connection to climatological proxy indicators. Analyse and map storm related risks in sensitive European regions (including, when applicable, the outmost regions) taking into account intensity, spatial extent, duration, hazard interaction effects. Consider regional climate change impacts using output from related research activities. Contribute to the development of a probabilistic mapping and early

warning and information system for the multiple risks triggered by storms, supporting long-term disaster reduction as well as timely relief operations.

Funding scheme: collaborative projects (small or medium-scale focused research projects)

> ***Expected impact****: Capitalisation and integration of knowledge and know-how; enhanced capacity for disaster anticipation. Better identification, in interaction with key stakeholders, of the sensitive regions of Europe in order to enable preparedness.*

Area 6.1.3.2. Vulnerability assessment and societal impacts

ENV.2007.1.3.2.1. Frame for better vulnerability assessment

For natural hazards and disasters, vulnerability related concepts are not yet well documented and quantitatively understood. A conceptual framework and appropriate methods are required to better assess vulnerability to hazards of society, and of built and natural environments. Capacity to assess social, economic and ecological damages has to be improved and key variables for the determination of vulnerability for the various elements at risk must be identified. Risk scenarios, with emerging indicators and indices, should be established, using a probabilistic approach where appropriate, accounting for uncertainties, depending both on the temporal and the spatial scale. Testing of the applicability of the vulnerability assessment scheme should also be explored.
No specific hazard is suggested, proposers should justify the choice(s) made.

Funding scheme: collaborative projects (small or medium-scale focused research projects)

> ***Expected impact****: Achieve a standard approach for a better estimation and measure of vulnerability related to natural hazards; improved risk estimation and better promotion of disaster resilience.*

Area 6.1.3.3. Risk assessment and management

ENV.2007.1.3.3.1. Assessing and managing volcanic threat

The research work will contribute to the work of scientists and civil protection authorities to enhance a common strategy to fight volcanic threat. Within a multidisciplinary context and capitalising on previous and ongoing research, the project should improve volcanic risk assessment and management capacities in justified active volcanic regions in and outside Europe. The project should develop common new methodologies, risk criteria, protocols, procedures and scenarios to evaluate and manage volcanic hazards and risks. Uncertainties, possible multi-risks effects need to be considered. The project should also improve tools and prevention methods useful for end users such as territorial planning, innovative risk mapping and help the development of mitigation guidance. Focused educational and information

products should facilitate the dissemination of prevention/protection action. **(Specific International co-operation action)**

Funding scheme: collaborative projects (small or medium-scale focused research projects)

> ***Expected impact****: Enhance guidance for effective integrated approach toward volcanic risk. Advance state-of the- art in harmonisation of approaches and protocols, acquisition of tools and methods to support alert and civil protection authorities and stakeholders, in Europe and outside Europe, especially in ICPC. Sharing and transfer of know how to threatened regions and support to the UN strategy for disaster reduction efforts.*

ENV.2007.1.3.3.2. Harmonising avalanche forecasting, risk mapping and warning

Assess the snow cover variability and its influence on the release probability of avalanches. Compare and improve statistical and modelling tools and forecasting systems. Develop harmonized and innovative hazards, vulnerability and risk mapping methodologies, interregional information systems and warning procedures for EU mountain regions. Develop coordinated risk assessment methods and procedures in the EU countries. Improve and develop common statistical methods for quantifying the uncertainty in hazard mapping and risk analysis. Develop methods to take into account the role of risk control measures in hazard zone mapping. Promote educational and training programmes in order to generate best practices, guidelines and common procedures and expertise.

Funding scheme: collaborative projects (small or medium-scale focused research projects)

> ***Expected impact****: Improved rationalisation and enhance coordination of the scientific approaches towards avalanches forecasting and risk management capacity in the mountain regions of Europe. Improvement of the prevention strategies that will be of direct use for end users such as civil protection authorities.*

ENV.2007.1.3.3.3. Investigating Europe's risk from droughts

Establish a network to assess the state of the art in research related to droughts in Europe, to identify research needs as a contribution to the development of a European drought policy in regard to Europe's risks and vulnerability. Climate trends also should be taken into account. Analyse key studies and initiatives, within Europe and in relevant areas outside Europe, to assess and estimate the economic, social and environmental impacts of droughts. **(Policy relevant topic)**

Funding scheme: coordination and support actions (coordinating or supporting type)

> ***Expected impact****: Short to long term vision on the research needs and potential contributions to a European drought policy taking into account current climate change knowledge, social and economic implications and interactions with other*

policies. Provide information on possible impacts of droughts and guidance for stakeholders in the area of planning, implementation and scenarios.

Area 6.1.3.4. Multi-risk evaluation and mitigation strategies

ENV.2007.1.3.4. 1. European (multi) hazard database analysis

Analyse the different European/regional/national natural hazard databases. Provide information on the temporal period covered by each database on their information content and on data policy/access rights. Assess the compatibility of different databases. Identify weaknesses of current databases and provide suggestions for development of an EU-wide multi hazard database keeping in mind minimum accuracy, coverage and completeness standards. Identify and analyse relevant case studies and projects dealing with quantitative multi-hazard assessment enabling the analysis and development of best practices in this field.

Funding scheme: coordination and support actions (supporting type)

Expected impact*: Enable an exhaustive analysis of all existing and missing datasets and information necessary for disaster assessment; establishment of a conceptual structure that will help the natural hazards communities in their research efforts and in a long term perspective. Stimulate synergy and exchange with existing national efforts.*

Activity 6.2. SUSTAINABLE MANAGEMENT OF RESOURCES

Research will improve the knowledge bases and develop advanced models and tools needed for the sustainable management of resources, conservation of biodiversity and sustaining of ecosystem services, and the creation of sustainable consumption patterns in order to reduce the environmental impact of resource use. This will enable the prediction of the dynamics of ecosystems and their restoration, and the mitigation of degradation and loss of important compositional, structural and functional elements of ecosystems (for biodiversity, water, soil and marine resources) Soil research will take into account the recommendation from the stakeholder consultation on the Thematic Strategy for Soil Protection. Research will also address sustainable management of forests and the urban environment including planning, and waste management. Specific research is also required to improve our understanding of the impacts of human activities on the ocean and seas and on the resources of the marine environment, including the pollution and eutrophication of regional seas and coastal areas. Research activities in aquatic environments, deep sea ecosystems and seabed will be carried out in order to observe, monitor and predict the behaviour of this environment and enhance understanding of the sea and the sustainable use of ocean resources and will facilitate the achievement of the good environmental status of marine waters by 2021 consistent with the Strategy for the Marine Environment.

Sub-activity 6.2.1. Conservation and sustainable management of natural and man-made resources and biodiversity

Indicative available budget: 26 M€

Area 6.2.1.1. Integrated Resource Management

Not open in 2007.

Area 6.2.1.2. Water resources

ENV.2007.2.1.2.1. Assessing the ecological status of water bodies

Development of *methodologies, models, integrated indicators and multi-species metrics to be used in integrated assessment of the ecological status* of water bodiesto evalutate and quantify the combined effects of pressures due to global change (land use, pollution, climate change) and catchment management measures. All surface water categories should be addressed, however, new data collection should focus on lakes, transitional and coastal waters.
Inter-calibration of methodologies used for biological quality assessment, definition of reference conditions and thresholds for ecological quality classes to promote EU-wide harmonisation in the area and to underpin the characterisation and status classification of the water bodies. Specific attention must be paid to uncertainties, their quantification and inclusion in the assessment of the current state of the water body and in the predicted outcomes of management measures including their cost-effectiveness. **(Policy relevant topic)**

Funding scheme: collaborative projects (large-scale integrating projects)

***Expected impact**: The research should contribute in a concrete way to the implementation of the Water Framework Directive and assist the member states to establish the programme of measures as foreseen by WFD and the subsequent assessment of these measures. Intercomparison of methodologies is expected in view of identifying the most relevant one(s) for a coherent implementation by all member states.*

ENV.2007.2.1.2.2. River basin twinning initiatives as a tool to implement EU water initiatives

Integrated water resources management research activities carried out on twinned catchments/river basins from Europe and catchments from international cooperation partners to underpin the implementation of Integrated Water Resources Management (IWRM) in these countries in compliance with EU Water Initiative objectives and Millennium Development Goals targets. **(Specific International co-operation action)**

Funding scheme: collaborative projects (small or medium-scale focused research projects)

***Expected impact**: Support to EU Water Initiative in the context of international cooperation. Such collaborations will have to pay particular attention to constructive engagement with the entire spectrum of societal actors. Accrued emphasis has to be placed on communicating the research process and its results to all societal actors to make the research policy relevant and enhance its impact. Target areas for the 2007 call: Africa and South America.*

ENV.2007.2.1.2.3. Temporary water bodies management

Research on temporary water bodies, their spatial extent and their temporal dynamics in semi-arid (Mediterranean) and arid climatic/hydrologic conditions. Assessment of the role of temporary (ephemeral) water bodies in the dynamics of nutrients, toxic substances and organic matter. Assessment and management of flood risk for temporary (ephemeral) water bodies. The participation of Mediterranean Partner countries is encouraged.

Funding scheme: collaborative projects (small or medium-scale focused research projects)

***Expected impact**: Better understanding of the dynamics of temporary water bodies by researchers, water managers and environmentalists, research. S&T support to the development of integrated water resource management strategies by relevant national and regional authorities in line with the EU Water Framework Directive in geographical areas where these temporary water bodies play an important role in the aquatic systems.*

ENV.2007.2.1.2.4. Integrated resource management in international co-operation partner countries

Contribution to the development and testing of innovative concepts for natural resource management including water, agriculture resource and energy resource, in developing countries with respect to safeguarding and or fostering economic development in a restricted biosphere. Contribution for developing integrated analytical approaches and decision support systems which should allow stakeholders and decision makers to meet the often contradictory challenge of integrated resource planning without compromising natural resources of future generations. Targeted countries for the 2007 call: Latin America. **(Specific International co-operation action)**

Funding scheme: coordination and support actions (supporting type)

> ***Expected impact:*** *Fostering participatory and constructively engaged international co-operation in the field of integrated resource management in order to support attaining the Millennium Development Goals (MDG) targets and the need to preserve and use resource in the most possible way and getting research results considered by the spectrum of societal actors in Latin American cooperation partner countries.*

Area 6.2.1.3. Soil research and desertification

ENV.2007.2.1.3.1. Geographical transect approach to desertification

Research should focus on development of protection and restoration methods, strategies and measures, as well as best practices, operational analytical methods and modelling studies to combat desertification and land degradation: 1) Furthering knowledge of processes (geographical transect approach taking into account the links between physical and socioeconomic processes) in particular evaluating the costs and benefits of any measures that could be proposed and 2) Knowledge transfer, addressing the stakeholders, including the institutional level. **(Specific International co-operation Action)**.

Funding scheme: collaborative projects (large-scale integrating projects)

> ***Expected impact****: S&T support to EU stakeholders and the relevant organisations in partner countries for developing and/or improving their strategies, planning and implementation plans against desertification and thus contribute directly to the UNCCD Convention for desertification, to the EU Soil Thematic strategy and to the science programme of the "Committee for Science and Technology (CST)" the mandate of which is to support scientifically COP (Conference Of The Parties) with information and advice on scientific and technological matters relating to combating desertification and mitigating the effects of drought*

Area 6.2.1.4. Biodiversity

Consortia in this sub-area are especially encouraged to include partners and field sites in the ultra-peripheral regions of Europe and International Co-operation Partner Countries.

