

## ***Chapter 25. Science and research***

The *acquis* in Chapter 25 – Science and Research – as laid down in Title XIX of the Treaty on the Functioning of the European Union (TFEU) requires the Member States, to take actions and carry out activities to achieve the European Research Area and take the necessary measures to ensure implementation of the research framework programme(s). The *acquis* in this Chapter does, in principle, not require transposition of EU rules into the national legal order.

EU research policy aims to strengthen the scientific and technological bases of the Union by realising a European Research Area (ERA) in which researchers, scientific knowledge and technology circulates freely and supports competitiveness, including by industry, while promoting all research activities necessary including by actions based on other EU policies. To advance towards the ERA, it is important that the Candidate Countries participate fully in the Research Framework Programmes (FPs).

Since FP6 (2002-2006) these programmes have been designed support the implementation of the ERA. They currently include: (1) the Seventh EU Framework Programme (2007-2013) of the European Union for research, technological development and demonstration activities for the creation of the European Research Area and for innovation (FP7), which is implemented through 4 Specific Programmes and the rules for the participation of undertakings, research centres and universities and for the dissemination of research results, for the implementation and (2) the Seventh Euratom Framework Programme for nuclear research and training activities (2007-2011) as a means to contribute to the creation of the European Research Area in the field of fission and fusion energy systems and radiation protection, and the specific programme and the rules for the participation in the Euratom Research Programme. As part of the research actions funded by the European Union, the Joint Research Centre (JRC) also organises direct actions through its seven specialised institutions. Furthermore, candidate countries are invited to participate in the policy initiatives carried out in partnership with Member States as a means to strengthen the ERA.

In March 2000, the Lisbon European Council set the objective for the EU to become the most competitive and dynamic knowledge-based economy in the world by 2010. As a first step, the Commission adopted in October 2000 a Communication on 'Towards a European Research Area' which identified Europe's weaknesses and strengths in research and laid down the foundations for reinforcing Europe's scientific excellence and competitiveness. Several other Communications and Action Plans have since then been adopted and are relevant to contribute to the creation of ERA. In particular the Communication adopted by the Barcelona European Council in 2002 on 'Investing in research: an Action Plan aiming at raising the overall investment in research and development to 3% of GDP by 2010 remains a key part of the ERA objectives. With respect to mobility of researchers, a Recommendation on the European Charter for Researchers and on a Code of Conduct for the Recruitment of Researchers (Mobility Action Plan) has been adopted. An Action Plan on Science and Society aims, amongst others, at scientifically based decision-making.

Following a 2007 public consultation on ERA and a Green Paper proposing six main ERA dimensions, the EU launched in 2008 a new partnership approach to research policy between the European Commission and the Member States, known as the Ljubljana Process. In this approach, ERA is regarded as embracing the totality of research activities, policies and programmes, whether at EU, intergovernmental, national or regional level, which have a transnational European perspective. The Ljubljana Process led to the adoption by the Council

in December 2008 of a 2020 Vision for ERA of which the core objective is to ensure the free movement of researchers and free circulation of scientific knowledge and technology (the so-called fifth freedom). Under the Ljubljana Process, the Council has called for a revised system of research policy governance to manage the new ERA partnership.

Policy development work is underway for all six dimensions of ERA. Five of these are the subject of specific ERA partnership initiatives launched in 2008 with the following aims:

- **Researchers:** to increase the number, quality and mobility of researchers and enhance Europe's attractiveness to researchers, focusing on open recruitment and portability of grants, social security and supplementary pensions needs of mobile researchers, employment and working conditions, and the training, skills and experience of European researchers.
- **Joint programming:** to make research in Europe more strategic, more focused and more effective through Member States coming together to discuss common visions, prepare strategic research agendas on major societal challenges and set up joint programmes to implement these agendas.
- **Research infrastructures:** to put in place a new EU-wide legal framework for the establishment and operation of new European research infrastructures (by means of a Council Regulation). ESFRI (European Strategic Forum for Research Infrastructures) continues to work on its roadmap for new pan-European research infrastructures.
- **Knowledge sharing:** to improve the exploitation of the results of public research by building on and implementing the Commission Recommendation and Council Resolution on the management of intellectual property in knowledge transfer activities, consisting of policy guidelines for Member States and a Code of Practice for public research organisations and universities.
- **International science and technology cooperation:** to establish a common strategy at European level for cooperation between Member States and the European Union with third countries in order to reduce the duplication, waste of resources and reduced impacts which result from the current fragmented approach.

In addition, other activities are underway to support national authorities and universities in the implementation of the EU 'modernisation agenda for universities' policy launched in 2005

Following the adoption EU 2020 Strategy for smart, sustainable and inclusive growth adopted by the Barroso II Commission in March 2010, the first flagship initiative aimed at building the Innovation Union (IU) was adopted in October 2010. As a result, Member States are expected to step up the efforts on the realisation of ERA and also to consider actions and measures on innovation. Candidate countries are expected to contribute to the objectives and targets of the IU.

Candidate countries will, upon accession, have to adhere to the bilateral and multilateral agreements the European Union has concluded on respectively science and technology and on nuclear research.

The FP7 management committees assisting the Commission in implementing the FP7 specific programmes, the European Research Area Committee (ERAC); the Strategic Form for International S&T co-operation (SFIC); the ERA steering Group on Human Resources and Mobility (SGHRM), the Knowledge Transfer Forum and the High Level Group on Joint Programming (GPC), as well as the Standing Committee for Agricultural Research (SCAR) are the key bodies in the designing and implementation of the EU research policy. Candidate countries associated to FP7 have been invited to nominate delegates in all ERA governance

bodies and attend as much as possible the meetings as a way to become familiar with EU decision-making on research policy.

Finally, a number of ad hoc decisions concerning research in specific areas need to be addressed, such as the European Research Fund for Coal and Steel and the creation of Article 169 undertakings and Joint Technology initiatives.

## I. National Research policy

### A. National Research policy

1. **Do you have a national strategy for research? When was it adopted and at which level? What was the role of Parliament in the adoption of the national policy?**

On 25 February 2010, the Government of the Republic of Serbia adopted the Strategy of Scientific and Technological Development of the Republic of Serbia for the period 2010-2015 (hereafter referred to as: the Strategy). Pursuant to Article 8, paragraph 1, of the Law on Scientific Research Activities (*Official Gazette of RS*, No. 110/05 and 50/06-corrigendum, hereafter referred to as the Law on R&D activities) and Article 45, paragraph 1, of the Law on Government (*Official Gazette of RS*, No. 55/05, 71/05-corrigendum, 101/07 and 65/08), the Government adopts the Strategy within scientific and technological development sector. Parliamentary Committee for Science and Technological Development has participated in the public consultation on the Draft Strategy. The final document has been presented to all Members of the Parliament in the Assembly.

2. **Did a public consultation take on the national strategy prior to adoption? Were the industry and other private sector parties consulted on the strategy?**

The public consultation on Draft Strategy begun on 29 June 2009, at the conference “Towards the Integration of Serbia into European Research Area”, attended by Mister Janez Potocnik, the European Commissioner for Science. The public consultation lasted until the end of October 2009. During the public consultation, conferences at the University centers in Serbia and thematic meetings in Belgrade on the scientific disciplines were organized. Furthermore, meetings with representatives of all relevant ministries and with representatives of domestic and foreign economy were also held. All interested citizen had a chance to deliver their comments via forum or e-mail. Over 400 comments, both domestic and foreign, have arrived this way and they have been considered by the Ministry. The Draft Strategy has been submitted to all European Ministers competent for science, and to representatives of the leading European Universities and Scientific Institutes who were asked to give their comments. The expert team of UNESCO also participated in the drawing up of the Strategy and contributed significantly to the improvement of the documents’ quality and to its harmonization with European and world standards.

