PEER | Partnership for European Environmental Research

April 2004

PEER Position Paper on FP7

Europe faces two ambitious challenges:

- to become the most competitive and dynamic knowledge-based economy in the world[1];
- to assure a high level of quality of life and social well being for citizens by providing a healthy environment[2].

European citizens desire **economically, socially and environmentally favourable conditions.** The state of the environment and the conservation of natural resources **contribute strongly to the quality of life.** Moreover, the sustainable management of the natural resources provides stability and **new opportunities** of growth for the European knowledge-based economy, e.g. through multifunctional land use and the development of environmental technologies. Hence, the environmental sector responds directly to the challenges mentioned above.

The difficult task for Europe is to achieve these objectives in a globalized world. The scientific and technological capabilities are rapidly improving outside Europe and there is an increasing access to European markets for products from developing countries. Furthermore, disparities in wealth and environmental conditions are driving mass migration. In this situation it is demanding to prioritize **long-term environmental quality**, recognizing that the life-support systems of the earth are crucial for the development and sustainability of all human activities.

Following the definition of the above mentioned strategic goals set for the EU at the Lisbon 2000 European Council, the European Commission has taken important steps to push forward a better and sustainable quality of life by adopting the **European Union Strategy for Sustainable Development** at the Gothenburg 2001 European Council (COM(2001)264 final). Action has also been taken on a global level by endorsing the "Towards a global partnership for sustainable development" paper prepared for the 2002 Johannesburg Summit and recently the follow-up paper "The World Summit on Sustainable Development one year on" published in December 2003 (COM(2003)829 final).

The new Framework Programme should deepen our understanding of the interactions between environment, social and economic dimensions of sustainability. It should enhance the integration of research on different aspects of sustainable development and support public policies contributing to a better quality of life. The involvement of citizens needs also to be deepened through research supporting the improvement of participatory processes and environmental governance.

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[1] Decision of the Lisbon 2000 European Council

[2] Sixth Community Environment Action Programme, Article 2 (Decision 1600/2002/EC)

Comprehensive understanding of the functioning of ecosystems and the development of management options are pre-requisites for preserving environmental quality and for ensuring the sustainable use of natural resources. The need for this comprehensive understanding is not only expressed in the 6th EU Environment Action Programme and the GMES Initiative, but also in a large number of European Directives and Strategies, such as the Water Framework Directive, the Clean Air for Europe Initiative, and the emerging thematic strategies on Soil Protection and Marine Environments. Besides safeguarding our environmental resources, the direct interaction between our environment and a most crucial factor of well being – human health – still requires thorough investigation and will also be requested by the European Environment and Health Action Plan.

European Union is facing the **challenge of enlargement**. Environmental research in FP7 should strongly support solving environmental problems in the new Member States. Research can provide the basis for innovative solutions to overcome the decades of environmental deterioration that has caused a negative impact on quality of life. It should be stressed that the knowledge generated in the environmental sector has also a high potential for economic growth in the new Member States. FP7 should put special emphasis on the needs of small and medium-sized enterprises (SME), contributing directly to the EU Environmental Technology Action Plan. In addition, FP7 should support the formulation and implementation of Community policies by scientific contributions targeted **on the needs of the enlarged European Union and the new neighbours**.

To tackle complex environmental problems, basic and strategic research as well as their innovative applications are needed. The **development of tools and concepts** supporting environmental research (such as earth observations and other monitoring tools, modelling, evaluation methods of public policy, standards, measurement, testing) already initiated in FP6, should also be emphasised in the next Framework Programme.

All PEER members have been actively involved in a large number of projects and networks funded in previous Framework Programmes. Based on this motivation, PEER members propose to include in FP7 a separate research priority tentatively entitled **"Environmental Challenges for Sustainable Quality of Life"** (see annex). This specific priority will contribute to the integration by providing a framework for European efforts to develop strategic environmental research. The priority will also strengthen the global competitiveness of Europe in the environmental field.

With this initiative the PEER members wish to highlight urgent environmental research needs and challenges that should be taken into account in developing FP7.