ENV.2007.2.1.4.1. Contribution of biodiversity to ecosystem services

Understanding how biological diversity terrestrial, inland waters and marine - at European and international levels - contributes to ecosystem goods and services and to livelihoods. Based on major trends in biodiversity and patterns of species interactions, work should contribute to better understanding of the values of and human dependence on biodiversity, the implications of change, and an initial evaluation of the costs and social and environmental consequences of not halting biodiversity loss. In addition, it should be considered how these values can be realised through payments for ecosystem services (PES) such as habitats banking. Institutional contexts, cost and benefits of strategies to preserve, restore and use biodiversity in a more sustainable way should also be assessed. The topic is important in the context of European competitiveness and sustainable development in Europe and elsewhere because the loss of biodiversity will impact upon the provision of goods and services. Major economic sectors depending/impacting on biodiversity have to be considered (agriculture, forestry, fisheries, transport, trade, tourism, industry).

Funding scheme: collaborative projects (small or medium-scale focused research projects)

> ***Expected impact****: Better quantification of the cost of loosing biodiversity, e.g. in terms of products and services, use and non-use values, and ultimately in terms of reduced productivity and welfare. Increased understanding by researchers, regional planners and political and economic actors, including civil society organisations active in the economic sectors under consideration through public access to information should make it possible to develop inclusive management strategies that will protect or restore ecosystems and help maintain the provisions of the ecosystem services upon which economic competitiveness and welfare depend. Communicating research process and results in a constructively engaged way to the full spectrum of societal actors is of utmost importance to maximise its policy relevance and impact.*

ENV.2007.2.1.4.2. Use of natural resources: the impact on biodiversity, ecosystem goods and services

Improve understanding of how the use of and trade in natural resources at European and international levels affects biodiversity (marine, inland waters and terrestrial), ecosystem goods and services and the resilience and resistance of ecological-economic systems, and develop or improve methods to measure and value biodiversity and ecosystem resilience and detect when ecosystems are approaching the limits of their natural functioning or productive capacity. Establish and improve mechanisms and methods to determine the sustainability of various intensities of use of components of biodiversity and of ecosystems. This topic complements the preceding one. It relates to competitiveness, which depends on the state of biodiversity and ecosystem. Results will be shared effectively with citizens and other societal actors in ways that facilitate general understanding and impact on social, economic and environmental planning and decision making. Participation of International Cooperation Partner Countries (ICPC) is encouraged.

Funding scheme: collaborative projects (small or medium-scale focused research projects)

***Expected impact**: Assessment of the impact of the use and abuse of natural resources on biodiversity, the ways in which systems (ecosystem services) may respond and how resource use could be made more ecologically sustainable. The results should allow governmental and non-governmental actors to discuss and develop viable policy options and should support their implementation. Results will have to be communicated effectively to citizens and other societal actors in Europe and in other parts of the world in ways that facilitate general understanding and impact on social, economic and environmental planning and decision making.*

ENV.2007.2.1.4.3. Biodiversity values, sustainable use and livelihoods

Increase knowledge of the cultural, social, spiritual, economic and other values of biodiversity. Improve understanding of public beliefs, perceptions, attitudes and preferences regarding biodiversity and the drivers of biodiversity change, and how they influence human behaviour and public policy. Improve and assess value-based strategies to promote sustainable livelihoods and lifestyles, and to reduce the vulnerability of livelihoods, while conserving and husbanding biodiversity and securing income to rural marginal areas. Improve understanding of and capacity to deal with conflict over the multifunctional uses and preservation of ecosystems and components of biological diversity, and contribute to the development of policy instruments and tools for conflict reconciliation. Understanding the link between loss of biological and cultural diversity at global and local levels. **(Specific International co-operation action)**

Funding scheme: collaborative projects (small or medium-scale focused research projects)

***Expected impact**: Constructive engagement with a broad selection of social groups and their governmental and non-governmental representatives in order to enable serious consideration and uptake of information generated from this work to improve their capacity to design policies that take into account the true social (economic and non-economic) value of biodiversity.*

Area 6.2.1.5. Urban development

ENV.2007.2.1.5.1. Urban metabolism and resource optimisation in the urban fabric

Devising innovative strategies for decoupling the impact from resource use from economic development and optimising the urban planning and design in order to accommodate increasing demand for space and resources while reducing material and energy consumption. In an industrial ecology perspective, all relevant physical flows through European urban systems will be identified and the associated environmental impacts will be evaluated. The analysis will address the different scales (from regional to site level) and the effect of individual actors' perspectives and behaviour and more generally the economic, institutional and regulatory factors should also be assessed. Economic and institutional instruments to influence individual behaviour and relevant material flows will be evaluated with respect to the physical, environmental and socio-economic impacts.

Funding scheme: collaborative projects (small or medium-scale focused research projects)

***Expected impact**: Contribution to the development of new strategies and tools for a more sustainable use of energy and materials in urban planning. These achievements should be considered by urban planners, infrastructure developers and social networks. This should lead to reducing wastes and saving raw materials, without impacting negatively on economic development and social welfare. Support to the implementation of the Thematic Strategies on the urban environment, sustainable use of resources and the prevention and recycling of waste and the related Directives is also expected.*

Area 6.2.1.6. Integrated forest research

(Not open in 2007)

Sub-activity 6.2.2. Management of marine environments

Indicative available budget: 21 M€

Area 6.2.2.1. Marine resources

Consortia in this sub-area are especially encouraged to include partners and field sites in the ultra-peripheral regions of Europe and International Co-operation Partner Countries.

ENV.2007.2.2.1.1. Development of advanced ecosystem models and methodologies for the management and the sustainable use of resources

Develop methodologies based on existing data and knowledge about ecosystem functioning, processes and patterns, aiming at conservation, sustainable management and exploitation of marine resources and their environment (ecosystem management approach). Data from different sources should be integrated, including oceanographic, geophysical, geological, sedimentary, hydrological, ecological, biological, microbiological, social and economic data. Synthesizing methodologies comprise dynamic models, indicator frameworks, inter-operable data management systems and public information systems. The project should also include synthesis of knowledge about social and economic impacts of different management strategies. The methodologies should serve as tools to support conservation, management and sustainable use of resources, including fish and their environment (ecosystem management approach). The knowledge synthesis should therefore include development of communication modalities which could operationalise knowledge on marine ecosystems in the public debate and in policy decision making. Participation of International Co-operation Partner Countries is encouraged.

Funding scheme: collaborative projects (large-scale integrating projects)

***Expected impact**: An improved knowledge base for the conservation and sustainable use of marine ecosystems and their resources. Engagement with key governmental and*

non-governmental actors which lead to the development of innovative approaches and modern participatory management tools for the restoring and sustainable use of marine ecosystems and their consideration for practical implementation. This work should contribute to EU orientations in the field of marine Protection Strategy, the proposed Marine Policy, the Common Fisheries Policy and the international agenda for the rebuilding of degraded marine ecosystems by 2015 (Johannesburg Plan of Implementation) and more generally the protection of the Sea and the sustainable use of the Oceans.

ENV.2007.2.2.1.2. Ecology of important marine species

Increase knowledge on the ecology and role (including life cycle) of commercially important marine species and/or groups of species with significant ecological functions (keystone species). Special attention should be given to the life cycle and the migration patterns which for some key species remain virtually unknown. The work should be done having in mind the need for developing conservation measures and restoration options of key species in their ecosystem context.

Funding scheme: collaborative projects (small or medium-scale focused research projects)

***Expected impact**: Public access in easily understandable formats to the knowledge base of scientists, fisheries manager, fishermen and civil society organisations involved in conservation efforts that are necessary to develop operational and innovative tools for the protection and/or a more sustainable use of the marine species. This research should contribute to the effective implementation of the EU Common Fisheries Policy and to the EU Environmental Policy.*

ENV.2007.2.2.1.3. Habitat-marine species interactions in view of ecosystem based management in the deep-sea

The link between marine species, including fish and deep-sea habitats is still poorly known. A better understanding of this relationship is essential for the evaluation of the impact of marine protected areas on fisheries, within the broader framework of a regional ecosystem-based management approach. Research will focus in the first instance on: i) the identification and modelling of the ecosystem function of cold water coral reef habitats and description of the ecological interaction between reefs and fish species of commercial interest; ii) the assessment of quantitative and qualitative fisheries effects upon these habitats, and impact upon associated fish species and productivity. Participation of International Co-operation Partner Countries is encouraged.

Funding scheme: collaborative projects (large-scale integrating projects)

***Expected impact**: Publicly accessible results in easily understandable presentations. Beyond the better understanding of deep-water ecosystems, this activity should expand the knowledge base for the implementation of an ecosystem approach to deep-sea fisheries management, as well as developing options by governmental and non-governmental actors for protection, governance and management of deep-sea resource, including fisheries.*

ENV.2007.2.2.1.4. Dynamic of marine ecosystem in a changing environment

Investigate how marine ecosystems respond to and evolve with a changing environment. The scenarios to be considered should address in an integrated manner the main driving factors, essentially changes in climate patterns, ocean circulation, pollution, invasive alien species and ocean acidification (a particularly important process), as well as the impact of fisheries. The project will investigate the response of marine ecosystems to the combined effects of the many changing parameters and anthropogenic action e.g. acidification, eutrophication, temperature, light and nutrients, overfishing, invasive alien species. The focus should be on the consequences for marine organisms and population dynamics, the likely impacts on resource management, products and services.

Funding scheme: collaborative projects (large-scale integrating projects)

> ***Expected impact****: The research should improve the knowledge base on marine ecosystems and the way they are impacted by the many driving forces, either anthropogenic or natural. This should provide input to governmental and non-governmental actors in the development of innovative tools and strategies for the rebuilding degraded marine ecosystems, protection and the sustainable use of the sea and its resources, in the perspective of the ecosystem approach. It should also improve the knowledge base for protection and management scenarios aimed at reconciling the interests of the many economic groups benefiting from the marine resource (including coastal). The topic is in support to EU Marine Strategy and should consider the long-term ecological objectives. It is also relevant to the EU Maritime Policy and the EU Common Fisheries Policy.*

ENV.2007.2.2.1.5. Deep Ocean geophysical and biological processes

The work to be undertaken within the perspective of a "Deep-Sea Frontier" initiative should lead to providing fundamental knowledge in many domains ranging from history, monitoring and prediction of geohazards to sustainable exploration and options for the conservation and sustainable use of deep sea resources. The project will aim to develop the actions required to implement a fully functional European Deep-Sea Frontier Initiative based upon an agreed road map. The truly European Deep-Sea Frontier project could be launched at mid FP7 (at the earliest).

Funding scheme: coordination and support actions (coordinating type)

> ***Expected impact****: An agreed road map capable of leading to the implementation of a fully functional European Deep-Sea Frontier Initiative. The networking of the various research communities – ocean drilling, ocean margins, underwater observatories, climate change - thereby enabling them to build and demonstrate the foundations required for integrated pan-European research to be undertaken into the complex and interlinked physical, geological, chemical, ecological, biological and microbial processes that take place in the deep sea.*

ENV.2007.2.2.1.6. Investigating Life in Extreme Environments

Furthering the knowledge of life in extreme environments (including polar and extreme terrestrial environments). The information exchange and networking of the community involved with scientific activities in extreme environments should be improved in order to facilitate interactions between scientists, technologists as well as programmes and projects. Large scale multidisciplinary events (conferences, workshops, forums) should be organised regularly in order to build and maintain a dynamic European research community in the domain of investigating life in extreme environments.