3. **What are the main elements of the policy (see also questions under point III on the European Research Area)?**

The two key elements of the Strategy are: focus and partnership. Focus signifies definition of national priorities within the science and technology domain, and partnership reinforcement achieves critical mass in these domains, greater presence on the international science scene and stronger connection with the economy. The Strategy vision is the following: “Serbia as an innovative country, where scientists attain European standards, contribute to society’s overall level of knowledge and advance the technological development of the economy” The Strategy defines concrete steps that lead to the achievement of this vision, and necessary investments in science and technology domain.

Seven national priorities within science and technology domain defined by the Strategy are: biomedicine, new materials and nanosciences, environment protection and countering climate changes, energy and energy efficiency, agriculture and food, information and communication technologies and improvement of decision making process and affirmation of national identity.

In addition to defining national priorities, there is also emphasis on the significance of establishing stronger partnerships within the Serbian science community, and with international science community and international organisations, with the society, economy, Diaspora and other ministries.

The Strategy proposes the timetable of increasing investments in science and technology for 0.2% GDP per year, which would mean that, in 2015, Serbia would surpass 1% of GDP investments in science. In addition to the budget investments, the 400 million Euros investments into science and technology infrastructure are planned during the Strategy application and in cooperation with international financial institutions.

The AP Vojvodina whose institutions are integral part of the research area of the Republic of Serbia and which is referred to in strategic documents at the level of the Republic, defined a strategy at the level of the province called “Basic Directions of Technological Development of the Autonomous Province of Vojvodina”. This strategy was adopted by the AP Vojvodina Assembly in February 2007 and its main elements are in line with the national strategy.

**4. Who is responsible for the strategy at government level (Ministry, Agency)? Please describe the role and competence of the Ministry/Agency responsible for it? How is coordination with other Ministries/Agencies or government bodies and other related policies managed?**

The implementation of the Strategy is supervised by the Ministry of Science and Technological Development (hereafter referred to as: the Ministry) in cooperation with the Ministry of Education, Ministry of Economy and Regional Development, and other competent ministries, National Council for Science and Technological Development, National Council for Higher Education, Serbian Academy of Science and Arts, other advisory authorities, representatives of domestic and foreign companies. The Ministry is competent for implementation of the Integral and Interdisciplinary Research Programme that finances projects from the most important scientific areas, and for implementation of the investment cycle in scientific and technological infrastructure that is financed from the agreement with the European Investment Bank. The Ministry, in different domains, forms working bodies together with representatives of other ministries, scientific institutions or economy in order to realise concrete goals laid down in the Strategy (e.g. working group for resolving PhD studies issues in cooperation with the Ministry of Education).

The Ministry closely cooperates with the Provincial Secretariat for Science and Technological Development (hereinafter referred to as: the Provincial Secretariat) on the implementation of the strategy. At the level of the Province, the Secretariat relies on the European Affairs Fund, Fund for Investment Promotion (VIP), Centre for

Strategic Economic Studies (CESS) and expert system of the Fund for Capital Investments of AP Vojvodina.

**B. Funding of research at national level**

**5. How is research funding organised: duration of budget (annual or multi-annual)?**

Research projects are financed from the budget which is annually adopted and planned for 4 years. Besides the funds for financing national projects, there is also a Provincial fund and its planning documents for financing are for the period of 2-5 years, and budget basis is determined each year separately.

**6. Does consultation take place prior to adoption of budget?**

Yes, the consultations between the Portfolio Ministers and with the representatives of scientific population.

**7. What is the share of core budget funding vs. external competitive funding provided by other public sources to research institutions?**

The funding system is based mainly on the budget funds, 80 - 90% while the share of the other public sources of financing is 10 – 20%.

**8. How is the state funds allocated: please refer to the method and criteria used for the division of funds? Please specify in particular:**

**a) types and numbers of research institutions (higher education institutions, governmental research centres, military research centres, academies, private foundations, State or private industry research centres);**

The scientific research system of the republic of Serbia comprises the following institutions:

Accredited scientific research organizations (institutes, faculties, integrated universities and centres of excellence)

Serbian Academy of science and Arts- SANU

Matica Srpska

Higher education organizations and scientific research organizations which are established and conduct their activities according to regulations in the field of system of defence and Serbian Army pursuant to the Law on Research

Scientific-research institutions consist of: faculties which operate exclusively under the University, Scientific institutes and Research and Development institutes. Regarding the university, the Republic of Serbia has 17 universities and 129 faculties under these universities. Eight universities have in total 84 faculties founded by the state. There are six universities located in central Serbia (with 59 faculties), one in AP Vojvodina (with 15 faculties) and 1 in AP Kosovo and Metohija (with 10 faculties). There are five accredited private universities which have in total 46 faculties. Concerning scientific and research

activities in mentioned faculties, accreditation for research activities which is given by the Ministry, has been awarded to 122 faculties.

There are 28 accredited Scientific institutes and 32 Research and Development institutes in the Republic of Serbia.

The Serbian Academy of Science and Arts has 8 departments and 10 scientific institutes, while the Matica Srpska has 7 departments.

**b) centres of excellence, research infrastructures;**

Faculties, institutes and their organizational parts which, during the last five years and according to the criteria of the Ministry, have become national leader in their fields, have obtained the status of the centre of excellence.

There are two centres of excellence in the Republic of Serbia: Centre for Mathematical Research of Nonlinear Phenomena, Department of Mathematics and Informatics, Faculty of Science, Novi Sad and Centre for Solid State Physics and New Materials, Institute of Physics, Belgrade.

**c) nature of research activities (public or private, civil or military, institutional or contractual, applied or basic);**

The nature of research activities is defined in the Law on Scientific and Research Activities (Article 10) within the Programme of general interest for the Republic: Basic Researches Programme; Programme of research and technological development; Programme of transfer of knowledge and technologies and implementation of scientific research results; Program of scientific and research work of the Serbian Academy of Science and Art, and Programme of scientific and research work of Matica Srpska; Programme of scientific and research work of centre of excellence; Programme of provision and maintenance of science and research equipment and science and research facilities; Programme of international scientific cooperation important for the Republic; Programme of information society development; Programme of further education of scientific and research work experts; Program of encouraging of and scholarship allocating to the young talents for scientific research work; Programme of providing the scientific and professional literature from abroad and approach to the electronic scientific and professional data bases; Programme of publishing the scientific publications and organization of scientific meetings; Programme of encouraging activities of scientific and professional groups, associations and other organizations which are in function of improving the scientific research work, promotions and popularization of science and engineering and protection of science and technology heritage; Programme of the project co-financing of the doctoral studies; Programme of co-financing the construction of apartments for young researchers and scientists in Serbia; Programme of co-financing of integral and interdisciplinary researches; priority programmes defined by the Strategy, and other programmes defined by this law and other programmes, in line with the Strategy and this Law. In AP Vojvodina: the majority of researches are in nature the basic researches, than researches directed to the private sector and

only a small number of researches are directed towards the public sector and civilian sector.

- d) **what are the main research results per priority areas? Are there indicators for scientific production? Please refer to the number of scientific publications (in ISC or other biblio-metric database), number of patents or licences, number of research contracts or any other pertinent indicator to quantify scientific production;**

The scientific production indicators are the number of scientific works published in the worldwide known magazines, quality of scientific works measured by impact factor, and citation. The relevant data bases for scientific production monitoring are ISI Web of Science, Scopus, Pub Med, Medline, Science Citation Index. During the last 5 years there has been a significant shift in the number and quality of works and citation (almost triple increase of published papers). According to the latest information for 2010 (from January 2011) 3302 scientific works were published, in comparison with 2958 works published in 2009, according to a year old statistics.

