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FOSTERING INTERNATIONAL COOPERATION FOR EXCELLENCE IN SCIENCE, TECHNOLOGY AND INNOVATION**

Abstract: The Research and Development (R&D) systems in Southeast Europe (SEE) cover a wide spectrum in terms of size, performance and influence exerted in the societal and economic settings of the Region at stake. However, in most SEE countries the domestic demand for R&D is poor and their systems face serious challenges, in particular science-oriented innovation which can ensure a more sustainable economic growth in the future.

Countries of SEE Region are supported in their efforts by international organizations like UNESCO, as well as by the bodies of Regional Organisation such as the European Commission. UNESCO's mandate in SEE focuses on reinforcing international cooperation in science and is oriented towards the establishment of peace, poverty eradication, sustainable development, intercultural dialogue and, and to a larger extend, the achievement of the Millennium Development Goals.

To this aim the UNESCO Venice Office encourages international scientific cooperation in Europe especially in South Eastern Europe and the Mediterranean Region through its activities oriented towards mobilising scientific knowledge and expertise, supporting national policies on research and innovation, higher education and environment; establishing cross disciplinary management plans, fundamental for cultural and natural heritage conservation (particularly for Biosphere Reserves and World Heritage sites), as well as popularizing science for youth and encouraging women in science.

The UVO has organized and conducted in recent years a series of activities devoted to the SEE society transformations in the fields of science, technology, innovation and education, in particular:

– the conference held in Chisinau in May 2007, mainly dedicated to the topic of the role of Academies in the context of Global Science and National Policies;

– the Science, Higher Education and Innovation Policy Forum organized in Budva in July 2008 which supported the adoption of a forward-looking approach in the governance of higher education and STI for the building of knowledge based societies in SEE;

– the Ministerial roundtable held in Albania in May 2010 titled „From Bilateral to Pan-European Cooperation" which approved a number of recommendations addressed to na-

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** The paper is given in terms of PowerPoint presentation.

tional governments with particular emphasis on strengthening the pan-European, regional and cross-border cooperation.

The conclusions of such conferences underlined that a sound and sustainable development of SEE countries require new Science, Education and Innovation policy strategies to better understand and manage scientific, technical and social changes. In this context, Academies will have a crucial role to play in supporting and defining the national and sub-regional strategy for policy and society development in SEE. Therefore, international cooperation should be able to create favourable condition for fostering excellence in R&D and increase innovation capacities.

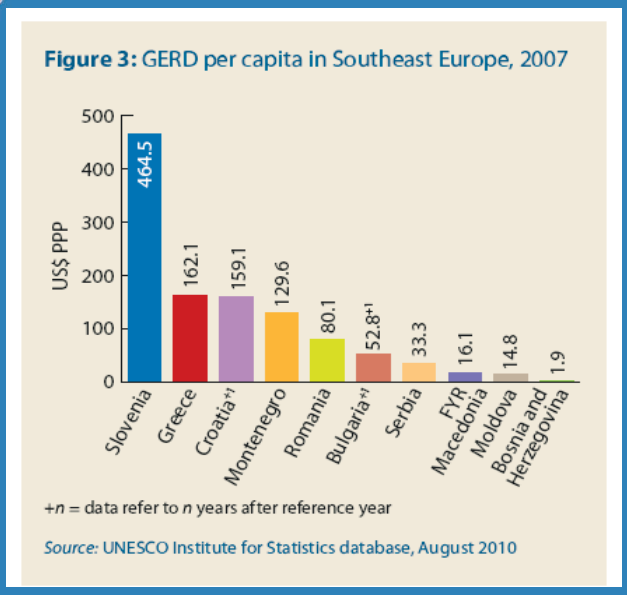
South East European countries

- → Contemporary Southeast Europe (SEE) is the most diverse region in Europe in terms of socio-economic development, institutional frameworks and the level of science and technology (S&T) capacity
- → Science, technology and innovation (STI) play very different roles in economic growth in the SEE
- → Their research and development (R&D) systems face acute challenges, in particular regarding science-oriented innovation
- → Weak demand for R&D: structure of industry; lack of capacity; brain drain
- → Growing number of tertiary graduates: demand for knowledge is becoming non-R&D-based