Funding scheme: coordination and support actions (coordinating type)

> ***Expected impact****: Building and strengthening the interdisciplinary network of EU scientific institutions addressing Life in Extreme Environment, thereby facilitating interactions between them (and between the EU and the rest of the world). The development of a strategic research agenda and the required options to implement it. These actions should build the ERA in this emerging area of research. This work could also provide input to the development of the ERC priorities.*

ENV.2007.2.2.1.7. Promoting access to information across marine themes

Widely disseminate and provide easy access to all FP information of potential interest to the marine stakeholder community (public and private), in particular from FP6 and FP7. 1) promote communication between all marine actors involved in on-going FP projects and compile information on FP projects as required by the decision-makers; 2) give added value to the marine FP projects by the dissemination of information on their results; 3) enhance public outreach and education activities in the marine research domain.

Funding scheme: coordination and support actions (supporting type)

> ***Expected impact****: This project should contribute to one of the primary recommendations of the recent Commission Green Paper "Towards a future Maritime Policy for the Union: A European vision for the oceans and seas" i.e.: "the EU could consider setting up a European Marine Observation and Data Network which would provide a sustainable focus for improving systematic observation (in situ and from space), interoperability and increasing access to data". This action will contribute to this objective by putting dispersed information sources, with emphasis on research results, from various actors into a publicly accessible and analysable format, connect these actors with the public and private domain, including the educational sectors and reduce transaction costs for doing innovative research by building more effectively on existing (but often inaccessible) information.*

ENV.2007.2.2.1.8. Fostering improved co-operation between marine science and the private sector

It is clear that co-operation between marine scientists, the oil & gas industry and the telecommunication sector is growing. Such developments open up a new perspective for cooperation between the commercial sector and environmental R&D. The marine science

community and the private sector should be encouraged to find areas of synergy where common initiatives can be developed, e.g. oceanography, underwater observatories, gas hydrates, data management and information services, etc.

Funding scheme: coordination and support actions (supporting type)

***Expected impact**: Improved knowledge transfer (dissemination and exploitation) in order to implement innovative approaches aimed at protecting, restoring and/or using marine systems and resource in a more sustainable way. Direct involvement of the main stakeholders in the public and private sectors. An effective interface to the public and private sectors to enable widespread understanding and acceptance of marine science and private sector activities.*

ENV.2007.2.2.1.9. Access to and recovery of marine data from previous FP projects

To investigate whether data from previously funded EC projects has been properly archived and maintained and whether this data is freely available. To identify the reasons why datasets may not have been maintained and whether any barriers to data access exist. Wherever possible, this project should recover and make available data that has not been made accessible or is no longer accessible.

Funding scheme: coordination and support actions (supporting type)

***Expected impact**: The proposal for this activity is motivated by the recent Commission Green Paper "Towards a future Maritime Policy for the Union: A European vision for the oceans and seas". One of the primary recommendations of this Green Paper is that "the EU could consider setting up a European Marine Observation and Data Network which would provide a sustainable focus for improving systematic observation (in situ and from space), interoperability and increasing access to data". This action will contribute to this objective by providing increased free and easy data access in a stable long-term institutional context.*

Activity 6.3. ENVIRONMENTAL TECHNOLOGIES

Environmental technologies for the Environment programme are those needed to reduce the environmental impact of human activities, to protect the environment, to manage resources more efficiently and to develop new products, processes and services more beneficial for the environment than existing alternatives. [18][19][20]. Priority will be given to innovative system solutions – aiming at closing the cycle of materials - which integrate front-end with in-process and end-of-pipe components within a coherent organisational (and institutional) framework, having the objective to decouple growth from resource depletion. Within the technological research activities, due consideration should be given to appropriate sustainability and Life Cycle assessments, eco-innovation and eco-efficiency indicators, market potential and exploitation barrier studies. The development of technology assessment methodologies should be seen as an integral and key component of the programme.

Throughout the whole FP7, research will target several issues ranging from technologies for managing resources, reducing risks, monitoring, preventing or treating pollution more efficiently, related to all environmental media (water, soil, air, sea, etc.) and wastes; to clean processes leading to the phasing out of dangerous substances; to technologies for the sustainable management of the human and built environment, as well as for the conservation and restoration of cultural heritage; to risk, performance assessment and testing of technologies, and the further development of related methods such as Life Cycle Assessment.

In the present call, priority is given to subjects that – in a roadmap approach which takes in consideration past and current activities – are either not sufficiently addressed by on-going European research – as it is the case for Solid Wastes -, or represent areas of rapid scientific and technological developments – like it is the case for separation technologies applied to industrial water streams -, or represent priorities linked to the implementation of new European environmental policies or regulations - as it is the case for the subjects proposed for Soil, Wastes, Chemicals testing and for Mercury. Priorities highlighted by the Strategic Research Agendas of relevant Technology Platforms (Water Supply and Sanitation, Sustainable Chemistry, Construction) were also considered.

[18] Theme 5, Energy, deals with energy efficiency, renewables, emissions and effluents from energy generation, CO2 capture and other technologies of environmental nature directly linked to the energy sector.

[19] Theme 7, Transport, deals with emissions from the transport sector and with other relevant group of transport and mobility technologies that can be classified of environmental nature

[20] For industrial environmental technologies and clean processes, emphasis is given to those applicable to a wide range of industrial sectors; research on clean processes is also carried out through Theme 4, NMP.

Sub-activity 6.3.1 Environmental technologies for observation, simulation, prevention, mitigation, adaptation, remediation and restoration of the natural and man-made environment

Indicative available budget: 38 M€

Area 6.3.1.1. Water

ENV.2007.3.1.1.1. Innovative technologies and services for sustainable water use in industries

This large-scale action should aim at the development and implementation of new, reliable and cost-effective 'clean' water technologies for helping European industries to reduce water use, mitigate environmental impacts, and better manage health and safety risks, while improving their product quality and process stability. Proposals should consider adaptive solutions, within an integrated water resources management approach, which include monitoring, information management systems and cross-sectoral technologies for reducing wastes and by-products (e.g. separation technologies). Issues of industrial cooling, scaling and (bio)fouling, and monitoring of critical compounds in process water streams should be given due consideration. Project consortia should consist of at least 50% of industrial partners representing various industries, inclusive of relevant SMEs, and at least 50% of the requested EC contribution should be in benefit of industrial partners. (**SME relevant topic**)

Funding scheme: collaborative projects (large-scale integrating projects) (Community contribution from 4 up to 10 million Euros)

> ***Expected impact:*** *Substantial reduction of fresh water needs in the considered industrial processes and of effluent discharge to the environment. More efficient use of limited water resources by integrating process technologies in different industrial branches for cascades of water usage, towards closed water cycles, adapted to the quality requirements of different industries. Improved process stability and product quality by improved and/or more constant water quality.*

ENV.2007.3.1.1.2. Technologies for measuring and monitoring networks

Technologies to assess the chemical and ecological status of water bodies for cost-effective monitoring campaigns need to be developed. Priority will be given to miniaturised sensing systems and wireless network technology for the deployment of essentially self-sustaining wireless sensor networks aimed at spatial and temporal water quality assessment. Emphasis should be put on the development of stable chemo- and bio-sensors with low maintenance requirements. Hardware components comprising smart (bio)materials and microchip technologies for sensing a wide range of parameters - including those required for the Water

Framework Directive reporting- are to be developed with supporting software applications. A relevant participation of industrial partners as well as of SMEs is requested. (**SME-relevant topic**)

Funding scheme: collaborative projects (small or medium-scale focused research projects)

> ***Expected impact:*** *Substantial reduction of labour-intensive field sampling and measuring campaigns as well as fewer errors during data collection and transcription of results. The temporally and spatially dense data provided by these technologies is expected to reveal previously unobservable phenomena. The action should lead to strengthening the European industrial competitiveness in this field.*

Area 6.3.1.2. Soil

ENV.2007.3.1.2.1. Development and improvement of technologies for data collection in (digital) soil mapping

Development, implementation and validation of new field, remote and proximal observation technologies capable to improve, accelerate and objectify the collection of soil data, allowing at the same time a non destructive approach. This action should provide improved technologies for measuring soil properties, including physical and hydrologic properties, capable to give information about several soil functions. Well known techniques, such as electromagnetic induction (EMI) or georadar, should be improved and validated, and other possible geophysical (such as magnetic or micro-seismic) and spectroscopic techniques should be explored. Data processing tools are needed for enhancement and correction of source data. The participation of industrial partners, and in particular of SMEs, is essential. The projects should support the implementation of the Soil Thematic Strategy. **(SME relevant and Policy relevant topic)**

Funding scheme: collaborative projects (small or medium-scale focused research projects)

> ***Expected impact:*** *Improvement of spatial analysis of soils and soil functions, in relation to indicators for degradation threats. A substantial improvement in technologies for acquiring soil data is expected in terms of spatial resolution, measurement precision, reliable correlation with main soil functions and operational/economical feasibility.*

ENV.2007.3.1.2.2. Development of technologies and tools for soil contamination assessment and site characterization, towards sustainable remediation

Technologies and tools for site characterisation and monitoring of contaminated soils should be improved including combinations of geophysical systems, chemical analysis, statistical analysis, biomarkers and/or modelling with particular attention to less-invasive (e.g. minimize drilling) and depth-oriented tools, to bio-availability of contaminants and to spatio/temporal

heterogeneity of soils. Tools for detection of local, primary or secondary sources should be developed in view of more source-oriented sustainable remediation technologies. This action should foresee the participation of industrial partners, and in particular of SMEs. The projects should support the implementation of the Soil Thematic Strategy. **(SME and Policy relevant topic)**

Funding scheme: collaborative projects (small or medium-scale focused research projects)

> ***Expected impact:*** *Improvement in effectiveness of remediation/mitigation technologies for contaminated sites through a more favourable cost/benefit ratio of site characterisation and monitoring, and a more precise and reliable site characterisation and monitoring design. The projects should support the implementation of the Soil Thematic Strategy.*

Area 6.3.1.3. Waste

ENV.2007.3.1.3.1. Development of integrated waste management technologies for maximising material and energy recovery/recycling of the organic (humid) fraction of municipal solid waste

Research activities on the integration between different processes for the treatment of biodegradable waste are needed, looking also at the potential consequences deriving from their large scale implementation on C balance and the release of greenhouse gases. The research shall cover processes treating source-separated biodegradable wastes as well as the organic (humid) fraction coming from a pre-treatment stage. The co-treatment of organic waste deriving from other sources may be also considered. It is requested the demonstration of at least five different integration schemes implemented in different European regions, accompanied by Life Cycle Assessment studies, Life Cycle Social analysis and externality/Life Cycle Costing analyses. LCA studies shall be ISO 14040 conform and data shall be provided according to data format and quality requirements set up by the European Platform for LCA. Other tools for process evaluation (e.g. entropy and exergy analysis, material and energy flow analysis, cost-effectiveness analysis, etc.) could be applied. Consortia should be constituted by a balanced mix of research institutions, industrial partners (with a relevant share of SMEs), municipalities and other end-users. (**SME relevant and Policy relevant topic)**

Funding scheme: collaborative projects (large-scale integrating projects) (Community contribution from 4 up to 10 million Euros)