- e) **how are the institutions promoting RTD innovation in industry organised? Please refer to technology centres, Community Innovation Relay Centres, science and research parks, technology transfer agencies, etc.**

The Technology Transfer Centre was established at the University of Belgrade, as the part of national IPA project under the name “Support to Establishment of Centre of Education and Information at the Intellectual Property Office of the Republic of Serbia”. The project is financed by European Union and implemented by European Patent Office.

The Business Technology Incubator of Technical Faculties of the University of Belgrade (as the organization for infrastructural support to innovative activities) and its educational centre promote and upgrade technological innovations through education, training programmes, permanent consulting and mentoring programmes for the graduates and students of the final years of studies on technical faculties for initiating their own business. It also provides assistance to the small newly founded innovative enterprises to overcome their first stage development difficulties and to successfully develop their business assisted by Incubator.

Incubator: Korrak” – Rakovica, Belgrade, activities directed towards support of small and medium enterprises development in *Spin Off* phase.

“IHIS” Science and Research Park with its members transfer technology to economy through innovation projects financed from the budget.

Technology Parks are also active in Subotica and Zrenjanin, as well as the Innovation Centre (NOSIC) within the University in Novi Sad The contract is signed for construction of Science and Technology Park in Novi Sad



**9. How is it decided which scientific themes or areas will be funded? How are the scientific priorities being established? Do you have sectoral priorities? To what extent are priorities set at EU being taken into account?**

Within the domain of basic research and technological development, researchers have the possibility to run projects in all science disciplines and the selection of projects is done exclusively on the basis of pre-defined criteria that determine projects quality (research team evaluation, domestic and foreign review and evaluation of qualitative parameters by the Expert Committee for Science and Expert Council).

In the Co-financing Integral and Interdisciplinary Research Programme, researchers are invited to run projects within seven national priorities in science domain as a response to topics laid down in the Research Cycle Programme 2011-2014. Scientific priorities are laid down in the Strategy on the basis of the following criteria:

- possibility of successful participation in the Lisbon strategy and scientific priorities of the European Union
- number and qualities of the existing staff, in the country and Diaspora
- budget investment amount in the last seven years
- success of previous research
- necessary future investments for achieving critical mass and relevance
- possibility of application in economy, in the country and abroad
- existing and potential international cooperation
- contribution to successful conduct of public policies on domestic and international level

The themes within the scientific priorities are compatible with the sectoral strategies of the Republic of Serbia in domains that have existing strategies, while thematic priorities within the EU FP7 were discussed in all areas. The themes within the Research Cycle Programme 2011-2014 are the following:

1) Biomedicine

- 1.1) Cellular and molecular basis of physiological processes and pathogenic mechanisms initiated by the effects of endogenous and exogenous etiological factors;
- 1.2) Pre-clinical and clinical researches that contribute, in an original and innovative way, to prediction, prevention, diagnostic and therapy approaches;
- 1.3) Pharmacogenomics, regulatory mechanisms and pharmacological modulations.

2) Energy and energy efficiency

- 2.1) Energy efficiency of production, distribution and use of energy, with emphasis on increase and sustainability of energy efficiency of buildings;
  - 2.2) New technologies for using renewable energy sources and clean technology with zero emission, primarily within small hydro power plants, cogeneration, biomass;
  - 2.3) Smart electrical networks;
  - 2.4) Thermal power plants and power plants without air pollution.
- 3) Environment protection and countering climate changes
- 3.1) Influence of climate changes on natural resources and environment protection - monitoring influence, adaptation and mitigation;
  - 3.2) Integrated management in the area of environment protection (water, air and soil quality), protection of biodiversity and scientific monitoring of ecosystem;
  - 3.3) New technologies for environment protection.
- 4) Information and communication technologies
- 4.1) Electronic communication networks and services;
  - 4.2) Installed electronic systems;
  - 4.3) Management and control of complex distribution systems;
  - 4.4) Intelligent systems;
  - 4.5) Security and reliability of networks, systems and data.
- 5) New materials and nanosciences
- 5.1) Synthesis and examination of properties of nanostructural functional materials and their application;
  - 5.2) Technologies based on nanostructural materials, and technologies for production and control of nanostructures;
  - 5.3) New technologies for sustainable and efficient production of materials with additional function based on raw materials and domestic industrial facilities;
  - 5.4) Designing and modelling properties of nanomaterials and nanotechnology;
  - 5.5) Toxicity and risk in application of nanomaterials and nanotechnology;
  - 5.6) Contemporary intercalative materials for lithium batteries.
- 6) Agriculture and food
- 6.1) Contemporary biotechnology in breeding;
  - 6.2) New biotechnological approaches and alternative measures for the purpose of promoting competitiveness, quality and food safety;
  - 6.3) Contemporary technologies for producing new and traditional products.
- 7) Improvement of the state decision making processes and affirmation of national identity
- 7.1) European integrations and social and economic changes;
  - 7.2) New technologies and social changes;

- 7.3) Globalisation and international relations;
- 7.4) Social and political transformations in Serbia and the region of the West Balkans;
- 7.5) Quality and accessibility of education;
- 7.6) Effects of demographic structure on public policies;
- 7.7) Cultural and national identity: material and spiritual heritage, producing capital works.

When establishing of scientific priorities and themes for financing, it is taken into account the opinion of the National Council, Expert Committees for Science and Expert boards.

**10. Do the rules of participation in the TFEU Framework Programmes have any impact on the design of the national competitive funding instruments targeting research institutions?**

The rules of participation in the Framework Programmes have impact on the design of the national competitive funding instruments, and are partially included in the National call for projects which was published in 2010.

**11. How is the evaluation of state funded research done conducted? How are evaluators selected? Is peer review applied? Are international evaluators used for peer review?**

Programme and scientific fields funded by the State are defined by the The Act of selection, evaluation and financing of programmes of basic researches, programme of research in the area of technological development and programme of co-financing integral and interdisciplinary researches and programme of provision and maintenance of scientific research equipment.

The programmes covered by the aforementioned Act are financed on the project bases, including financing of scientific and research work of the researchers and financing of direct material expenses of research, in line with the Law on Scientific and Research Activities.

The process of selection of the projects is implemented through the following activities:

- initiation, preparation and announcement of competition;
- receipt and processing of applications;
- evaluation of applied projects – nominating of domestic and foreign evaluators;
- ranking of proposed projects based on the received evaluations, researcher's competency, evaluation of the Scientific Board;
- evaluation of the researcher's competency and estimate of project according to the previously established criteria, using international data bases.

The total project score includes the researcher's achieved results in the last five years, projects reviews (domestic and foreign), evaluations of scientific boards based on the qualitative criteria and participants in funding. The Minister decides on the final rank order of the projects financing for each programme covered by the Act.

The projects financed only from the budget of the Provincial Secretariat are evaluated by the Expert Councils of the Provincial Secretariat for Science and Technological Development, international evaluators are also involved.

**12. Is the use of public funding being monitored: do you have data/statistics?**

The use of public resources related to the project of technological development and innovation activity is strictly monitored and statistically processed.

**13. Is the use of state funding and implementation of grants being controlled and if so, how?**

The budget funds granted for the projects defined by the Law on Scientific and Research Activities are monitored through the annual/semi-annual financial statements, and after that decision on continuation or termination of financing of the project is made.

The Ministry monitors realization of project and performs the following:

- 1) Contracts and monitors researches by which the project is realized, analysis quality of the achieved results, controls intended use of funds, promotes and popularises successfully achieved results and monitors their implementation;
- 2) Makes and enforces decision on termination and further financing of project, in line with the Act on selection, evaluation and financing of programmes of basic researches, programme of research in the field of technological development and programme of co-financing integral and interdisciplinary researches and programme of provision and maintenance of scientific research equipment and science and research facilities, as well as the contracts between the Ministry and researcher.

