

Strategic Research Agenda: Environmental Research Priorities for Croatia

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Members of national delegation

□ Two leading scientists

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□ NCP

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□ One thematic expert from the relevant ministry

OUTLINE of presentation

- ❑ The Croatian Environmental policy framework
- ❑ Overview of ENVIRONMENT research activities
- ❑ Integration of Croatia in the European research area in the field of environment
- ❑ SWOT analysis of ENVIRONMENTAL research capacity in Croatia
- ❑ Environmental research priorities for Croatia

The Croatian Environmental policy framework

The national environmental policy framework in Croatia includes:

- ❑ Strategic Development Framework 2006-2013 (SDF) which is the overarching document;
- ❑ National Environmental Strategy (NES);
and
- ❑ National Environmental Action Plan (NEAP).

The Croatian Science and Technology policy framework

- Science and Technology Policy of the Republic of Croatia 2006-2010;
- Action Plan 2007-2010 Science and Technology Policy of the Republic of Croatia. → short and long term priorities

Action Plan 2007-2010

short-term priorities

- Environment (Adriatic Sea, coast and islands; Karst region)
- Health (Food; Agriculture; Biotechnology; Social aspects of health; Health systems)
- Energy and Materials (Alternative and renewable energy; Bio-nanomaterials)
- Croatian Identity (Croatian contribution to culture, religion, art and sciences; Croatian language)

Action Plan 2007-2010

long-term priorities

- ❑ Knowledge-driven basic research
- ❑ Environmental protection and economic development of the Karst regions; Adriatic Sea, coast and islands
- ❑ Agriculture; Biotechnology; Food
- ❑ Health
- ❑ Information and communication technologies
- ❑ Nanoscience; New materials, construction and new production processes
- ❑ Energy; Sources of alternative and renewable energy; Transport and security
- ❑ Social and human sciences; Croatian identity
- ❑ Social integration, learning and education; Lifelong learning

Overview of ENVIRONMENT research activities

Since the **environment** does not exist as separate research area or category in official funded projects databases, the overview presented here is far from being complete or comprehensive.

State agencies responsible for funding S&T research activities:

- ❑ Ministry of Science, Education and Sports;
- ❑ National Foundation for Science, Higher Education and Technological Development;
- ❑ Croatian Institute of Technology;
- ❑ Unity Through Knowledge Fund.

Main performers of environmental research activities

1. Ruđer Bošković Institute
2. University of Zagreb, Faculty of Science
3. University of Zagreb, Faculty of Chemical Engineering and Technology
4. Institute of Oceanography and Fisheries
5. University of Zagreb, Faculty of Agriculture
6. Institute for Medical Research and Occupational Health
7. University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture
8. University of Zagreb, Faculty of Textile Technology
9. University of Zagreb, Faculty of Veterinary Medicine
10. University of Zagreb, Faculty of Electrical Engineering and Computing.

Overview of state agencies funds for R&D in the field of environment

| | Name | Financing R&D–Year 2007: Total amount in national currency | Financing R&D–Year 2007: Total amount in EUR |
|----|--|--|--|
| 1. | Ministry of Science, Education and Sports | 7,619,400.00 | 1,036,653.06 |
| 2. | National Foundation for Science, Higher Education and Technological Development of the | 1,579,331.00 | 214,874.97 |
| 3. | Croatian Institute of Technology | 1,831,000.00** | 249,115.65** |
| 4. | Unity Through Knowledge Fund | 1,470,000.00** | 200,000.00** |

** funds for multiannual projects

SWOT analysis of environmental research capacity in Croatia

Strenghts

- ❑ Environment (specifically for Adriatic Sea, coast and islands, Karst region) is second among identified 9 long-term and first among 4 short-term priorities for Croatia (Science & Technology Policy of the Republic of Croatia – Action plan 2007-2010)
- ❑ R&D funding growth
- ❑ Good international contacts
- ❑ Developed outgoing mobility
- ❑ Some groups have experience in international projects
- ❑ Number of researchers with expertise in advanced research technology
- ❑ Experience in knowledge transfer to industry, SMEs and government