	Annual average growth rate, 2002–2008 (%)	GDP per capita, (current international) $PPP 2008	Unemployed (% of labour force) 2008
Albania	5.7	7 293	22.7[-7]
Bosnia and Herzegovina	5.6	8 095	29.0[-1]
Croatia	4.3	17 663	8.4
Rep. of Moldova	6.1	2 979	4.0
Serbia	5.2	10 544	13.6
Montenegro	6.4	13 385	30.3[-3]
Romania	6.8	13 449	5.8
Slovenia	4.6	27 866	4.4
Bulgaria	6.1	11 792	5.7
Greece	4.1	29 356	7.7
FYR Macedonia	4.3	9 337	33.8

There is a ten-fold difference in per-capita income between the richest (Greece and Slovenia) and poorest (Moldova) countries

Data Source: World Bank, KAM database, July 2010



SEE shows stagnation or a drop in the share of GDP invested in R&D.

Only Slovenia and Romania have managed to inverse the trend.

Serbia, is trying to make up lost ground

GERD: Gross domestic Expenditure on R&D

UNESCOVENICE Science for Technology & Innovation

Capacity for Innovation in SEE

	ranking	score
Bosnia and Herzegovina	121	2.3
Albania	120	2.3
Greece	101	2.6
Macedonia, FYR	86	2.7
Serbia	82	2.8
Bulgaria	73	2.9
Montenegro	71	2.9
Romania	64	3.0
Croatia	52	3.2
Turkey	46	3.3

WEF Global Competitiveness Report 2009-2010

UNESCOVENICE Science for Technology & Innovation

Quality of Scientific Research Institutions in SEE

	ranking	score
Albania	128	2.5
Bosnia and Herzegovina	126	2.6
Macedonia, FYR	90	3.4
Romania	82	3.5
Greece	77	3.6
Bulgaria	75	3.6
Turkey	71	3.6
Serbia	54	4.0
Croatia	50	4.1
Montenegro	47	4.1

WEF Global Competitiveness Report 2009-2010

UNESCOVENICE Science for Technology & Innovation

Company Spending on R&D in SEE

	ranking	score
Albania	126	2.3
Bosnia and Herzegovina	122	2.4
Macedonia, FYR	114	2.6
Serbia	110	2.6
Greece	101	2.6
Bulgaria	94	2.7
Turkey	76	2.9
Romania	74	2.9
Montenegro	59	3.1
Croatia	49	3.2

WEF Global Competitiveness Report 2009-2010

UNESCOVENICE Science for Technology & Innovation

Business and Universities collaborating in research and development in SEE

WEF Global Competitiveness Report 2009-2010

	ranking	score
Albania	133	2.2
Bosnia and Herzegovina	130	2.3
Bulgaria	102	3.0
Greece	90	3.2
Serbia	81	3.3
Macedonia, FYR	78	3.3
Romania	73	3.3
Turkey	67	3.4
Croatia	61	3.5
Montenegro	54	3.6

R&D OUTPUT

→ The current performance of R&D in Southeast Europe is strongly linked to investment per capita and to the overall level of development

→ Slovenia, Croatia and Greece are the biggest contributors in the region to world S&T in terms of three important indicators: the number of papers published per capita, the number of US patents obtained per capita and the amount received per capita in royalty payments and receipts

→ In this context, university–industry linkages are the most developed in Slovenia and Croatia

R&D output: Patents, publications, royalties

	Total royalty payments and receipts (US$ per capita) 2006	University–company research collaboration (scale of 1–7) 2007	Patents granted by USPTO (per million population) annual average 2002–2006
Albania	2.39	1.7	0
Bulgaria	10.38	2.7	0.74
Bosnia and Herzegovina	–	2.4	0.10
Croatia	50.02	3.6	2.45
Greece	42.53	2.9	1.87
FYR Macedonia	6.64	2.9	0.10
Moldova	1.48	2.3	0.33
Romania	10.22	2.7	0.34
Serbia	–	3.1	–
Slovenia	85.62	3.8	9.40

Source: World Bank, Knowledge for Development, KAM database, http://go.worldbank.org/JGAO5XE940, March 2009

Trade in licenses is a useful indicator for measuring performance not only in exchanging knowledge but also relates to both the size of R&D systems and to the technological level of industry

SCIENTIFIC PUBLICATION IN SEE

	2002	2008	change (%)
Albania	35	52	48.6
Bosnia and Herzegovina	35	287	720.0
Bulgaria	1 528	2 227	45.7
Croatia	1 254	2 348	87.2
Greece	5 588	9 296	66.4
FYR Macedonia	104	197	89.4
Moldova	160	223	39.4
Montenegro	–	93	–
Romania	2 127	4 975	133.9
Serbia*	1 003	2 729	172.1
Slovenia	1 609	2 766	71.9

* Serbia includes Montenegro for 2002.