The Ministry supervises the intended use of funds and discontinues payment or terminates the contract if it has established the non-intended use of the budget funds or any other breach of the contracted obligations. The budget funds are also controlled by the state auditor who gives suggestions for correction of possible errors.

**II. Framework programmes**

**A. TFEU Framework Programmes**

**14. How is the promotion of research cooperation under the EU research framework programme(s) done: by the Ministry? Which department? Is the promotion activity, or part thereof, being outsourced to Promotion office or Agency?**

The Sector for International Cooperation and European Integration, within the Ministry, is responsible for promoting activities within the European Commission Framework Programme. The promoting is done by organising general info days,

theme info days, and by visiting individual institutions and organising info sessions, or by organising consultative sessions in the Ministry at the request of an individual institution. This promotion concerns primarily research community, but also economy, i.e. small and medium-sized enterprises. Within the Sector, the Network of National Contact Persons for different theme areas of the FP7 was formed firstly. After that, the Consultative Bureau for International Projects (March 2008) was founded with the aim to enhance quality of project applications by organising trainings and workshops for writing project proposals. The partners of the Ministry in promotional activities are the Universities, i.e. faculties and institutes, national and regional chambers of commerce, agencies, Provincial Secretariat and other institutions.

**15. How often are Information Days organised and at which level?**

Info days are organised according to the thematic priorities after opening a call in the given thematic priority, at the level of University and the research institutions, National Contact Persons and Consultative Bureau associates. Info days and consultation frequency is several times a month. In addition to this, the Ministry, through the Consultative Bureau, trains young researchers for preparation and writing of project proposals.

**16. Do you have special measures to encourage research cooperation with the EU partners?**

Within special support measures for research cooperation, the Ministry approves financial resources for co-financing trips to consortium meetings during the phase of writing project proposals. In addition, the Ministry allocates special incentives intended for institutions and researches that are engaged as participants/coordinators of the European Union FP7. Besides, the Ministry also co-finances researchers' attendance at the international conferences, and organization of international conference in Serbia. In addition, the Provincial Secretariat has additional measures of support for the researchers in Vojvodina in order to enhance international cooperation.

**17. What is the structure of the National Contact points and their relation with the Ministry?**

The Network of National Contact Persons was established in the Ministry in 2003, and it was structured in 2008 and 2009. At present, the Network consists of 17 persons that are, apart from the Ministry, employed with research institutes, faculties, Serbian Chamber of Commerce, private sector, and other line Ministries (e.g. the Ministry of Telecommunications and Information Society). Their work is coordinated by the national coordinator from the Ministry. Apart from the aforementioned, national contact persons are, pursuant to the policy of the Ministry, also appointed as delegates in Programme Committees for scientific fields of the EU FP7.

**18. Explain your legislation regarding taxation and import duties concerning EU funding for research and innovation.**

Pursuant to the Decree on Declaration of the Law on Ratification of General Framework Agreement between the Federal Republic of Yugoslavia and the European

Union that entered into force on 8 April 2003 (*Official Journal of Serbia and Montenegro - International Treaties*, No. 2/2003), the Ministry enabled tax exemptions for all researchers that participate in projects implemented by the European Union, more precisely, exemption from paying taxes for trade of goods and services.

**B. EURATOM Framework Programme**

**Nuclear research is understood to mean research falling under the scope of the Euratom Treaty (i.e. essentially limited to applied research in fission and fusion energy systems, management of radioactive research and radiation protection).**

**19. Is Serbia engaged, or planning to be engaged, in nuclear research and how is it organised at national level: which Ministry is responsible for nuclear research?**

The Ministry is competent for research in the area of application of nuclear technologies for peaceful purposes. As for other areas of research, the research in this area is project financed, through basic science projects or technological development projects, on the basis of a public tender.

**20. Does Serbia have any specific programmes and/or research institutes for nuclear research?**

In mid-2009, governing of the nuclear research facilities was entrusted to Public Undertaking Nuclear Objects of Serbia, pursuant to the Law on Protection against Ionizing Radiation and Nuclear Safety (*Official Gazette of RS*, No. 36/09). The realisation of the VIND Programme is under way. This Programme includes: decommissioning of research reactor RA, repatriation of spent nuclear fuel, as well as the reconstruction of storage facilities and treatment of radioactive waste. The research in the area of application of nuclear technologies for peaceful purposes is conducted in research institutions, e.g. the Nuclear Science Institute VINCA, Physics Institute in Belgrade and Physics Department of the University in Novi Sad.

**21. Has Serbia already participated in research projects under the Euratom FP?**

Although there were several project applications, mostly in the area of monitoring and environmental protection, the researchers from Serbia did not participate in this research, given that Serbia has not acceded to the Euroatom FP.

**III. Policy initiatives contributing to the European Research Area and Innovation Union?**

**Investing in research**

**22. Please provide quantitative information for the period 2005-2010, at least on the following aspects:**

- a) gross domestic expenditure on RTD – ratio to gross domestic product (GDP);

There are no precisely expressed information.

**b) gross government expenditure on RTD – ratio to GDP;**

The Ministry' budget funds, in absolute amounts, were :

- RSD 1,662,100,000.00 (EUR 27,939,149.44) (0.22% GDP) in 2001
- RSD 2,602,414,000.00 (EUR 42,305,218.87) (0.26% GDP) in 2002
- RSD 3,931,980,000.00 (EUR 57,558,382.09) (0.35% GDP) in 2003
- RSD 4,128,045,000.00 (EUR 52,329,910.63) (0.30% GDP) in 2004
- RSD 4,643,121,000.00 (EUR 54,305,508.77) (0.27% GDP) in 2005
- RSD 7,558,310,000.00 (EUR 95,674,810.13) (0.29% GDP) in 2006
- RSD 8,301,706,577.00 (EUR 104,771,639.44) (0.36% GDP) in 2007
- RSD 8,603,178,000.00 (EUR 97,100,235.89) (0.32% GDP) in 2008
- RSD 8,299,086,000.00 (EUR 86,549,065.17) (0.29% GDP) in 2009
- RSD 9,048,317,000.00 (EUR 85,767,501.25) (0.30% GDP) in 2010

Additional resources for science in the budget of the AP Vojvodina for scientific-technological development, in absolute amounts, were:

- RSD 129,286,197.58 (EUR 1,512,190 ,27) in 2005,
- RSD 379, 425, 989.44 ( EUR 4,802,860.63) in 2006,
- RSD 1, 389, 976, 531.82 (EUR 17,543,563.45) in 2007,
- RSD 1, 120, 570, 368.46 (EUR 12,648,948.74) in 2008,
- RSD 650, 677, 427.46 (EUR 6,785,665.11) in 2009, and
- RSD 802, 827, 775.00 (EUR 7,609,741.94) in 2010.

**c) gross higher education expenditure on RTD – ratio to GDP;**

There are no precisely expressed information.

**d) gross business enterprise expenditure on RTD – ratio to GDP, ratio to gross government expenditure;**

Scientific institutes generate revenues through cooperation with the economy. In 2008 the institutes' gross income, apart from the budget of the MSTD, was circa 12.5 billion dinars (EUR 156,724,680.00). Higher education institutions, at the same time, have generated circa 12 billion of their own income (EUR 150,455,693.00).

**e) gross foreign investment in RTD.**

In the Republic of Serbia, gross foreign investments within international scientific and research programmes opened for researchers from Serbia are over 30 million EUR.

- 23. Describe the strategy to contribute to the Lisbon and Barcelona objectives with respect to investing in research: is there an Action Plan on investment in research aiming at increasing the investment?**

The Strategy foresees increase in allocation of budget funds for science and technological development in the next five years with the yearly rate of 0,15% of GDP. In this way, budgetary allocation in 2015 will be 1,05%. Preparation of Action Plan for implementation of Strategy is underway.