> ***Expected impact:*** *The results should provide solid "field data" to evaluate how the diversion targets foreseen in the Landfill Directive 99/31/EC can be reached in different regions of Europe. Improved knowledge on the environmental, economic, and social implications of source separation on the recovery/recycling of biodegradable waste. Increase of materials and energy recovery and GHG reduction by integration of different technologies.*

ENV.2007.3.1.3.2. New technologies for waste sorting

New/improved technologies for the sorting process of environmentally and economically important waste material flows (e.g. plastic polymers, WEEEs, Automotive shredder residues, etc.) need the implementation of new/improved automatic identification units, including sensors and measuring technologies for the quality assessment of sorted or unsorted fractions related to utilisation. A Life Cycle Assessment study (ISO 14040 conform), Life Cycle Social analysis and externality/Life Cycle Costing analyses shall be carried out. LCA data shall be provided according to data format and quality requirements set up by the European Platform for LCA. This action should foresee the participation of at least 50% (in terms of number of partners and budget) of industrial partners, with a relevant presence of SMEs. (**SME relevant topic**)

Funding scheme: collaborative projects (small or medium-scale focused research projects)

> ***Expected impact:*** *This action should contribute to improve the quality and homogeneity of the materials that have to be recovered, recycled or treated, being these key aspects in determining the final output of any waste-related process and the related environmental impacts. In case of thermal treatments for energy production, this should lead to a reduction of deposits and corrosion problems and an increase in energy efficiency. The evaluation of the impact of the proposed projects will be based on the quantitative and qualitative amelioration of the selected fluxes with respect to today's state-of-the-art technologies. The action should lead to strengthening the European industrial competitiveness in this field.*

ENV.2007.3.1.3.3. Networking and preparatory action in view of developing cost-effective, environmentally-safe waste treatment technologies and services adapted to the needs of developing countries, within a targeted life cycle approach

The need of appropriate and cost-effective technologies for developing countries, will be addressed through an action for networking among research centres, industries and end-users. The existing Environmental Impact Assessment methods and impact categories will be reviewed and assessed considering the peculiar geographical context. The feasibility of developing new specific impact categories and Life Cycle Impact Assessment methods will also be considered. The social and health related consequences of implementing new technologies for waste sorting and treatment in these regions should be properly considered and evaluated. This action should be focussed on Asian countries, where the fast-growing municipal waste generation is accompanied by an even more dramatic growth of industrial wastes (also considering those produced elsewhere but treated in this geographical area). **(SME relevant topic - Specific International co-operation action)**

Funding scheme: coordination and support actions (coordinating type)

> ***Expected impact:*** *Significant contribution to strengthening of formal and informal networks existing in Asia on waste treatment. Substantial integration in these networks of new actors like local waste processors and regulators. Better understanding of the*

specific surrounding conditions (environmental, economic, and social) and potential consequences of the existing and proposed waste treatment technologies.

Area 6.3.1.4. Clean Technologies

ENV.2007.3.1.4.1. Networking and preparatory action in view of control of mercury in industrial processes and products

The Mercury strategy foresees a progressive ban of Mercury, already included among the Priority Hazardous Pollutants of the Water Framework Directive. There are a number of areas of concern about this pollutant to be explored, including safe disposal of existing and future mercury stocks, control of mercury emissions (e.g. coal-combustion and small scale gold mining), substitution of mercury in products and processes, etc.
This coordination action should help structuring the scientific and industrial communities and preparing the ground for future and more focused research projects by identifying the most appropriate and effective research needs in this field in the short to medium term. The participation of industrial partners, and SMEs, is essential. (**SME relevant and Policy relevant topic)**

Funding scheme: coordination and support actions (coordinating type)

Expected impact: *The results of this research activity should provide scientific support to achieve the objectives of the mercury strategy, The identification of focused research needs in mercury will help to plan and prioritise research activities and resources in the short term, contributing to the phasing-out of this priority hazardous pollutant.*

Area 6.3.1.5. Built environment

ENV.2007.3.1.5.1. Low resource consumption buildings and infrastructure[21]

This coordination activity aims at promoting and facilitating the uptake of new or improved technologies for the built environment which reduce the life-cycle environmental impact associated to the use of multiple, natural and non-renewable resources (water, primary raw materials, energy, land) and the generation of waste. The reduction of use of hazardous substances in the building sector is also to be considered. Analysis of case-studies across Europe, pre-normative research, standards, training needs, directives and regulatory framework, and policy recommendations should be considered together with non-technical barriers to the uptake of environmental technologies Economic and institutional instruments to influence the choice of building and infrastructure technologies should be evaluated with respect to

[21] This action will be executed in coordination with and complementary to the 'Nanoscences, Nanotechnologies, Materials and new production Technologies' – NMP Theme in relation to technologies for the built environment and cultural heritage.

their potential physical and socio-economic impacts. This coordination action should serve as basis for establishing some consensus regarding further industrial research. (**SME relevant and Policy relevant topic)**

Funding scheme: coordination and support actions (coordinating type)

Expected impact: *Promotion and uptake of sustainable environmental technologies for a resource efficient built environment. This coordination action should provide support for policy in line with the Directives on energy, pollution prevention, landfill, waste, etc*

ENV.2007.3.1.5.2. Performance indicators for health, comfort and safety of the indoor built environment[22]

This coordination activity will help to enable the application of new design and technologies that improve the impact of the indoor built environment on health, comfort, feeling of safety and positive stimulation (including those for people with impaired cognitive, sensorial or motor capacity). For this, it will be necessary to review current standards across Europe. This will require firstly drawing up of an inventory of current performance indicators used in design and construction of the built environment and identifying areas where new indicators for health and safety (including accessibility and indoor environmental quality) should be developed. Finally, recommendations for design and technologies can be formulated. This coordination action should provide support for policy in the line with Directives on Construction Products (CPD) and on Energy Building Performance together with the European Environment & Health Action Plan. (**SME relevant and Policy relevant topic)**
Funding scheme: coordination and support actions (coordinating type)

Expected impact: *Optimal, healthy and comfortable indoor environment integrated within a sustainable, low-energy built-environment.*

Area 6.3.1.6. Marine environment

(not open in 2007)

[22] This action will be executed in coordination with and complementary to the sub-activity 'Environment and Health' of the Environment (including Climate Change) Theme, as well to the 'Nanosciences, Nanotechnologies, Materials and new Production Technologies' – NMP Theme in relation to technologies for the built environment and cultural heritage.

Sub-activity 6.3.2. Protection, conservation and enhancement of cultural heritage, including human habitat

Indicative available budget: 7 M€

Area 6.3.2.1. Assessment and conservation in cultural heritage

ENV.2007.3.2.1.1. Damage assessment, diagnosis and monitoring for the preventive conservation and maintenance of the cultural heritage[23]

This action should deliver new or improved non destructive technologies for the damage assessment, diagnosis and monitoring of the cultural heritage. Each project should primarily focus on complex assemblies and not on individual materials. Where particular emphasis is given in a project to movable cultural heritage then due account should be given to its environment and the immovable heritage context in which it is to be found. Likewise, for a project focusing on the immovable heritage, due consideration should be given to its environment and the movable heritage that it may host. Cooperation among scientists, conservators, restorers, industry and SMEs should lead to guidelines for preventive conservation. The participation of Mediterranean Partner Countries, in particular, is encouraged. (**SME relevant topic**)

Funding scheme: collaborative projects (small or medium-scale focused research projects)

Expected impact: *More cost-effective preventive conservation and maintenance, applicable to a wide variety of cultural assets and to different environmental conditions. The developed methodologies should be broadly accepted and used beyond the EU.*

Area 6.3.2.2. Networking, knowledge transfer and optimisation of results in cultural heritage

ENV.2007.3.2.2.1. ERA-NET[24] for the preservation of the tangible cultural heritage

This ERA-NET should aim to implementing the networking of research programmes in this field and provide an added value to existing National research programmes on cultural

[23] This action will be executed in coordination with and complementary to the 'Nanosciences, Nanotechnologies, Materials and new production Technologies' – NMP Theme in relation to technologies for the built environment and cultural heritage.

[24] This topic is subject to a joint call for ERA-NETs across the themes – See Annex 4 4

heritage through coordination. The action should give added value to the national activities implemented in this domain and set up an appropriate framework to coordinate them, complementing the European coordination already on-going for national activities in the field of intangible and digital heritage. This action should as well help to promote favourable educational, training and knowledge transfer, and facilitate the inclusion of cultural heritage protection in the EU legislation.

Funding scheme: coordination and support actions (coordinating type) (Community contribution up to 2 million Euros)

> ***Expected impact:*** *The proposals should demonstrate how the coordination activities will prevent the duplication of efforts while improving complementarities and synergies, in application of article 151 of the EC Treaty, also for the harmonisation and acceptability of technologies and methodologies applicable to cultural heritage.*

ENV.2007.3.2.2.2. Consolidation and dissemination of results related to cultural heritage

This action, mainly organised as a large European Conference in principle in 2008, should promote the exploitation and spin off of EU research results, through demonstration of new technologies tools and devices developed by the SMEs and industry in close cooperation with scientists and for benefit of end-users, conservators and restorers, managers and owners of the cultural patrimony. The proposer must be supported by the National Authorities of the EU country where the Conference will be held. The participation of Third Countries organisations is welcome.

Funding scheme: coordination and support actions (supporting type)

> ***Expected impact:*** *Proposals should be able to demonstrate in a credible way how they will maximise the outreach of the variety of actions that they will propose, how they will be able to obtain the widest audience to the Conference through registered participants and through the media, and how they will be able to obtain a wide and balanced participation from all European countries and beyond.*

Area 6.3.2.3 Environment technologies for archaeology and landscapes

Not open in 2007.

Area 6.3.2.4 Fostering the integration of cultural heritage in urban and rural settings

Not open in 2007.

Sub-activity 6.3.3. Technology assessment, verification and testing

Indicative available budget: 5 M€

Area 6.3.3.1 Risk assessment of chemicals and alternative strategies for testing

ENV.2007.3.3.1.1 In-silico techniques for hazard-, safety-, and environmental risk-assessment[25]

The objective is to improve in-silico techniques, including Quantitative Structure Activity Relationships (QSAR) models for environmental risk assessment focusing on the eco-toxicological endpoints which are of highest relevance for the Replacement and Reduction of animal use in chemicals safety testing. On the one hand in-silico techniques should be developed and validated as screening tools; on the other hand they should address well defined toxicological end points of relevance for "Intelligent Testing Strategies". **(SME relevant and Policy relevant topic)**

Funding scheme: collaborative projects (small or medium-scale focused research projects)

> ***Expected Impact****: Contribution to the implementation of the REACH regulation through a significant reduction of animal tests in the testing of chemicals.*

ENV.2007.3.3.1.2 Defining a long-term research strategy for the full replacement of animal tests for repeat dose systemic toxicity[26]

In the long run a significant effort should be made to fully replace animals in the testing of chemicals, with focus on the development of alternative methods for the assessment of repeat dose systemic toxicity without compromising safety aspects. This extremely challenging long-term goal needs to be carefully planned through a number of high-level workshops and experts meetings in order to develop the corresponding long-term research programme. This should be achieved through a coordination activity, networking European and national activities on the subject. (**SME relevant topic)**

Funding scheme: coordination and support actions (coordinating type)

> ***Expected Impact****: This co-ordination action is expected to result in a focused European RTD programme with the long-term goal to phase out animal tests.*

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[25] This action will be executed in co-ordination with and complementary to the 'Health' Theme within a common programme on Replacement, Reduction and Refinement of Animal Testing.