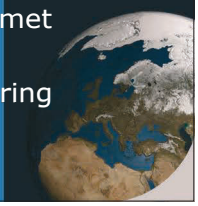
Published scientific papers are not only a key output of a country's science system; they also indicate the degree to which the country is integrated in the international scientific community. In this respect, Greece stands out in the region

UNESCO, STI and SEE
The Venice process

The Venice Conference of Experts on Rebuilding Scientific Co-operation in Southeastern Europe, held on 24–27 March 2001, launched the process for encouraging SEE countries to share limited resources and to heal the scars of a decade of political and socioeconomic turmoil.

In parallel, the process aims to build scientific co-operation between the subregion and the rest of Europe, in order to prepare countries for integration into the European Research Area.

The recommendations adopted by the conference met with the unanimous approval of the ministers responsible for science and technology from the countries concerned, at a roundtable organized during UNESCO's General Conference (December 2001).



International cooperation in SEE

The Venice process has been followed by various EU initiatives such as the SEE ERA-NET and the WBC INCO NET horizontal network that aims to structure and expand the European Research Area to the Western Balkan countries.

International co-operation may further improve with the integration since 2007 of the SEE into the EU Seventh Framework Programme for Research (FP7). The FP7 also represents a major opportunity for them to introduce the notion of excellence into evaluation criteria.

Beyond Europe, the major partner for individual countries in Southeast Europe is the USA, through bilateral co-operation.

Unesco Venice Office for Science and Culture (BRESCE)

Since 2002,UNESCO's Venice office has provided science policy advice and expertise to Southeast European countries, in order to raise awareness of the importance of investing in S&T for national and regional development.

In addition to gathering ministers and other high-level decision-makers together on issues related to STI governance, BRESCE has contributed to the elaboration of national STI strategies in Bosnia and Herzegovina and in Albania.

The Venice office has also provided financial support and organized programmes to encourage regional networking in life sciences, environmental sciences and astronomy as a means of tackling brain drain, supporting communication services and strengthening scientific co-operation as a tool for reconciliation and dialogue.

UNESCOVENICE Science for Society and Policy

Science and Society

1. **Share responsibility and embrace cooperative governance**
2. **Develop National Science and Education Policy Strategies**
3. **Knowledge-transfer: Improve information and dialogue between stakeholders**
4. **Focus on Mobility, Young scientists and women in Science**
5. **Institutionalize knowledge transfer**
6. **Increase Transparency**
7. **Assessment of STI & E activities**
8. **Create leadership in the field of Science**

UNESCOVENICE Science for Society and Policy

challenges for policy-making

• Understanding and managing the complexity and uncertainty of STI and education;
• responding to a new environmental, ethical and societal demands that require reorientation;
• finding an appropriate balance between public and private funding;
• ensuring an adequate infrastructure for the development of science and education;
• assuring the free flow and exchange of scientific information;
• improving science and technology policy's coherence and consistence through finding new forms of interaction between the scientific community, policy makers and society, as well as new institutional arrangements between the different areas of governance;
• creating participatory processes in S&E decision-making, involving a large number of partners that will integrate both the infra-national and supra-national dimensions; and,
• integrating future oriented, creative, non-linear thinking in decision making.