**24. How will the Plan be implemented and monitored?**

The Plan will be implemented and controlled by the Ministry and its working bodies, and by the National Council for Science and Technological Development of the Republic of Serbia. The members of the National Council are also representatives of the economy.

**25. Are research institutes, universities and industry cooperating? Do you have public-private partnerships? Do you have science parks?**

Scientific and research organisation (institutes and faculties) cooperate with the industry and private small and medium-sized enterprises. The cooperation proceeds through joint realisation of innovation projects and projects from the field of technological development financed by the Ministry.

Cooperation between private and public sector exists through ownership structure of commercial entities and through cooperation in joint projects.

Two science and technology parks have been registered in the Ministry to date. The realisation of the construction project for science and technology parks in Belgrade, Novi Sad, Nis and Kragujevac is under way. The aforementioned construction is financed within broader credit agreement that is signed with the European Investment Bank, and it concerns construction and development of scientific infrastructure in the Republic of Serbia.

**26. What are the financial or other incentives to stimulate investment in research at both the state/public level and industry/private level?**

The Strategy lays down the following incentives:

- reduction of taxation for the amount the enterprises invest in projects that engage scientific and research organisations, and which are co-financed with budget resources;
- support to employment of young researchers registered in the projects of the MSTD in private sector;
- if an enterprise enrols an employee in PhD studies, half of the costs of the tuition fee will be financed from the budget resources;
- a support for young researchers registered in the MSTD that establish their own enterprise;



- the costs of filing patents and other forms of intellectual property protection in the Intellectual Property Office in all the projects of the MSTD would be borne by the MSTD

**27. What is the effectiveness of these incentives?**

The first results of the incentives are expected in the coming period.

**Human Capital building and Mobility of researchers**

**28. Please indicate what the percentage of science personnel is compared to the overall workforce.**

According to the data of the Statistical Office of the Republic of Serbia, Statistical Yearbook of Serbia 2010, the number of employees in research and development, in 2009, was 11,534 and the total number of employed persons in Serbia was 1,889,085. According to aforementioned data, scientific personnel comprise 0.611% of the overall workforce.

Based on the "Competitiveness of AP Vojvodina as a European Region" from the year 2009 the number of employees in research and development, for every 100 actively employed citizens in the AP Vojvodina, is 0.274.

**29. Please provide quantitative information for the period 2005-2010, at least on the following aspects:**

**- personnel (public/private RTD);**

**Table 2. The number of enrolled students and graduates in the Republic of Serbia**

**Table 1. Number and type of organisation, employed scientific personnel and researchers according to gender, percentage of overall number of employed**

Year	Number and type of scientific and research organisations				Full-time employees						
	total	instit utes	facult ies	resear ch units	total		scientific personnel, researchers		expert assistants		% of scientific personnel/r esearchers in relation to the total number of employees
					total	female	total	female	total	femal e	
the Republic of Serbia											
2005	163	55	77	31	22,641	11,650	11,551	5,050	4,894	2,664	51
2006	163	57	76	30	22,707	11,692	12,079	5,405	4,756	2,633	53
2007 <sup>1</sup>	149	52	70	25	18,153	9,507	10,580	4,975	2,408	1,487	58
2008	232	67	82	77	19,321	900	10,154	5,439	2,327	1,251	60

In 2007 the new methodology was applied, which was harmonised with international standards

**- tertiary education related to RTD: number of graduates, field, undergraduate/post-graduate.**

The number of enrolled students and graduates in the Republic of Serbia is shown in Table 2, for the period 2005-2008.

year	Number of enrolled students		Number of graduates		% of those graduated on time
	total	female	total	female	
2005	229355	127034	27537	16523	19.77
2006	238710	131988	29406	17702	21.69
2007 <sup>1)</sup>	237598	131612	34671	21097	31.21
2008	235940	130334	40330	24512	-

**Table 3. Graduates according to the education field in 2008 in the Republic of Serbia**

	total		education	Arts and Humanities	Social Sciences, Business and Law	Sciences, Mathematics and IT	Techniques, Production and Construction	Agriculture and Veterinary Medicine	Health Care and Social Protection	Services
	total	female								
<b>THE REPUBLIC OF SERBIA</b>	<b>40330</b>	<b>24512</b>	<b>4598</b>	<b>3446</b>	<b>16778</b>	<b>2839</b>	<b>5752</b>	<b>1121</b>	<b>3310</b>	<b>2486</b>
State Universities	15325	9745	1635	2270	4355	1356	3013	481	1695	520
Private Universities	2654	1500	5	202	2254	223				

**Table 4. Students that have finished postgraduate studies, according to academic qualification**

	total		education	Arts and Humanities	Social Sciences, Business and Law	Sciences, Mathematics and IT	Techniques, Production and Construction	Agriculture and Veterinary Medicine	Health Care and Social Protection	Services
	total	women								
Republic of Serbia total	40330	24512	4598	3446	16778	2839	5752	1121	3310	2486
High schools	14854	8781	2226	355	6575	755	1746	216	1237	1719
Total universities	25476	15731	2372	3091	10203	2084	4006	905	2073	767
Total state universities	20775	13172	2367	2889	6133	1771	4006	845	2033	731
state universities central Serbia	15325	9745	1635	2270	4355	1356	3013	481	1695	520
state universities AP Vovodina	5450	3427	732	619	1778	415	993	364	338	211
Private universities	4701	2559	5	202	4070	313	-	60	40	36
private universities central Serbia	2654	1500	5	202	2254	223	-	60	40	36
private universities AP Vovodina	2047	1059	-	-	1816	95		60	40	36

**30. How do you ensure human resources capacity? Which actions is your country taking to ensure that there are sufficient qualified researchers?**

Professional specialisation of the science and research personnel is realised through programmes of the Ministry that are defined in the Law on Scientific Research Activities (OG of RS, No. 110/2005, 50/2006-corr. and 18/2010) for participation of researchers in science gatherings (symposiums, conferences and congresses) abroad and in the country, for short study trips abroad and financing post-doctoral specialisation. Two basic

programmes are realised pursuant to the Law: the Support Programme for Specialisation of Science Personnel and the Support Program for Publishing Scientific Publications and Acquisition of Scientific Literature.

The Support Programme for Specialisation of Science Personnel is comprised of five projects that include financial support: organising scientific conferences in the country and publishing collection of works from the conference, participation of our science personnel at international scientific conferences abroad, sojourn of foreign science personnel on call in scientific institutions in the country, co-financing membership of scientific institutions in international scientific associations and participation of our representatives at working sessions in international scientific organisations.

The other programme includes financial support for researchers in publishing domestic science magazines and monographs in which the results of scientific research are published. The Ministry finances purchase of foreign magazines and books, in electronic or paper form, and the maintenance and development of domestic electronic base with bibliometric analysis on magazines through the contract with the National Library of Serbia (KoBSON). This approach enables researchers to access a great number of scientific magazines and other scientific publications of the most important worldwide publishers.

In addition to these programmes, the projects of post-doctoral financing of young scientists are also important. The Ministry each year allocates 20 scholarships to young doctors of science for six months sojourn in prestigious global scientific institutions.