This paper is submitted by the following institutions:

Alterra – Green World Research Centre, The Netherlands

CEH – Natural Environment Research Council - Centre for Ecology and Hydrology, United Kingdom

Cemagref – Centre for Agricultural and Environmental Engineering Research, France

NERI – National Environmental Research Institute, Denmark

SYKE – Finnish Environment Institute, Finland

UFZ – Centre for Environmental Research Leipzig-Halle, Germany

PEER Proposal for a research priority in FP7

Environmental Challenges for Sustainable Quality of Life

A. Managing ecosystems

European ecosystems are influenced by non-sustainable land-use, land-use change and pollution, and additional pressures from climate change are emerging, directly and through interaction with other drivers of global change. While several strategies for ecosystem management exist and are partly embedded in legal frameworks like the Convention on Biological Diversity ("Ecosystem Approach of the CBD") or the European Water Framework Directive, few comparative studies have been made on effectiveness of these approaches. Future research has to bring the experiences of these different approaches together and aid in the development of a strong common methodological core for an adaptive and integrated management of natural resources. In this context, the impact of EU policies, such as the Common Agricultural Policy, on the new Member States deserves special attention, as well as the management of highly fragile ecosystems in which environmental damage can have irreversible consequences. Research on ecosystem management, which is becoming increasingly important with evolving global change, should aim at connecting different scales, different scientific disciplines (in particular natural and social sciences) and different stakeholders thus supporting a **sustainable management of resources and ecosystem services.**

Evolutionary changes play an important role in the dynamics of ecological communities and their diversity. There is now increasing evidence that evolution can be very rapid and work on time scales relevant for ecosystem processes and management. The link between evolutionary change and ecological dynamics has to date received limited attention in ecology and ecosystem research. Evolutionary issues arise in research on land use change, plant and animal breeding, species exchange between regions and continents, as well as environmental chemicals.

B. Spatial development and ecosystem services

Europe is facing profound pressures due to demographic development and dramatic changes in land use. The changes are characterized by a combination of depopulating of rural areas and inner urban areas with urban sprawl. Research improving our understanding of the relationships between different spatial processes and the likely and potential effects of policy instruments in different sectors (e.g. agriculture, forestry, transport, regional and urban development) is of utmost importance for developing strategies for sustainable land use.

Besides agriculture and forestry, rural ecosystems can provide services and amenities (air and water quality, recreation, cultural and natural heritage) for citizens living in urban areas. This calls for new forms of multifunctional spatial development, such as the development of rural tourism and recreation combined with the conservation of biodiversity and other ecosystem services. **Tourism is today one of the most important economic sectors in Europe and largely relies on natural ecosystems and landscapes.** Research is called for to clarify the basis for the multifunctional development of the rural areas without compromising the sustainability of the ecosystems.

C. Facing climate change

Climate change remains one of the greatest challenges and threats Europe is facing in the years to come. Europe has been successful and world leading in the integration of terrestrial and atmospheric carbon sciences on a continental scale. Moreover, European research is leading in the field of climate predictions and adaptation strategies. Europe should target this research capacity to those questions which are crucial for developing successful adaptation and mitigation strategies for climate change not only in Europe, but also globally, enhancing co-operation with non-European partners in the field. This refers not only to the basic understanding of processes behind the climate change (e.g. C-cycles, N-cycles), but also to the effectiveness of different policy instruments, including emission trade. Their links to innovations and competitiveness should be important research themes.

The development, deployment and utilization of earth observation technologies (cf. GMES initiative) can contribute to climate change research by providing key information that can be used by modelling, geo-visualization and other tools. Special attention should be given to the integration of a wide range of potential user sectors in this activity, e.g. by developing the European Spatial Data Infrastructure INSPIRE. Research should provide tools for the integration and interpretation of spatial data, aiming at their global integration with similar data systems developed in other parts of the world.

D. Reducing natural and man-made environmental hazards and risks

Europe has become more vulnerable due to an increased likelihood of climatic extremes, but also due to man-made hazards like water contamination or marine oil spills. Increasing globalisation of travel and food production has significantly increased the risk of rapid trans-mission of pathogens. **Forecasting and mitigation tools** for natural and man-made hazards are still insufficiently developed. **New methodologies** are needed for holistic risk assessments that address stakeholder needs, the integration of multiple stressors and stressor pathways relevant for a given system, and that foster the development of relevant regulatory decision schemes.