SCIENCE POLICY ANALYSIS/NEEDS ASSESSMENT

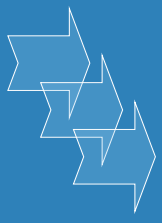
POLICY EVENTS

Ministerial Round Tables
(Paris 2001, Ljubljana 2007, Budva 2008, Tirana 2010)
Conference of Parliamentary Committees for S&T

Conferences on specific topics
Investment in S&T, (new) role of Academies of Sciences, Higher education and research linkages

Technical Workshops
STI Statistics and Indicators

National STI Strategies
Bosnia and Herzegovina, Albania, Serbia, FYROM



UNESCO Venice Office COMMUNICATING SCIENCE

Publications : science policy series

Science Policy Events

UNESCOVENICE Science for Society and Policy

From Bilateral to Pan-European Cooperation

- increasing capacities and enhancing role in the process of countries' general development;
- establish cooperation agreements, in the SEE region, defining clear targets and outcomes;
- open bilateral and regional cooperation to pan-European dimension;
- simplify funding schemes and better coordinate the support to researchers;
- promote cross-border cooperation between researchers
- open access to research facilities and infrastructures;
- develop evaluation and monitoring of regional cooperation in research
- focus on a limited number if common priority areas and the support to research centers able to participate in networks of centers of excellence;
- favor partnerships between the public and private sectors while taking into account their needs and specificities;
- motivate scientists and create more awareness and understanding for funding schemes, in particular on the EU Research Framework Programmes, and cooperation with Small and Medium Sized Enterprises (SMEs)

UNESCO Ministerial Roundtable Tirana, Albania May 2010


UNESCOVENICE
Academies for Society and Policy
Conclusions on International cooperation in Science & Innovation
→International cooperation creates favourable conditions for cross-disciplinary research, improving the overall quality and performance of innovation and research
→ Countries of SEE region are supported in their efforts by international organizations like UNESCO or EC; the EC programme frameworks support central aspect of international cooperation (mobility, coordination, dissemination, …)
UNESCO Ministerial roundtable Budva, Montenegro July 2008


UNESCOVENICE
Academies for Society and Policy
Recommendations on International cooperation in Science & Innovation
→it is important to create a favourable research environment at national level to facilitate the brain-drain
→It is vital to ensure that research in the region becomes competitive and to exploit existing EU and regional programmes: opening up national research system to regional and international cooperation
→ there is a need to identify regional infrastructures that can be inter-linked and to find mechanisms to provide access and to keep them updated at regional and European level
UNESCO Ministerial roundtable Budva, Montenegro July 2008

UNESCOVENICE Academies for Society and Policy

Recommendations on International cooperation in Science & Innovation

→there is a need for better administrative support for scientists allowing them to participate in a greater number of collaboration projects

→It is recommended to establish a technical support body to increase capacity and to facilitate access to funding programmes

→ defining new synergies to efficiently combine international, regional and national R&D strategies and strengthen their their implementation through cooperation

UNESCO Ministerial roundtable Budva, Montenegro July 2008

UNESCOVENICE Academies for Society and Policy

Role of the Academies

Academies of Sciences have an important role advising society and governments including priorities setting, linking science and society, as well as playing a bridging role between scientists and political authorities: their role is also seen as fostering moral and societal responsibility and public accountability.

UNESCO Ministerial roundtable Budva, Montenegro July 2008

UNESCOVENICE Science for Society and Policy

Global Science and National Policies – the role of the Academies

UNESCO conference Chisinau May 2007

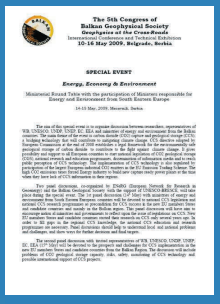
Actions for the future:

- Determine the mission and identity
- Reach out to the world:
  - national sciences policies,
  - media and public,
  - international cooperation,
- Modernize the internal organization:
  - Representativeness,
  - Younger generation,
  - New statutes.

SCIENCE POLICY CAPACITY-BUILDING & REGIONAL SCIENTIFIC CO-OPERATION IN BASIC AND ENGINEERING SCIENCES

Scientific networks
Seismology, astronomy, mathematics & physics

Sharing Research Infrastructures
(Rozhen Observatory)



The 5th Congress of Balkan Geophysical Society
Geophysics at the Cross-Roads
International Conference and Technical Exhibition
10-14 May 2009, Belgrade, Serbia.