[26] This action will be executed in co-ordination with and complementary to the 'Health' Theme within a common programme on Replacement, Reduction and Refinement of Animal Testing.

Area 6.3.3.2. Technology Assessment

Not open in 2007.

Area 6.3.3.3. Environmental Technologies Verification and Testing

Not open in 2007.

Activity 6.4. EARTH OBSERVATION AND ASSESSMENT TOOLS FOR SUSTAINABLE DEVELOPMENT

Research activities will be focussed on the development and integration of the Global Earth Observation System of Systems (GEOSS) within which GMES (Global Monitoring for Environment and Security) is complementary for environment and sustainable development in the context of the GEO (Group on the Earth Observation) initiative (including support to the GEO secretariat). Interoperability between observation systems, information management and data sharing, and optimisation of information for understanding, modelling and predicting environment phenomena will be addressed. In relation to the nine societal benefit areas of GEO: natural and human-induced hazards, environment and health, environmental related energy issues, climate change, water management, weather, ecosystem management, sustainable agriculture and desertification and biodiversity. A strong emphasis is put on the need to integrate the European Earth Observation related research activities into the global picture.
The sub-activity on "assessment tools for sustainable development" will focus on improving tools for impact assessment along three lines: (i) the identification of policy impacts at a disaggregated level; (ii) the implications of EU budget scenarios on sustainable development; and (iii) the analysis of the contribution of the co-operation and trade policies to sustainable development. In terms of indicators, it will bridge mainstream indicators with sustainable development objectives. The development of links between the economy, environment and society also will be targeted in order to promote sustainable consumption patterns. Furthermore, civil society organisations are invited to build partnerships with research organisations in order to enrich the research agenda and to suggest innovative ways to explore the links between economy, environment and society.

Sub-activity 6.4.1. Earth and ocean observation systems and monitoring methods for the environment and sustainable development

Indicative available budget: 21 M€

Area 6.4.1.1. Integration of European activities within GEO

ENV.2007.4.1.1.1. Monitoring of the carbon cycle at global level

To contribute to an effective monitoring of the carbon cycle at global level as recommended by GCOS in supporting the European participation to an international CO_2 research monitoring project. The research will contribute to building an integrated global approach that combine both remote and in-situ observations and to promote close collaboration with the

international carbon cycle research community; The project should rely on existing European activities in the domain of CO_2 monitoring and bring them onto the global level through collaboration activities with similar projects in other continent/countries. As such the project should support the European activities needed to ensure a proper collaboration at global level and involve international partnership.

Funding scheme: coordination and support actions (coordinating type)

> ***Expected impact****: Significant progress towards a global carbon observation system by linking the European Earth Observation research initiatives relevant to carbon cycle assessment with similar existing initiatives in other continents/countries as a contribution to GEO.*

ENV.2007.4.1.1.2. Contribution to a global biodiversity observation system

Facilitate the European contribution to the development of a global biodiversity observation system that is spatially and topically prioritized, based on analysis of existing information, identifying unique or highly diverse ecosystems and those supporting migratory, endemic or globally threatened species, those whose biodiversity is of socio-economic importance, and which can support the strategy adopted for monitoring biodiversity trends in the UN Convention on Biological Diversity. The project should facilitate the development of the multi-institutional biodiversity observation network in collaboration with Global Biodiversity Information Facility and ensure that it links to data sets of ecological and other related observation systems in particular the LTER and LTSER networks. International Co-operation is encouraged.

Funding scheme: collaborative projects (small or medium-scale focused research projects)

> ***Expected impact****: Significant progress towards a Global Biodiversity Observation System through collaboration between the European Earth Observation research initiatives relevant to ecosystems and species of merit with complementary initiatives in other continents/in as a contribution to GEO.*

Area 6.4.1.2. Cross-cutting research activities relevant to GEO

ENV.2007.4.1.2.1. Coordination of national earth observation programmes in view of their long-term integration and sustainability

The aim is to foster collaboration between national research programmes in the domain of Earth Observation across several of the nine GEO societal benefit areas, in bringing together both in-situ and space observing systems. The action should develop and strengthen the coordination and collaboration between national and regional terrestrial, atmospheric, and oceanic observation programs collecting more specifically in-situ data. It should demonstrate a significant added value for the GEO societal benefit areas by increasing synergies between the terrestrial, atmospheric and oceanic observation programs and pave the way towards the long-term convergence, integration and sustainability of the observation programmes.

Funding scheme: coordination and support actions (coordinating type)

Expected impact*: Prepare the ground for an integrated sustained European earth observing system with improved interoperability between existing observation systems, optimised information management and data sharing for understanding, modelling and predicting environment phenomena; availability of adequate data sets such as long time series, real-time data, including considering the geographic coverage needed in formats that facilitate access in the public domain for a wide range of users so that citizens, regulators, educators, companies etc. can use research results for a wide range of potential applications.* The action should in particular explore the feasibility of an ERA-*NET for a later call.*

ENV.2007.4.1.2.2. Contributing to the development of a worldwide network of in-situ observatories for seismogenic hazards

To develop the European capacity in view of investigating earthquake mechanisms at depth close to the seismic source relying on previous European research activities on seismically active sites. The project should take into account the current development of the Network of Research Infrastructures for European Seismology (NERIES). Such a project should contribute to deliver the basic knowledge, including with respect to the role of fluids, through a cross-cutting approach for earthquake, and landslides, tsunamis and volcanic related events. Such a project should contribute to proceed with long term experimentation in connection with the establishment of a European in-situ seismic observatory located on a major active fault zone. In the GEO context the project should take into consideration other key subsurface seismic observatories situated on active sites around the world and organise the research activities together with those existing experiments outside Europe, and ensure the communication of data as well as their access and interoperability by the wider science community. International co-operation is encouraged.

Funding scheme: collaborative projects (small or medium-scale focused research projects)

Expected impact*: Specification derived from basic knowledge on active seismic zone for the development of monitoring systems in seismogenic zones as required within GEO for multihazard seismogenic risks, interoperability between seismic monitoring systems, information management and data and optimisation of information for understanding, and modelling seismogenic zone.*

ENV.2007.4.1.2.3. Dissemination and broadcasting of scientific observation data and information

The project should enable identifying FP6/ FP7 initiatives willing to broadcast and disseminate research data. The goal of the action would be to operate through the project the dissemination and the broadcasting of the environmental data produced by various FP projects and to explore and develop a scheme through which the broadcasting and dissemination becomes sustainable. The project should rely on and network existing initiatives in the different sectors of environment dealing with data exchange and dissemination. The project

should develop an approach which should be compatible with the one developed within GEO (Group on Earth Observation), focussing on relevant GEO Societal Benefit Areas.

Funding scheme: coordination and support actions (supporting type)

> ***Expected impact****: Better availability and access to earth observation data and products made available through FP6/FP7 research projects.*

Area 6.4.1.3. Earth Observation activities in emerging areas

ENV.2007.4.1.3.1. Application of Earth Observations to environmental and health issues

To promote and explore in Europe the application of Earth observations, in particular the integration space-based observations with in-situ data, to improve human health as an emerging field in which GEO can facilitate significant progress by forging new connections between the Earth observation and health sectors at all levels. Activities should focus on: 1. Identifying and further refining human health user requirements for Earth observations; 2. Improving the Earth observation sector's understanding of these requirement; 3. Demonstrating the utility of Earth observations for human health needs; 4. Raising awareness of the availability and potential uses of Earth observations for human health.

Funding scheme: coordination and support actions (supporting type)

> ***Expected impact****: Potential impact depends on the awareness, understanding and active participation of information users in governmental and non-governmental organisations in the definition and use of information in formats compatible with their operational modes. User needs will determine the development of European Earth Observation systems and related activities in the area of environmental and health needed for GEOSS where observing/monitoring systems are lacking or need to be significantly completed.*

ENV.2007.4.1.3.2. Monitoring the ocean interior, seafloor, and subseafloor

To contribute to develop and bring into the global context the European contribution to observing and monitoring systems for the Ocean Water Column, Ocean Seafloor and Subseafloor. The project should rely on existing European initiatives such as MerSea, Eur-Oceans, ESONET, HERMES and international ones like ARGO in order to contribute to developing the global ocean observatory system together with other existing initiatives (for instance the Neptune one). The project should support and complement existing collaboration activities in order to add missing scientific components and partners, develop or improvecommon data exchange protocol, exchange of technical know-how and user requirement specification, respectively this aims to ensure an optimal use of the available resources and to optimise existing project strategies. This initiative should build upon existing science, engineering and financial plans to develop such a global system, working together with relevant participants from the private sector.

Funding scheme: collaborative projects (small or medium-scale focused research projects)

***Expected impact**: Development of the European component of the Global Ocean interior Observation system and related activities needed for GEOSS where observing/monitoring systems are lacking or need to be significantly completed.*

ENV.2007.4.1.3.3. Development of a Global Soil Observing System

Conduct research activities needed for the European contribution to the completion of the World Soil and terrain database (SoTer) in view of developing the emerging global soil observatory. The project should build on already existing European contribution towards the above objectives in particular in view of filling the gaps occurring from different countries (e.g. developing countries). It should also include elaborating methods to analyse, quantify and record soil status with respect to the multiple pressures affecting soil ecosystems. The project should contribute integrating the European efforts in providing a regional pilot platform which would be linked to the World Soil and terrain database and other GEO relevant initiatives in involving the adequate international partnership, and in compliance with the objectives of the EU Soil Thematic Strategy.

Funding scheme: collaborative projects (small or medium-scale focused research projects)

***Expected impact**: Development of European Earth Observation systems and related activities as a major component of a future Global Soil Observing System for GEOSS where observing/monitoring systems are lacking or need to be significantly completed.*

Area 6.4.1.4. Developing capacity building activities in the domain of earth observation in developing countries

ENV.2007.4.1.4.1. Georesource information system for Africa

To set-up the preparatory phase for the building of an information system containing and making available African Geological resources including groundwater, energy, raw material and mineral resources (georesources) that are/have been collected through numerous initiatives by both African countries, regional, international and European Organisations collectively, and are a unique archive of Africa related geoscientific observation data which primarily need to be shared with African partners. The preparatory phase of this initiative should comply with the objectives of GEOSS and the EU development policy for the use of the Georesource data which are primarily to be shared with the African countries. The project should include participants from the African countries with experience in management of georesources, and exploring potential future application for the other ACP countries. **(Specific International co-operation action)**

Funding scheme: coordination and support actions (supporting type)

***Expected impact**: Safeguarding/protecting observation data for Georesources in Africa as well as helping exploiting the relevant observing systems.*

ENV.2007.4.1.4.2. Improving observing systems for water resource management

Bring together research activities supporting the production of a number of new products for improving the water resource management in countries suffering from drought and floods (e.g. ACP countries) in the domain of precipitation, soil moisture, evaporation, evapotranspiration and other water cycle variables, by in-situ observations and the planned space mission contributing to the GEO initiative. Specific attention should be given through the project to clouds and precipitation that are at the heart of Earth's water cycle and to elaborating scenarios for observations at both the local and global scale which would enable better precipitation forecasts. The project should involve participants from the developing countries with experience in extreme precipitation events. **(Specific International co-operation action)**

Funding scheme: collaborative projects (small or medium-scale focused research projects)

> ***Expected impact****: Improved integrated monitoring systems for water resource management in developing countries, considered for deployment in the countries concerned and used at least at pilot scale.*