There is a strong need to investigate further the impact of environmental conditions on human health. **Health impacts of environmental changes** are a source of growing concern for European citizens. It is estimated that around 25-33% of diseases in industrialized countries can be related to environmental factors. Environment-related diseases like water borne diseases, allergies or respiratory problems affect the well-being of European citizens and also cause significant losses to the European economy. The EU is about launching the first “Environment and Health Action Plan” for the period 2004-2010 requiring knowledge gaps to be filled. In particular, cumulative risks, risks of mixtures of compounds, transmission routes to human beings, long-term effects and especially long-term exposure to small doses, as well as the particularly sensitive groups, especially children, should be further studied.

E. Fostering environmental technologies

Decoupling of economic growth from increasing environmental pressure is one of the key issues for achieving sustainable development. The research should aim at providing knowledge that can be used to **develop new technologies which are "cleaner" or which**

make innovative use of natural processes and resources. Research into business strategies and the dynamic processes of innovation creates a basis for **novel policies and policy interventions** that support European global **competitiveness** in accordance with the European Environmental Technologies Action Plan.

Research that analyses the factors that determine the eco-efficiency provides a basis for public policies and policy interventions that aim at **increasing eco-efficiency** of both production and consumption. Research can provide the basis for **innovative solutions** that allow more rapid recovery of degraded sites to overcome the decades of environmental deterioration that have caused a negative impact on quality of life, especially in the industrialized regions of the new Member States. Research into the ways of addressing deteriorated sites will support the effective implementation of European environmental policies.

F. Environmental governance in an enlarged European Union

In order to deal with the increasing complexity and uncertainty of global environmental challenges governance structures in an enlarged EU need to be improved. Environmental policies in the Member States are mainly driven by Community legislation. Research on **environmental decision-making and policy processes** is essential to enhance the capability of European institutions to promote citizens' participation and to integrate different value systems, cultural traditions, and the increasing body of scientific knowledge. The Aarhus Convention on access to information, public participation in decision-making and access to justice in environmental matters calls for the development of new approaches and practices.

Recommended Instruments

PEER strongly supports the further integration of European research and notes that all the instruments used in FP6 can contribute to this integration. A careful evaluation of the contribution and functionality of the different instruments should be made in order to decide on an appropriate balance between instruments in FP7. PEER also proposes to adopt a new ERA-NET-type instrument targeted to institutions and organisations implementing national or regional research programmes in order to further strengthen the European Research Area.

PEER

Partnership for European Environmental Research

On the 10th of August 2001 in Helsinki five leading national environmental research centres in Europe decided to found the ”Partnership for European Environmental Research Initiative" (PEER) with the aim of combining their forces in order to follow a joint strategy in environmental sciences and to enhance research on ecological sustainability. Presently, PEER has seven member organisations employing together more than 4500 persons and having an overall annual budget of 340 Million Euro:

Alterra - Green World Research Centre (The Netherlands)

CEH - Centre for Ecology and Hydrology (United Kingdom)

Cemagref - Centre for Agricultural and Environmental Engineering Research (France)

JRC-IES - Institute for Environment and Sustainability (European Commission)

NERI - National Environmental Research Institute (Denmark)

SYKE - Finnish Environment Institute (Finland)

UFZ - Centre for Environmental Research (Germany)

All PEER members are extra-university research centres with scientific autonomy financed mainly by national and/or European public budgets. The outstanding strength of the PEER members is to aggregate, synthesize and integrate knowledge from the most diverse disciplines from natural and social sciences with the aim to offer interdisciplinary expertise for complex environmental problems through basic and applied research.

Among the specific aims of PEER are to develop and promote joint strategies in environmental research in support of both EU and national policies, to improve the competitiveness of European environmental research, to create opportunities for the exchange of scientific personnel and the training of young scientists, and to develop large-scale and long-term European research projects and programmes.

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