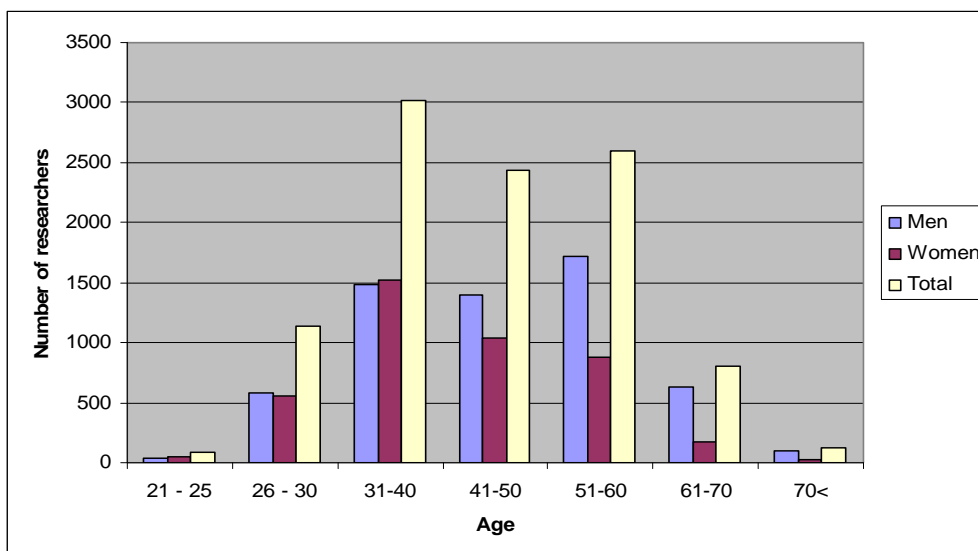
Co-financing of Doctoral and Master studies. Special scholarships are allocated for the scarce fields studies. The 80 working places for the young researchers and 11 for the returning researchers have been co-finance. The 98 apartments for the young researchers have been constructed.

### **31. Are there any special actions for science and women?**

Participation of women in scientific research in the Republic of Serbia is high, so there was no need to undertake special measures to increase their participation in the last years.

Of the total number of researchers, 47% are women, which makes scientists' gender structure positive and above average value in European countries. The number of women researchers grows each year and similar trend is present in the neighbouring countries. The greater number of women researchers is present in scientific disciplines of basic research, while in the area of technological development women comprise circa 50% of the total number of researchers.

Figure1. The number of researchers according to gender and age



Source: the Ministry

This year, the national tender “For Women in Science” was launched in Serbia for the first time, and more than 140 young women scientists from Serbia participated. Two scholarships, each having an amount of €5,000, have been awarded. The programme “For Women in Science” exists since 1998, when the “L’Oreal” company and UNESCO achieved cooperation and organised awards in the area of natural sciences on the international level. The aim of the programme is to support young women in further scientific and professional specialisation.

In AP Vojvodina, Two international scientific conferences have been organised exclusively for this population.

-The 14<sup>th</sup> General Meeting of EWM (European Women in Mathematics), Novi Sad, August 25-28, 2009, Faculty of Science and Mathematics, Novi Sad  
 - Women and Decision Making, Assembly of AP Vojvodina, 18 June 2010

### 32. Is an Action Plan in place to increase the number of scientists in the country?

One of the goals of the Strategy of Scientific and Technological Development of Serbia for 2010 - 2015 is increasing the number of scientists. Drawing up the Action Plan of the Strategy is under way and it will precisely lay down specific projects focused on increasing the number of researchers. Pursuant to the Strategy, the tender for new project cycle 2011-2014 was announced. In the previous project cycle, the Ministry funded 8890 researchers, while for the project cycle 2011-2014 the number of researchers who fulfilled the criteria for financing is much bigger, 11300. Also, 1700 young researchers, PhD students, will be engaged in the projects of the new project cycle.

### 33. What measures are in place to attract young people to science studies?

The Ministry implements programmes and projects within the programmes, which encourage young and talented for science, and in this way provides young scientists.

The programme of project co-financing of PhD studies offers support to young and

talented on PhD studies for scientific and research work. The programme includes scholarships for over six hundred students of PhD studies and it is realised continuously for years. In addition to scholarships, the programme provides conditions for their work on projects, i.e. introduction to the process of scientific and research work during scholarship by providing resources for compensation of material costs of work on the project. Scholars of the Ministry are, through the programme, provided with other means of support for specialisations, such as: participation in scientific conferences in the country and abroad, study sojourns abroad, additional resources for scientific and research work and support for application, finishing and presentation of PhD thesis.

**How are young researchers funded, with stipends or with employment contracts?**

Scholars of the Ministry and other students of PhD studies are continuously employed as researchers on projects financed by the Ministry. The employment of PhD students on projects depends on their success during the studies (high average mark), scientific area of their interest and recommendation from the mentor and project manager.

The support programme for the young and talented for scientific and research work includes support for young scientists (students and pupils) for participation in scientific conferences in the country and abroad, participation in international knowledge Olympiads and for other forms of specialisation. Each year the Ministry awards a certain number of scholarships for the pupils of the last year of secondary schools that have won one of the medals on international knowledge Olympiads. This programme finances foundations and institutions that award scholarships to the best students, e.g. the Republic Foundation for Young Scientists and Artists or ones that work together in promotion of science, e.g. Petnica Science Centre.

Besides the aforementioned, the Provincial Secretariat co-finances study sojourns of the students at scientific conferences abroad, and one year sojourn of students on Universities abroad according to the project *Campus Europae*. Public tender for co-financing is open every year.

**34. Has Serbia nominated its member in the Steering Group on Mobility and Human resources and is it participating in the meetings?**

The Republic of Serbia has nominated members in the Steering Group on Mobility and Human Resources, two of which are experts from the Ministry and one is expert from the scientific and research community, that participate in the activities of the aforementioned authority.

**35. If there is a problem with regard to brain-drain of researchers and scientists from your country? Are there any data on how many Serbian researchers are abroad and where?**

According to the last census (2002), more than 400,000 citizens of Serbia are in foreign countries worldwide. Over 50% of the emigrants left the country in the period 1991-2002. Over 6% of the total number has Bachelor's Degree (25,254). However, the data from the last census on the number of emigrated highly educated people is

underestimated. The results of the study on the number of immigrants and emigrants in the OECD countries show that out of the total number of Serbian and Montenegrin emigrants, 11.9% are highly educated (Dimon-Lemetra, 2005: 39). The brain-drain continued after 2000. It is estimated that circa 50,000 people emigrated, of which 6,000 are highly educated. The most common emigration destinations of researchers are overseas countries (Canada, USA, Australia), United Kingdom, Germany, France and Switzerland. According to Prof. Grecic, Serbian science Diaspora includes more than 10,000 researchers, which is close to the number of researchers in Serbia. Future trends of science personnel emigration from Serbia will primarily depend on demand of foreign countries for these experts and on the development speed of national economy and science.

**36. What are the government policies to address this matter? Is there a mapping of Serbian *diaspora*? (N.D.)**

In the Strategy of Scientific and Technological development of Serbia for 2010-2015, within the projects that are realised by the resources acquired through financial arrangements with the European Investment Bank, there is a project of return of our scientists from Diaspora. The Strategic document concerning the return of our scientists from abroad has not been drawn up, but more projects focused on solving this problem were realised in the last two years. The Projects are realized by governmental and non-governmental organizations (Group 484, Fund for Political Excellence)

In 2009, the Ministry initiated drawing up of a base of our researchers in Diaspora. To date, circa 660 of our scientists have been registered. The base is located on the Ministry's website and all of our scientist from Diaspora who are interested may register. The great number of our researchers works at prestigious Universities and scientific institutes worldwide. The greatest number of them works in USA, Canada, Germany and United Kingdom.

**37. Are there specific support measures or grants to attract scientists abroad to return to Serbia?**

The Ministry has included the project of the return of our scientists from abroad and their faster inclusion into Serbian science area into the Strategy, within the resources acquired through financial arrangement with the European Investment Bank with the value of 200M€ The proposal of the project includes the following activities: motivating the researchers from Diaspora for scientific research in Serbia; forming the network of Serbian scientists from Diaspora; short sojourn of eminent Serbian scientists from Diaspora in Serbia (including lectures, etc. in scientific and research institutions); attracting scientists from Diaspora to commence start-up enterprises, and other initiatives contributing to cooperation and creativity.