ENV.2007.4.1.4.3. GEONETCast applications for developing countries

To test, with the collaboration of developing countries, the GEONETCast concept currently developed through GEO by which environmental satellite and in situ data and products from participating data providers within GEO would be transmitted to all users through a global network of communications satellites, using a multicast access controlled broadband capability. The project should address a limited number of pilot cases through which environmental data transmission and exchange covering some or all of the 9 societal benefit areas of GEO could be operated by using the GEONETCast protocol and involving European projects participants and International Co-operation Partner Countries (ICPC)**. (Specific International co-operation action)**

Funding scheme: coordination and support actions (supporting type)

> ***Expected impact****: Relevant organisations in the developing countries start using broadcast environment data received through GEONETCast pilot cases and benefit from development of the people capacity in those countries to use GEONETCast in local/national planning and decision making.*

Sub-activity 6.4.2. Forecasting methods and assessment tools for sustainable development taking into account differing scales of observation[27]

Indicative available budget: 11 M€

Area 6.4.2.1. Tools for impact assessment

ENV.2007.4.2.1.1. Methodologies for scaling down to the regional and local level the analysis of policy impacts on multifunctional land uses and the economic activity

Innovative methodologies utilising modelling techniques (i.e. microsimulation, multi-agent, simplified cellular automata) are requested to scale down the analysis of policy impacts on multifunctional land uses as well as on the economic activity, from the EU or national level to the regional (and eventually local) scale, with special emphasis on new Member States as well as on Accession and Candidate Countries. The project will consider eco-system and biodiversity functionalities in the analysis at disaggregated level. Methods will also include participatory approach and will take into account stakeholder perspectives. The improved methodologies will seek to enhance the scope of strategic environmental assessment (SEA), sustainability impact assessment (SIA) and environmental impact assessments (EIA).

Funding scheme: collaborative projects (small or medium-scale focused research projects)

> ***Expected impact****: Enhanced analysis of possible policy impacts (in particular related to rural development and to Cohesion Policy and Pre-Accession Aid) on sustainable development by the different Commission services.*

ENV.2007.4.2.1.2. Improved tools to analyse the sustainable development implications of the EU financial perspective revision (2008-2009)

Existing models (macro economic, econometric, general and partial equilibrium) will be improved to allow the simulation of budget scenarios (level, burden sharing and allocation) and measure their impacts on the environment, social and economic dimensions as well as identify the possible externalities. Strong attention should be paid to the consideration within the models of the main European policies: agriculture, fisheries, research and innovation, Cohesion Policy and Pre-Accession Aid. (**Policy relevant topic**)

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[27] As mentioned in the section on funding schemes (page 7-8) under this sub-activity 6.4.2, Community contribution for the collaborative projects (small or medium-scale focused projects) is up to 2 million Euros.

Funding scheme: collaborative projects (small or medium-scale focused research projects)

***Expected impact**: Facilitated revision of the financial perspectives by the different Commission services.*

ENV.2007.4.2.1.3. Tools for impact assessment of sustainable development policies in international collaboration partner countries

The purpose is to further develop tools for analysing key elements of sustainable development policies at the macro- and meso-economic levels, with particular attention to the effects of co-operation and trade policies as well as to the impacts of the delocalisation of EU activities. The participation of ICPC partners should be predominant in the project. **(Specific International co-operation action)**

Funding scheme: collaborative projects (small or medium-scale focused research projects)

***Expected impact**: Improved EU international development and research agendas through a better understanding of consequences of sustainable development policies in ICPC countries.*

Area 6.4.2.2. Sustainable development indicators

ENV.2007.4.2.2.1. Bridging mainstream indicators of economic performance with sustainable development objectives

The aim of this project is to propose strategies to further align mainstream economic performance indicators with the objectives of the renewed sustainable development strategy. The project will review and update the existing critical analysis of Gross Domestic Product as an indicator of economic development. It will review in particular its shortcomings for measuring progress towards the objectives of the sustainable development strategy, such as intra- and inter-generational equity, protection of public health, environmental degradation, and depletion of natural resources. The study will also investigate to what extent these analyses and their conclusions have been taken up by institutions (e.g. UN, World Bank, OECD, EU and national), and the reasons behind it.

Proposals for alternative indicators will also be scrutinized. The research will assess to what extent these indicators perform with regards to the goals of the Lisbon strategy (employment and competitiveness) while taking into account the issues related to the objectives of the sustainable development strategy. The research will formulate recommendations for composite mainstream indicators compatible with sustainable development to extend core systems of national income accounting. It will provide concrete examples of estimations across countries, as well as a roadmap for their implementation. Sensitivity analysis will be included in the methodology, as well as validation processes, in particular through participatory methods.

Funding scheme: collaborative projects (small or medium-scale focused research projects)

***Expected impact**: Improved follow up of progress towards the objectives of the renewed EU sustainable development strategy*

Area 6.4.2.3. Interplay between social, economic and ecological systems

ENV.2007.4.2.3.1. Policies to promote sustainable consumption patterns

The impact of policy instruments on consumption patterns, with special regard to their sustainability, will be systematically analysed. These instruments include public procurement, market based instruments, fiscal policies and other regulation instruments at EU and Member State level. The conditions of failure and success of sustainable consumption strategies will also be carefully analysed. The research will build on previous work and mobilise all relevant disciplines including social sciences. Collective behaviour, consumers' attitudes, business strategies and institutional settings will be scrutinised. The international dimension of the sustainability of consumption patterns will be explored. Based on these two types of results (impact of policies on consumption patterns and outcome of sustainable consumption strategies), options to enhance sustainable consumption patterns will be proposed. They will include a detailed presentation of policies and operational instruments, among which foreseen monitoring practices. Their expected impact will be assessed through quantitative and qualitative methods.

Funding scheme: collaborative projects (small or medium-scale focused research projects)

***Expected impact:** Improved sustainability of consumption patterns in Europe and enhanced contributions to the renewed EU sustainable development strategy and the Lisbon agenda. Enhanced EU contribution to the Marrakech process.*

ENV.2007.4.2.3.2. Engaging civil society in research on sustainable development[28]

Civil society organisations[29] are invited to provide new insights, complementary to those of the scientific community and industry, to identify gaps in knowledge and in the research agenda for sustainable development. On this basis, CSOs will outsource research activities to RTD performers in fields such as the decoupling between economic growth and environmental damage and/or the interplay between social, economic and ecological systems. The focus will be on indicators, assessment tools and policy strategies, and how their efficiency can be increased taking into account visions and interests of different stakeholders as well as handling of the multiple dilemmas to which policy-makers are confronted. Exploratory actions of small scale to prepare future partnerships can also be envisaged.

[28] This action will be executed in co-ordination with and complementary to the activities of the Theme 8 "Socio-economic sciences and Humanities" of the Co-operation specific programme and of the "Science and society" part of the Capacities specific programme.

[29] The definition of civil society organisation is included in the presentation of the funding schemes (page 7-8).

Funding scheme: **Research for the benefit of specific groups or coordination and support actions (coordinating type or supporting type)**

Expected impact*: Increased involvement of civil society organisations in research, and consequently, increased contribution of research to sustainable development. These projects will allow also the creation of partnerships between civil society organisations and research organisations.*

Activity 6.5. HORIZONTAL ACTIONS

Indicative available budget: 3 M€

Sub-activity 6.5.1. Dissemination and horizontal activities

ENV.2007.5.1.1.1. Transnational co-operation among NCPs

Reinforcing the network of National Contact Points (NCP) for the Seventh Framework Programme under the Theme "Environment (including Climate Change), by promoting trans-national co-operation. The action will focus on identifying and sharing good practices. This may entail various mechanisms such as benchmarking, joint workshops, training, and twinning schemes. Practical initiatives to benefit cross-border audiences may also be included, such as trans-national brokerage events. The specific approach should be adapted to the nature of the theme and to the capacities and priorities of the NCPs concerned.

Special attention will be given to helping less experienced NCPs rapidly acquire the know-how accumulated in other countries. Proposals are expected to include all NCPs who have been officially appointed by the relevant national authorities. Other participants from the EU and associated countries are ineligible. If certain NCPs wish to abstain from participating, this fact should be explicitly documented in the proposal. The action should also involve official FP7 contacts from the international cooperation partner countries. It is expected that the project should in any case finish before March 2013.

Funding scheme: **coordination and support actions (coordinating type)**

> ***Expected impact:*** *An improved NCP service across Europe, therefore helping simplify access to FP7 calls, lowering the entry barriers for newcomers, and raising the average quality of submitted proposals. A more consistent level of NCP support services across Europe. More effective participation of organisation from third countries, alongside European organisations, in line with the principle of mutual benefit.*

Indicative budget for the Environment Theme for the 2007 Work Programme

	2007*
Call ENV 2007	200 M €**
General activities (cf. Annex 4)	16.1 M €
Other activities: • Evaluations (2 M €) • Programme impact assessment(0.28 M €) • Support to the 2007 Activities of the GEO Secretariat) (0.6 M €)	2.9 M €
Estimated total budget allocation	219 M €

* Under the condition that the preliminary draft budget for 2007 is adopted without modifications by the budget authority.

** This amount includes an indicative amount of up to € 4 M for the ERA-NETs foreseen under this Theme – See Annex 4 (Table 2 - Overview of Activities and Topics mentioned in Cooperation Themes which are part of the FP7-ERANET-2007 –RTD joint call).

Summary of budget allocation to general activities for 2007 (cf. Annex 4)

Cordis	0.4 M €
Eureka/Research organisations	0.05 M €
COST	1.8 M €
ERA-NET	3.9 M €
RSFF	9.95 M €
Total	**16.1 M €**

III IMPLEMENTATION OF CALLS

- Call identifier: *FP7-ENV-2007-1*
- Date of publication[30]: 22 December 2006
- Deadline[31]: 2nd of May 2007 at 17:00, Brussels local time
- **Indicative budget:** *200 million EUR from the 2007 budget*[32] [33]

- Topics called:

ACTIVITY/ AREA	TOPICS CALLED	FUNDING SCHEMES
ACTIVITY 6.1.		
Sub-activity 6.1.1. Pressures on environment and climate		
1.1.1.	*ENV.2007.1.1.1.1. Stability of the ThermoHaline Circulation*	*Collaborative projects (large-scale integrating projects)*
1.1.2.	*ENV.2007.1.1.2.1. Megacities, air quality and climate*	*Collaborative projects (small or medium-scale focused research projects)*
1.1.3.	*ENV.2007.1.1.3.1. Ocean acidification and its consequences*	*Collaborative projects (large-scale integrating projects)*
1.1.4.	*Not open in 2007.*	
1.1.5.	*ENV.2007.1.1.5.1. Climate change impacts and adaptation strategies in water policies*	*Coordination and support actions (coordinating type or supporting type)*
1.1.5.	*ENV.2007.1.1.5.2. Climate change impacts on vulnerable mountain regions*	*Collaborative projects (large-scale integrating projects)*
1.1.5.	*ENV.2007.1.1.5.3. Past and future climate change impacts in the Parana-Plata river*	*Collaborative projects (small or medium-scale focused*

[30] The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

[31] At the time of the publication of the call, the Director-General responsible may delay this deadline by up to two months

[32] Under the condition that the preliminary draft budget for 2007 is adopted without modifications by the budget authority.