Weaknessess

- ❑ Lack of specific research strategies
- ❑ Lack of human resources for research
- ❑ Fragmented research structure
- ❑ Lack of equipment for participation on international level
- ❑ No major research infrastructure specific for the field
- ❑ Weak domestic governmental support for R&D
- ❑ Weak incoming mobility
- ❑ Lack of cooperation in R&D on regional level

Opportunities

- ❑ Increased scientific productivity in the environmental field
- ❑ Better protection of environment in most sensitive areas
- ❑ Recognized R&D priorities on regional level
- ❑ Stronger cooperation in R&D on regional level
- ❑ Increased capacity to participate in research on international level
- ❑ Increased participation in FP7 and other EU programmes
- ❑ Better international contacts
- ❑ Developed ingoing mobility

Threats

- ❑ Limited R&D expenditure, especially concerning ongoing financial crisis
- ❑ Weak domestic governmental support for R&D
- ❑ Insufficient direct communication between research and industrial sectors
- ❑ Brain drain
- ❑ Global and local financial crisis
- ❑ Low private investments in R&D
- ❑ Local development plans do not focus on research issues

Environmental research priorities for Croatia

□ Sustainable management of resources

- Conservation and sustainable management of the Adriatic Sea including coastal zone and islands
- Conservation and sustainable management of the karst area

□ Environmental technologies

- Advanced water treatment systems for industrial and municipal sector
- Integrated waste management
- Ballast water issue

Sustainable management of resources

Conservation and sustainable management of the Adriatic Sea including coastal zone and islands

- ❑ An ecosystem-based approach, whereby activities affecting the marine and estuarine environment will be managed in an integrated manner promoting conservation (long-term objective) and sustainable use (e.g. periodic planning of fisheries) in an equitable way of coast and islands.
- ❑ An ecosystem-based approach focused on anthropogenic impacts e.g. marinas, shipyards, urban settlements, industrial activities, especially in vulnerable estuarine areas.
- ❑ A knowledge-based approach, in order to achieve better connection to policy-making.

Sustainable management of resources

Conservation and sustainable management of the karst area

- ❑ Development of integrated resources based on improved understanding of complex human-environment interactions in vulnerable karst region.
- ❑ Identification of reference sites and detection of hot spots like soil, surface and ground water contamination as well as air pollution in most endangered areas.
- ❑ Determination of the pollution immission and listing of pollution emitters in the area.

Environmental technologies

Advanced water treatment systems for industrial and municipal sector

- The aim is to develop environmental technologies with emphasis on innovative system solutions wherever conventional waste water technologies do not provide satisfactory results.
- The presence of active pharmaceutical ingredients and personal care products in surface waters is an emerging environmental issue and provides a new challenge to drinking water, wastewater, and water reuse treatment systems.

Environmental technologies

Integrated waste management

Introducing integrated waste management and the sanitation of existing effects arising from the inadequate management of waste are of particular importance in the achievement of sustainable development. It is therefore necessary to establish an integral waste management system which will provide:

- Reduction of the environmental impacts,
- Increased participation in separate collection programs for recyclables and hazardous waste,
- Opportunities for new or expanded services.

Environmental technologies

Ballast water issue

- It is well known that ballast water is the major pathway of transmission of non-indigenous species (NIS) across biogeographical boundaries. The ecological, economic and even human health impacts of aquatic bio-invasions are considerably more severe than all other forms of ship-sourced pollution.
- The only management strategy currently available for ships to reduce the introduction of NIS is open-ocean ballast water exchange (BWE). Due to obvious limitations of current practice of BWE, there is a great need to develop effective ballast water treatment technology (BWTT) that would provide technological alternative to BWE. Consequently, further research in the area of BWTT has to be fostered as it holds important role in Croatian S&T sector.

Good example of existing cooperation among WBCs

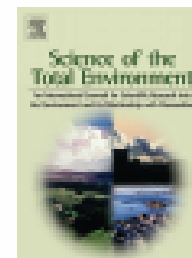
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Occurrence and fate of emerging wastewater contaminants in Western Balkan Region

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