Some of the envisaged project activities are already being realised. In the tender for project cycle 2011-2014, special measures stimulate inclusion of our scientists from Diaspora in national projects (additional number of points according to the number of included foreign scientists). Circa 250 of our researchers from Diaspora have applied for the tender and they will work jointly with the colleagues from scientific institutions in the country in research on proposed projects. Costs of their trip for joint



research will be financed by the Ministry.

One of the supporting measures, the aim of which is solving of problems related to the brain-drain and researchers who are living the country, is programme of construction of non-commercial apartments for young scientists, supported by the Ministry and Provincial Secretariat. So far, the houses are built in Nis, Belgrade and Novi Sad.

In order to prevent negative tendencies that lead to further weakening of necessary personnel potential of the University in Novi Sad, the Provincial Secretariat realised the “400 Young Researchers towards European Integrations” Programme Study, in the period 2005-2009. The basic aim of the programme is employing of young researchers, stopping the drain of young talented people abroad, and creating possibilities for researchers that have, under pressure, quit their jobs and left the country in the past years for insecurity, instability and lack of perspective.

**38. How are training schemes organised (e.g. implementing organisations, target groups, existing programmes)?**

The programmes of continuous promotion of science personnel are laid down in the Law on Scientific Research Activities. The programmes are implemented by the Ministry and are intended for all age structures of the researchers. One of the requirements for acquiring funds of the Ministry for specialisation is met by the researchers that work on projects financed by the Ministry and that are employed in scientific and research organisations. The programmes implemented by the Ministry are intended for all groups of researchers, but pursuant to the Strategy, the focus is on young researchers (students of PhD studies, talented pupils with esteemed results on knowledge Olympiads, etc.). In addition, the Ministry conducts training for researchers in the fields of innovations, business plans preparation, intellectual property protection, and preparation of projects for participation in international tenders.

**39. What kinds of visa procedures do you have for foreign scientists?**

Procedure for residence of foreign scientists, and for other foreigners, is laid down in the Law on Foreigners that is in force from 1 April 2009 (*Official Gazette of the Republic of Serbia* of 23 October 2008, No. 97/2008). This Law lays down conditions for entry, movement and residence of foreigners in the Republic of Serbia.

For all European and many other countries, residence up to 90 days does not require a visa. For the remaining countries it is necessary to get visa for short residence in one of the diplomatic or consular offices of Serbia.

The visa for temporary residence (visa D) is necessary for residence of foreign researches if it lasts more that 90 days. Temporary residence can be approved to a foreigner that plans to reside in the Republic of Serbia longer than 90 days for: 1) work, employment, economic and other professional activities; 2) education, studying or specialisation, scientific and research work, practical training, participation in international exchange programmes for pupils or students, i.e. other scientific and educational activities.

In addition to the request for granting permission for temporary residence for

education, studies or specialisation, scientific or research work, practical training, participation in international exchange programmes for pupils and students, i.e. other scientific and educational activities, a foreigner shall submit proof on validity of a request for temporary residence in accordance with the purpose of temporary residence.

Temporary residence may be extended up to two years upon the expiration of the period laid down for the duration of education, studying, specialisation or practical training.

## **Science in society**

### **40. Is the science in society dimension of the government-led research policy given any administrative existence and resources, such as being assigned to the responsibility of a specific ministerial department?**

The society dimension of research policy is the authority of Centre for Promotion of Science and, pursuant to the Law on Scientific and Research Activities (Official Gazette of RS, No. 110/2005, 50/2006-corr. and 18/2010), the Centre for Promotion of Science has been established for promotion and popularisation of science and technology, scientific and technological results and achievements in the country and worldwide (Article 27a).

The Centre is part of a comprehensive effort of the Government of the Republic of Serbia, especially the Ministry, to provide sustainable development, prosperity and economic growth in the country and to bring science closer to the wide population.

### **41. How do you ensure that decision-making is scientifically-based?**

The decisions are made in line with the Law on Scientific Research Activities and the Law on Innovations, and respective by-laws, which precisely define scientific and research programmes and methods of their realisation.

The National council for science and technological development, working groups of the Ministry and of the Provincial Secretariat have advisory role.

### **42. Are specific actions considered in your country to raise awareness and improve the understanding of science in society?**

Pursuant to the Law on Scientific Research Activities (OG of RS, No. 110/2005, 50/2006-corr. and 18/2010), the Centre for Promotion of Science has been established, the basic competence of which is promotion and popularisation of science in the country.

The Measures applied by the Ministry through the Programme of science promotion and popularisation are:

- support of scientific and research organizations and scientific societies activities ;

- support to organization of Science Festival in Belgrade, Novi Sad and Nis;
- printing of publications
- promotion of science in primary and secondary schools;
- support to the museum of science and technique;
- promotion of science through media (electronic and printed).

**43. Are their laws or rules relating to the ethical aspects of engaging in and public funding research, in particular in sensitive areas as life sciences, health research, nanotechnology or information technologies?**

A Working Group has been formed within the Ministry to cooperate with the Animal Welfare Ethic Council (hereinafter referred to as: Working Group).

The Working Group tasks are:

- to monitor compliance of the scientific and research projects which use experimental animals with the Law on Animal Welfare and Regulations of Animal Welfare of the Republic of Serbia and EU Directive;
- to cooperate with Animal Welfare Ethic Council and ethic commissions organized within the institutes and faculties which in experimental work within the science and research projects use experimental animals;
- to prepare and submit to the Animal Welfare Ethic Council the List of institutes and faculties which in the science and research projects financed by the Ministry use experimental animals;
- to prepare and submit to the Animal Welfare Ethic Council the List of proposed scientific and research projects financed by the Ministry in which the experimental animals are used, for the purpose of issuing the licence for conducting such experiments;
- to give advices and expert opinions about conducting the animal experiments within the scientific and research projects;
- to carry out other activities falling under animal experimental work, for the needs and at request of the Ministry and the Animal Welfare Ethic Council;

**44. How is it ensured that ethical standards are respected?**

Pursuant to the Article 72 of the Constitution of the Republic of Serbia, the autonomy of Universities, higher education and scientific institutions is guaranteed. Universities, higher education and scientific institutions autonomously decide on their organisation and work, pursuant to legislation. Article 73, of the Constitution of the RS, guarantees the freedom of scientific and artistic creativity. "Scientific and artistic creativity shall be unrestricted. Authors of scientific and artistic works shall be guaranteed moral and material rights in accordance with the law. The Republic of Serbia shall assist and promote development of science, culture and art."

Article 5, of the Law on Scientific Research Activities (*Official Gazette of RS*, No. 100/05) defines principles of scientific research activities: 1. freedom and autonomy of scientific research work; 2. publicity of scientific research work and results thereof; 3. scientific and professional criticism; 4. competitiveness of scientific programmes and projects; 5. scientific research work ethics, in accordance with principles of good scientific practice and responsibility of scientists for consequences of their work; 6. connection with the higher education system; 7. international scientific and technological cooperation; 8. concern for sustainable development and environmental protection.

The aforementioned Law in Article 7 defines scientific freedoms: scientific work is free and is not subjected of any limitations, except for those arising from observing of scientific standards and ethical principles in scientific research work, protection of human rights, and environmental protection as well. Scientific work shall be subjected to scientific criticism.

The freedom of scientific work and creativity are reflected in the freedom to conduct science, freedom to choose scientifically recognised research methods, freedom to publish and present scientific results, and also in the freedom to select methods for interpretation of scientific research achievements.