[33] This amount includes an indicative amount of up to € 4 M for the ERA-NETs foreseen under this Theme – See Annex 4 (Table 2 - Overview of Activities and Topics mentioned in Cooperation Themes which are part of the FP7-ERANET-2007 –RTD joint call).

	basin of South America	*research projects)*
1.1.6.	*ENV.2007.1.1.6.1. Full costs of climate change*	*Collaborative projects (small or medium-scale focused research projects)*
1.1.6.	*ENV.2007.1.1.6.2. Effectiveness of adaptation and mitigation measures related to changes of the hydrological cycle and its extremes*	*Collaborative projects (small or medium-scale focused research projects)*
1.1.6.	*EVN.2007.1.1.6.3. Impact and feed-backs of climate policies on land use and ecosystems in Europe*	*Collaborative projects (small or medium-scale focused research projects)*
1.1.6.	*ENV.2007.1.1.6.4. Exploitation and dissemination of climate change research results and public perception*	*Coordination and support actions (supporting type)*
Sub-activity 6.1.2. Environment and Health		
1.2.1.	*ENV.2007.1.2.1.1. Indoor air pollution in Europe: an emerging environmental issue*	*Collaborative projects (small or medium-scale focused research projects)*
1.2.1.	*ENV.2007.1.2.1.2. Environmental factors and their impact on reproduction and development*	*Collaborative projects (small or medium-scale focused research projects)*
1.2.2.	*ENV.2007.1.2.2.1. European network on human biomonitoring*	*Network of excellence*
1.2.2.	*ENV.2007.1.2.2.2. European cohort on air pollution*	*Collaborative projects (large-scale integrating projects)*
1.2.2.	*ENV.2007.1.2.2.3. Health impacts of drought and desertification including socio-economic aspects*	*Collaborative projects (small or medium-scale focused research projects)*
1.2.3.	*ENV.2007.1.2.3.2. Geographical information systems in support for environment and health research*	*Coordination and support actions (coordinating type)*
Sub-activity 6.1.3. Natural Hazards		
1.3.1.	*ENV.2007.1.3.1.1. European storm risk*	*Collaborative projects (small or medium-scale focused research projects)*
1.3.2.	*ENV.2007.1.3.2.1. Frame for better vulnerability assessment*	*Collaborative projects (small or medium-scale focused research projects)*
1.3.3.	*ENV.2007.1.3.3.1. Assessing and managing volcanic threat*	*Collaborative projects (small or medium-scale focused research projects)*

1.3.3.	*ENV.2007.1.3.3.2. Harmonising avalanche forecasting, risk mapping and warning*	*Collaborative projects (small or medium-scale focused research projects)*
1.3.3.	*ENV.2007.1.3.3.3. Investigating Europe's risk from droughts*	*Coordination and support actions (coordinating or supporting type)*
1.3.4.	*ENV.2007.1.3.4.1. European (multi) hazard database analysis*	*Coordination and support actions (supporting type)*
ACTIVITY 6.2. SUSTAINABLE MANAGEMENT OF RESOURCES		
Sub-activity 6.2.1. Conservation and sustainable management of natural and man-made resources and biodiversity		
2.1.1.	*Not open in 2007*	
2.1.2.	*ENV.2007.2.1.2.1. Assessing the ecological status of water bodies*	*Collaborative projects (large-scale integrating projects)*
2.1.2.	*ENV.2007.2.1.2.2. River basin twinning initiatives as a tool to implement EU initiatives*	*Collaborative projects (small or medium-scale focused research projects)*
2.1.2.	*ENV.2007.2.1.2.3. Temporary water bodies management*	*Collaborative projects (small or medium-scale focused research projects)*
2.1.2.	*ENV.2007.2.1.2.4. Integrated resource management in international co-operation partner countries*	*Coordination and support actions (supporting type)*
2.1.3.	*ENV.2007.2.1.3.1. Geographical transect approach to desertification*	*Collaborative projects (large-scale integrating projects)*
2.1.4.	*ENV.2007.2.1.4.1. Contribution of biodiversity to ecosystem services*	*Collaborative projects (small or medium-scale focused research projects)*
2.1.4.	*ENV.2007.2.1.4.2. Use of natural resources: the impact on biodiversity, ecosystem goods and services*	*Collaborative projects (small or medium-scale focused research projects)*
2.1.4.	*ENV.2007.2.1.4.3. Biodiversity values, sustainable use and livelihoods*	*Collaborative projects (small or medium-scale focused research projects)*
2.1.5.	*ENV.2007.2.1.2.1. Urban metabolism and resource optimisation in the urban fabric*	*Collaborative projects (small or medium-scale focused research projects)*
2.1.6.	*Not open in 2007.*	
Sub-activity 6.2.2. Management of marine environments		
2.2.1.	*ENV.2007.2.2.1.1. Development of*	*Collaborative projects*

	advanced ecosystem models methodologies for the management and sustainable use of resources	*(large-scale integrating projects)*
2.2.1.	*ENV.2007.2.2.1.2. Ecology of important marine species*	*Collaborative projects (small or medium-scale focused research projects)*
2.2.1.	*ENV.2007.2.2.1.3. Habitat-marine species interactions in view of ecosystem based management in the deep-sea*	*Collaborative projects (large-scale integrating projects)*
2.2.1.	*ENV.2007.2.2.1.4. Dynamic of marine ecosystem in a changing environment*	*Collaborative projects (large-scale integrating projects)*
2.2.1.	*ENV.2007.2.2.1.5. Deep ocean geophysical and biological processes*	*Coordination and support actions (coordinating type)*
2.2.1.	*ENV.2007.2.2.1.6. Investigating life in extreme environments*	*Coordination and support actions (coordinating type)*
2.2.1.	*ENV.2007.2.2.1.7. Promoting access to information across marine themes*	*Coordination and support actions (supporting type)*
2.2.1.	*ENV.2007.2.2.1.8. Fostering improved co-operation between marine science and the private sector*	*Coordination and support actions (supporting type)*
2.2.1.	*ENV.2007.2.2.1.9. Access to and recovery of marine data from previous FP projects*	*Coordination and support actions (supporting type)*
ACTIVITY 6.3. ENVIRONMENTAL TECHNOLOGIES		
Sub-activity 6.3.1. Environmental technologies for observation, simulation, prevention, mitigation, adaptation, remediation and restoration of the natural and man-made environment		
3.1.1.	*ENV.2007.3.1.1.1. Innovative technologies and services for sustainable water use in industries*	*Collaborative projects (large-scale integrating projects)*
3.1.1.	*ENV.2007.3.1.1.2. Technologies for measuring and monitoring networks*	*Collaborative projects (small or medium-scale focused research projects)*
3.1.2.	*ENV.2007.3.1.2.1. Development and improvement of technologies for data collection in (digital) soil mapping*	*Collaborative projects (small or medium-scale focused research projects)*
3.1.2.	*ENV.2007.3.1.2.2. Development of technologies and tools for soil contamination assessment and site characterisation, towards sustainable remediation*	*Collaborative projects (small or medium-scale focused research projects)*
3.1.3.	*ENV.2007.3.1.3.1. Development of integrated waste management*	*Collaborative projects (large-scale integrating*

	technologies for maximising material and energy recovery/ recycling of the organic (humid) fraction of municipal solid waste	*projects)*
3.1.3.	*ENV.2007.3.1.3.2. New technologies for waste sorting*	*Collaborative projects (small or medium-scale focused research projects)*
3.1.3.	*ENV.2007.3.1.3.3. Networking and preparatory action in view of developing cost-effective, environmentally-safe waste treatment technologies and services adapted to the needs of developing countries, within a targeted life cycle approach*	*Coordination and support actions (coordinating type)*
3.1.4.	*ENV.2007.3.1.4.1. Networking and preparatory action in view of control of mercury in industrial processes and products*	*Coordination and support actions (coordinating type)*
3.1.5.	*ENV.2007.3.1.5.1. Low resource consumption buildings and infrastructure*	*Coordination and support actions (coordinating type)*
3.1.5.	*ENV.2007.3.1.5.2. Performance indicators for health, comfort and safety of the indoor built environment*	*Coordination and support actions (coordinating type)*
3.1.6.	*Not open in 2007*	
Sub-activity 6.3.2. Protection, conservation and enhancement of cultural heritage, including human habitat		
3.2.1.	*ENV.2007.3.2.1.1. Damage assessment, diagnosis and monitoring for the preventive conservation and maintenance of the cultural heritage*	*Collaborative projects (small or medium-scale focused research projects)*
3.2.2.	*ENV.2007.3.2.2.2. Consolidation and dissemination of results related to cultural heritage*	*Coordination and support actions (supporting type)*
3.2.3.	*Not open in 2007*	
3.2.4.	*Not open in 2007*	
Sub-activity 6.3.3. Technology assessment, verification and testing		
3.3.1.	*ENV.2007.3.3.1.1. In-silico techniques for hazard-, safety-, and environmental risk-assessment*	*Collaborative projects (small or medium-scale focused research projects)*
3.3.1.	*ENV.2007.3.3.1.2. Defining of a long-term research strategy for the full replacement of animal tests for repeat dose systemic toxicity*	*Coordination and support actions (coordinating type)*
3.3.2.	*Not open in 2007*	

3.3.3.	*Not open in 2007*	
ACTIVITY 6.4. EARTH OBSERVATION AND ASSESSMENT TOOLS FOR SUSTAINABLE DEVELOPMENT		
Sub-activity 6.4.1. Earth and ocean observation systems and monitoring methods for the environment and sustainable development		
4.1.1.	*ENV.2007.4.1.1.1. Monitoring of the carbon cycle at global level*	*Coordination and support actions (coordinating type)*
4.1.1.	*ENV.2007.4.1.1.2. Contribution to a global biodiversity observation system*	*Collaborative projects (small or medium-scale focused research projects)*
4.1.2.	*ENV.2007.4.1.2.1. Coordination of national earth observation programmes in view of their long-term integration and sustainability*	*Coordination and support actions (coordinating type)*
4.1.2.	*ENV.2007.4.1.2.2. Contributing to the development of a worldwide network of in-situ observatories for seismogenic hazards*	*Collaborative projects (small or medium-scale focused research projects)*
4.1.2.	*ENV.2007.4.1.2.3. Dissemination and broadcasting of scientific data and information*	*Coordination and support actions (supporting type)*
4.1.3.	*ENV.2007.4.1.3.1. Application of Earth Observations to environmental and health issues*	*Coordination and support actions (supporting type)*
4.1.3.	*ENV.2007.4.1.3.2. Monitoring the ocean interior, seafloor, and subseafloor*	*Collaborative projects (small or medium-scale focused research projects)*
4.1.3.	*ENV.2007.4.1.3.3. Development of a Global Soil Observing System*	*Collaborative projects (small or medium-scale focused research projects)*
4.1.4.	*ENV.2007.4.1.4.1. Georesource information system for Africa*	*Coordination and support actions (supporting type)*
4.1.4.	*ENV.2007.4.1.4.2. Improving observing systems for water resource management*	*Collaborative projects (small or medium-scale focused research projects)*
4.1.4.	*ENV.2007.4.1.4.3. GEONETCast applications for developing countries*	*Coordination and support actions (supporting type)*
Sub-activity 6.4.2. Forecasting methods and assessment tools for sustainable development taking into account different scales of observation		
4.2.1.	*ENV.2007.4.2.1.1. Methodologies for scaling down to the regional and local level the analysis of policy impacts on multifunctional land uses and the*	*Collaborative projects (small or medium-scale focused research projects)*

	economic activity	

4.2.1.	*ENV.2007.4.2.1.2. Improved tools to analyse the sustainable development implications of the EU financial perspective revision (2008-2009)*	*Collaborative projects (small or medium-scale focused research projects)*
4.2.1.	*ENV.2007.4.2.1.3. Tools for impact assessment of sustainable development policies in international collaboration partner countries*	*Collaborative projects (small or medium-scale focused research projects)*
4.2.2.	*ENV.2007.4.2.2.1. Bridging mainstream indicators of economic performance with sustainable development objectives*	*Collaborative projects (small or medium-scale focused research projects)*
4.2.3.	*ENV.2007.4.2.3.1. Policies to promote sustainable consumption patterns*	*Collaborative projects (small or medium-scale focused research projects)*
4.2.3.	*ENV.2007.4.2.3.2. Engaging civil society in research on sustainable development*	*Research for the benefit of specific groups or coordination and support actions (coordinating or supporting type)*
ACTIVITY 6.5. HORIZONTAL ACTIONS		
Sub-activity 6.5.1. Dissemination and horizontal activities		
5.1.1	*ENV.2007.5.1.1.1. Transnational co-operation among NCPs*	*Coordination and support actions (coordinating type)*

- Evaluation procedure:
  - A one-stage submission procedure will be followed.
  - Proposals may be evaluated remotely.
  - The evaluation criteria (including weights and thresholds) and sub-criteria together with the eligibility, selection and aware criteria for the different funding schemes are set out in annex 2 to this work programme
- Indicative evaluation and contractual timetable:
  Evaluations are expected to be carried out during the month of May-June 2007. It is expected that the contract negotiations for the shortlisted proposals will be opened in June/ July 2007. A reserve list may be established.