SPECIAL EVENT

Energy, Economy & Environment

Ministerial Round Table with the participation of Ministers responsible for Energy and Environment from South Eastern Europe

14-15 May 2009, Mecavnik, Serbia

5th CONGRESS OF BALKAN GEOPHYSICAL SOCIETY
GEOPHYSICS AT THE CROSS – ROADS
International Conference and Technical Exhibition
10 – 14th May 2009 Belgrade

Forthcoming events

10-16 May 2009
5th Congress of Balkan Geophysical Society, *Geophysics at the Cross-Roads*
Belgrade, Serbia

10-23 August 2009
5th International Summer School in Renewable Energy and Energy Efficiency in SEE
Sarajevo, Bosnia & Herzegovina

19 September – 1 October 2009
International Biophysics Summer School
Rovinj, Croatia

October 2009
International School of Spectroscopy'
Rozhen, Bulgaria

4 November 2009
Basic Sciences for the Development of Energy: Alliance for the Future
Budapest, Hungary

UNESCOVENICE UNESCO Sience Policy Framework

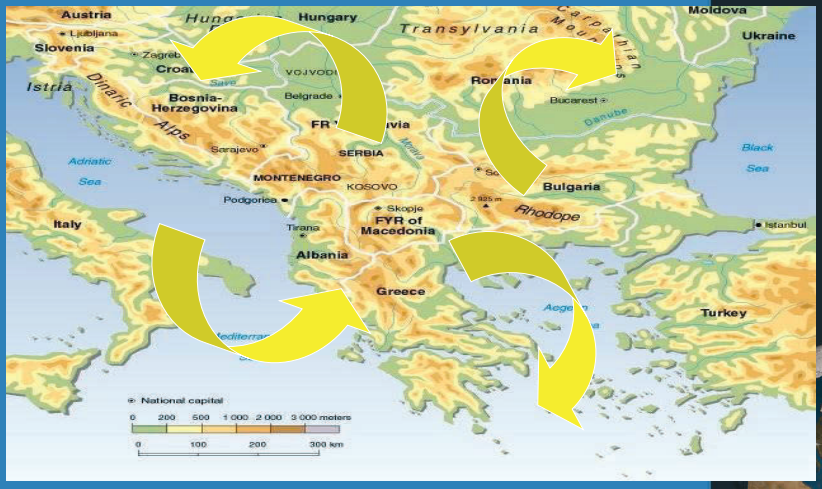
The Key focus for UNESCO actions

1. Science and Culture for Development should be entirely included into Delivering as One
2. Enhance sub-regional cooperation and definition of regional strategies and Centers for Competences
3. Deliver expertise in a fast manner and in high quality.
4. UNESCO has to Deliver as One to national and sub-regional development plans)
5. Actions should always lead to concrete results and impact for member states and/or civil society

UNESCO Venice Office contribution

UNESCO BRESCE MISSION

Fosters cooperation, to contribute to capacity building and to provide specialized expertise in science and culture with special emphasize to SEE and the Mediterranean




TARGETS
➢Contribute to peace, stability and sustainable development in Europe, especially in SEE and Mediterranean area,
➢through activities in the field of SCIENCE and CULTURE,
➢considering the political, social and environmental changes,
➢by providing policy advice, capacity building, communication and supporting territorial management as well as risk and conflict prevention
FUNCTIONS AND ROLE
DEVELOPMENT FUNCTION
COLLECTION, ANALYTICAL AND DISSEMINATION FUNCTION
CAPACITY-BUILDING FUNCTION
➢ institutional capacity building through policy advice
➢ increase the competences in the field of science and culture
➢ catalytic role of BRESCE
➢ communicate UNESCO BRESCE and its activities
➢ create a corporate image of BRESCE by focussing on interdisciplinary and inter sectoral actions


UNESCO Venice Office ACTIONS IN SCIENCE
Science Policy: Ministerial Round Tables, Conferences on S&T, STI Statistics and Indicators, National STI Strategies (Albania, BiH, Serbia)
Basic Science: Scientific networks in SEE: Seismology, astronomy, Mathematics & Physics
Hydrology: Water Governance, Danube, River corridors (Sava, Drin, Drava-Mura) and Lakes (Ohrid-Prespa, Skadar)
MAB/WH: Environmental Protection and Sustainable Development – Territorial Systems and Quality Economy
Education for Sustainable Development (ESD) in SEE and the Mediterranean countries
Climate change, Risk preparedness, Gender and youth in science