- Consortia agreements:
  Participants in collaborative projects (large-scale integrating projects) and in the Networks of Excellence are required to conclude consortium agreements.

- Particular requirements for participation, evaluation and implementation:
  The minimum number of participating legal entities for all funding schemes is set out in the Rules for Participation and presented in the relevant parts below.

Funding scheme	**Minimum conditions**
Collaborative projects	At least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC
Collaborative project for specific cooperation actions dedicated to international cooperation partner countries	At least 4 independent legal entities. Of these, 2 must be established in different MS or AC. The other 2 must be established in different international cooperation partner countries.
Network of Excellence	At least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC
Coordination and support actions (coordinating type)	At least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC
Coordination and support actions (supporting type)	At least 1 independent legal entity.
Research for the benefit of specific groups	At least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC. At least 1 of the legal entities has to be a civil society organisation (CSO).

- The forms of grants and maximum reimbursement rates which will be offered are specified in Annex 3 to the Cooperation work programme.

IV INDICATIVE TOPICS FOR FUTURE YEARS

Activity: CLIMATE CHANGE, POLLUTION, AND RISKS

Sub-activity: Pressures on environment and climate

- Sea-level rise and climate change
- Earth system dynamics: Palaeoenvironmental analysis
- Lower-middle atmospheric interactions
- Quantification of changing surface UV radiation levels
- Integrated assessment of climate change, air quality and energy security
- The impact of climate variability and extremes on greenhouse gas exchange, storage and soil organic matter
- Integrated carbon budgets of the ocean, land and atmosphere as a function of time
- Disturbance of soil functioning due to climate change
- Assessment of European research activities and results on carbon and nitrogen cycles.
- New components in earth system models
- Provision of local scale climate information
- Impacts of current and future climate conditions including extreme hydro-meteorological events on regional water budgets, ecosystems, agricultural and industrial systems and land use in Europe.
- Assess global and regional impacts of major climate risks/tipping points (such as west Antarctic, etc)
- Assessment of European climate research activities and results in ice-covered regions
- Impact of climate change on biodiversity and ecosystems
- Identify resilient adaptation strategies building on physical, engineering, social, and ecological sciences addressing social learning and the limits to adaptation especially in vulnerable areas
- Analysis of optimal climate policy strategies that account for high uncertainty and risks related to climate change as well as uncertainty in mitigation costs
- Assessment of the effectiveness and costs of emerging radical response strategies to limit climate change (e.g. geo-engineering, combined biomass use and carbon capture).

Impacts of climate change on long-term flood risk assessment and scenarios

Sub-activity: Environment and Health

- Risk assessment of exposure to neurotoxicants in children
- European network of excellence on noise

- Risk assessment of exposure to electromagnetic fields
- Health risks due to the spreading of contaminants resulting from climate change in the Arctic
- Health impacts linked to biodiversity changes
- Integrated risk assessment of contaminated soil and water quality in urban settings
- Integrated environment and health risk assessment of chemicals
- Public perception, behaviour and response to health risks
- Biomarkers of susceptibility to environmental carcinogens for risk analysis and policy development
- 'Environmental Burden of Disease' concept in health impact assessments
- Microbial biomonitoring systems for environmental quality and human health
- Toxicology toolbox for Europe
- Dissemination of policy-relevant E&H research results

Sub-activity: Natural hazards

- Towards better prediction of landslides events
- Generation, propagation and fate of sediment and debris in extreme floods
- Vulnerability assessment of buildings, lifelines systems and network related to earthquakes
- Environmental, social and economical assessment and management of flood: Present and future scenarios, for EU and key areas in non EU countries
- Environmental, social and economical assessment of drought risk approaches (EU and non EU perspective)
- Public perception, behaviour and response to risks
- Seismic and other geo-hazards risk assessment and mitigation for built environment and infrastructures
- Towards a European science research agenda in support to the UN strategy for disasters reduction and its European national initiatives
- Assessment of socio-economic benefit of prevention and mitigation strategies and plans
- Climate change and social impacts on wild fires regimes and landscape recovery

Activity: SUSTAINABLE MANAGEMENT OF RESOURCES

Sub-activity: Conservation and sustainable management of natural and man-made resources and biodiversity

- Threshold and points of no-return for the use of natural resource services
- Groundwater systems management
- Assessing the patterns and dynamics of river basins
- Water quantity and quality: long term scenarios
- Models for integrated management of water resources
- Water monitoring system
- River basin twinning initiatives
- Soil monitoring and observation for soil management
- Soil processes modelling
- The role of soil biodiversity as an environmental service
- The relationship between soil and climate change: evolution and perspectives in the medium to long term
- Transect approach to desertification
- Soils and ecosystems in a changing world to answer future energy challenges
- Soils and international cooperation partner countries (e.g. the problem of manure)
- Long-term biodiversity monitoring and assessment
- Ecological value of Protected Area Networks; Incentives for restoration
- Contribute to the Tree of Life
- Anthropogenic influence on evolution including micro-evolution
- Contribution of biodiversity to ecosystem goods and services in Europe and other parts of the world
- Use of natural resources: the impact on biodiversity and ecosystem goods and services in Europe and other parts of the world
- Ecosystem Millennium Assessment: focusing on the conclusions for Europe
- Examine the distribution of economic, social and environmental costs and benefits of conservation and use of biodiversity and its implication on decision-making, and improve understanding of how biodiversity policy is formed and implemented in relation to other policies
- Develop guidelines and tools to allow regional actors in spatial planning to define appropriate and feasible biodiversity related targets and determine ecologically sustainable spatial designs of future landscapes

- Improving the understanding of urban systems functioning and their dynamics, stressing in particular their multifunctional aspects, the relation with their hinterlands and their sensitivity to external drivers
- Development and testing of innovative concepts for integrated water/ agriculture/ tourism/ industry/ waste/ energy management in developing countries with a strong tourism sector
- High-resolution monitoring of forest cover and density in key tropical regions
- Carbon dynamics in forest ecosystems (this would include both above ground and below ground carbon)
- The role of forest in biodiversity protection
- The role of forests in water and soil protection
- Environment management in the companies, environment management models, resource management tools and best environmental practices

Sub-activity: Management of marine environments

- Socio-economic drivers and spatial dynamics in coastal areas
- Monitoring and Evaluation of SMA (Spatially Managed Areas)
- Deep Ocean geophysical and biological processes: research on “hot” topics
- Deep-Sea Biodiversity and ecosystems: Socio-economic and governance aspects
- Exploration and Exploitation of Gas Hydrates including in regional seas e.g. Black sea
- How does the marine ecosystem evolve in a changing environment?
- Understanding and Forecasting Bioinvasions into Marine and Coastal Ecosystems
- Ecosystem assimilative capacity related to aquaculture activities

Activity: ENVIRONMENTAL TECHNOLOGIES

Sub-activity: Environmental technologies for observation, simulation, prevention, mitigation, adaptation, remediation and restoration of the natural and man-made environment

- Restoration of degraded water resources
- Groundwater protection and remediation
- Development of improved centralised and decentralised low cost sustainable solutions for water supply and sanitation in peri-urban areas in developing countries
- Advanced technologies for soil erosion and shallow mass movements assessment and monitoring
- Emerging threats for soil/groundwater contamination in Europe: available technologies and research needs

- Waste prevention through the whole life-cycle chain: from eco-design to industrial ecology
- High temperature thermal treatments for hazardous waste management
- On-line process control for improved waste treatment technologies
- Eco-Efficiency in selected European industrial sectors
- Substitution of priority pollutants and of chemicals subject to restrictions
- Benchmarking performance and sustainability of the built environment
- Improved safety of the built environment.
- Reduced impact of the built environment on greenfield sites and landscape through facilitating brownfield reuse
- Robust – and low-cost – sensors (including bio- and geo-chemical ones) delivering reliable operation in the marine environment

Sub-activity: Protection, conservation and enhancement of cultural heritage, including human habitat

- Technologies and tools for the assessment and monitoring of environmental impacts on cultural heritage materials
- "EU cultural heritage identity card" (immovable/movable): -Development of strategy and tools for tracking of changes of cultural heritage building and monuments, including deterioration processes and intervention. - Traceability and security of movable cultural assets
- Disaster prevention model of heritage building and monuments (in coordination with FP7 NMP Theme)
- Coordination and Support Action(s): Framework conditions to enhance most promising prototypes resulting from previous FP5-FP6 projects requiring further concertation or networking for effective applicability developments
- Coordination and Support Action(s): Strategy for furthering recommendations, guidelines and best practices for accepted methodologies, thresholds and standards in cultural heritage, in support to CEN work, and benefiting all end-users (SMEs)

Sub-activity: Technology assessment, verification and testing

- Development of a methodology for technology assessment based on life cycle thinking
- Use of non-vertebrate organisms at the place of vertebrate organisms for safety testing of chemicals for endpoints for which no alternative testing (in vitro/in silico) exists

Activity: EARTH OBSERVATION AND ASSESSMENT TOOLS FOR SUSTAINABLE DEVELOPMENT

Sub-activity: Earth and ocean observation systems and monitoring methods for the environment and sustainable development

- Networking arctic and antarctic observing systems
- Emerging ocean observation systems on ship of opportunities and gliders
- Sea level observing systems
- Integration of socio-economic data with environmental observations
- Contribution to the development Shared Environment Information System and to the Global Spatial Data Infrastructure (GSDI)
- Support to GEONETCast in order to make it available on the longer terms to developing countries

Sub-activity: Forecasting methods and assessment tools for sustainable development taking into account differing scales of observation

- Long-term visionary concepts of sustainable development and its qualitative analysis
- Strategies to transform the environment challenge into an economic development opportunity
- Impact assessment taking into account the external dimension of sustainable development and the costs of inaction
- Improving and developing indicators for sustainable development
- European Social Innovation Platform
- Further analysis of the systematic interactions between the three dimensions of sustainable development (environment, social and economic)