From the Strategy: amendments of the Law on Innovation Activities lay down regulation of intellectual property rights protection, under the joint projects between corporate sector and SROs, and partly financed by MSTD, that is the investment fund in the majority state ownership. If the decision is made to change legal form of the Fund into the joint stock company, during the sale of shares, the share of the state capital in the Fund capital must be at least 51%. The provisions on the intellectual property rights shall be fully harmonized with the international practice according to which the owner of so created intellectual property is the employer or the client who contracted the work. Pursuant to the Law on Innovation Activities the MSTD issues the document prescribing publicity and confidentiality of information relative to the realization of the innovation project, and how mutual relations are regulated among the project participants, in terms of intellectual property rights and respective financial compensation in case of commercialization of an intellectual right. Considerable part of income would go to the innovators (not less than 50%).

#### **45. Do you have an Action Plan on Science in Society?**

The aims of the Action Plan for Strategy implementation which is underway are as follows:

- target-oriented defined and applicable scientific and research programmes;
- research results implementation;
- higher education upgrading;
- improved efficiency of allocations and use of all scientific and research and development resources;
- more efficient distribution of science funds;
- upgrading and implementation of technology as result of own development;
- developed national innovation system which provide international competitiveness of Serbian economy;
- development of small and medium enterprises based on initiatives.

Newly established Centre for Promotion of Science prepares the Proposal for Promotion of Science, Scientific and Technological Results and Achievements pursuant to the provisions of the Law on Scientific Research Activities (OG of RS, No. 110/2005, 50/2006-corr. and 18/2010). After being adopted by the Management Board of the Centre, it will be submitted to the Government of the Republic of Serbia for the final adoption.

The proposal of the program for promotion of science, scientific and technological results and achievements will be based on modern concepts for promotion of science. Aiming to overview the latest paradigm in this area, the Centre initiated cooperation with centres in France, Belgium, Switzerland, the United States of America, the Netherlands, United Kingdom and numerous other countries. The programme will be a support for the implementation of the Strategy of Science and Technology Development of the Republic of Serbia for the period 2010-2015, which emphasises creation of national innovation system.

The Action Plan of the activities of the Centre for Promotion of Science lays down the informing of the public with the concept of interactive centre where citizens get acquainted with basic natural phenomena and the latest scientific and technological achievements, because this type of science centre will be introduced in Serbia for the first time. The new building of the Centre will be opened in 2012, as a part of the Campus of Science and Art, in Block 39 in Novi Beograd. In addition to the Centre, the Campus will host scientific institutes, Nano laboratories, Supercomputer Centre, numerous shared facilities, buildings of the University and faculties.

## **Infrastructure**

### **46. Is there a mapping of the leading scientific institutes and infrastructures in the country?**

The leading scientific institutes in country and their infrastructure are designated. Also, building is planned of new user services (shared user resources) as separate legal entities the only purpose of which will be offering of infrastructural support to the scientific community.

### **47. Are Serbian research institutes and infrastructures linked to other institutes and infrastructures in the Region and/or to the infrastructures in the EU Member States?**

The Serbian research institutes are linked to the regional and EU ones through bilateral and multilateral (FP6 and FP7) programmes, but, still there is no programme of infrastructural linking. The 400 million investment programme is planned for investment in scientific infrastructure.

### **48. Are Serbian research institutes and infrastructures open to non-Serbian scientists? What are the access conditions?**

The existing infrastructure is available to scientists outside Serbia under the same conditions as for the scientists from Serbia if the foreign scientists are part of the project team or consortium that implements the project.

**49. Is there a national roadmap to strengthen the research capacity?**

The Government of the Republic of Serbia has adopted the Strategy of Scientific and Technology Development for the period 2011-2015 the aim of which is to strengthen research capacities. The state has provided 400 million euros for investment into scientific infrastructure in that period

**50. Has Serbia nominated its delegate in ESFRI and is he/she participating in the meetings?**

Serbia has nominated delegate in ESFRI that participates in the meetings.

**Organisation of research on specific areas**

**51. Is your country having special research programmes and funding on coal and steel?**

No, there are no special programmes.

**52. Does your country have special measures to engage in research on Food, Agriculture and Biotechnologies and measures to ensure the proper use of biotechnologies? Is there an Action Plan on biotechnology?**

The use of GMO is laid down in the Law on Genetically Modified Organisms (*Official Gazette of the Republic of Serbia*, No. 41/2009, in force since 10 June 2009) and Law on Food Safety (*Official Gazette of RS*, No. 41/2009) that lays down general rules of food safety, conditions for placing on the market food and animal food, obligations and responsibilities of entities in food and animal food activities, system of fast notifications and alerts, urgent measures and managing crisis, hygiene and quality of food and animal food. These procedures have been elaborated in more detail in chapter 12, answers to the questions 33 and 34

**53. What are the policies, programmes and budgets in the field of the conversion of military RTD?**

Strategic guidelines of scientific and technological development in the Ministry of Defence and Serbian Armed Forces from 2009 until 2019 define policy that is concerned with conversion of military research and technological development. This Strategy envisages implementation of scientific and technological development policy with double purpose, from military to civil, and from civil to military development. Accreditation of some of the military scientific and military educational institutions by the Ministry created conditions for application of projects from the Ministry of Defence within the Research Programme in the Area of Technological Development for the period 2011-2014. These projects, financed by the Ministry, represent scientific and technological development, where, in addition to military, civil purpose is also envisaged and they refer to the following areas: microelectronics, new materials, aviation and information technologies.

- 54. Does your country have, or are you planning, targeted actions or special programmes to foster competitiveness via industrial research on specific topics such as on clean sky? Innovative medicines? Energy efficiency? Ageing? Are there existing examples of public-private partnerships in the field of research in your country?**

The actions by special themes are planned to be initiated through the activities of the National Competition Council within the Ministry. There are examples of public-private partnership within the Programme of technological development.

- 55. Does your country have any special interest in participating in Article 185 initiatives or the Joint Technology Initiatives currently being implemented at EU level?**

In June 2002, Serbia acquired the status of a full member of the Eureka Initiative. Since then, coordination of the Eureka activities was assigned to the Ministry. In the Eurostars Programme, Serbia expressed readiness to participate in the status of interest.

#### **International S&T cooperation**

- 56. Do you have a strategy for international S&T cooperation (either self-standing or embedded into a general S&T/globalisation strategy)? If yes, describe the main pillars of that strategy (e.g. how do you decide on what kind of research to do and with whom?) Which thematic and geographic priorities do you have in international S&T cooperation?**

Thematic priorities of international cooperation are equal to the national, scientific priorities, defined in the Strategy. Within the Strategy of Scientific and Technology Development of the Republic of Serbia for the period 2010-2015, which was adopted on 25 February 2010 in the Government of the Republic of Serbia, the primary research field are defined:

- biomedicine,
- new materials and nanoscience,
- environment protection and countering climate changes,
- energy and energy efficiency,
- agriculture and food,
- information and communication technologies,
- improvement of decision making processes and affirmation of national identity.

This strategic document defines international scientific and technological cooperation of our country, whereby the emphasis is on cooperation within the Seventh Framework Programme for research and demonstration activities of the EU, then on cooperation with the Joint Research Centre (JRC) of the European Commission in the areas of joint interest, and also on cooperation in other programmes of international cooperation on multilateral and bilateral level. The Strategy especially emphasises the need of further development of partnership with high technology companies, world

leaders in specific areas, and our scientific Diaspora. The partnership with international organisations for development of statistical methods and indicators for scientific and research work and innovation activities is also envisaged.

**57. What are the main means for supporting/implementing international S&T cooperation (e.g. openness of national research programmes for foreign participants, including funding of foreign participants; specific support instruments; bilateral S&T dialogues/agreements, etc.)?**

Within the new national project cycle 2011-2014, the possibility of participation of foreign researchers on national projects is opened. This type of cooperation was, in the evaluation of the project proposal, especially valued with additional number of points to those teams that included foreign researchers in planned research. On the other hand, resources for the activities of foreign researchers are provided for in project budget.

In addition to this, the Ministry has additional programme of co-financing participation of eminent foreign researchers at scientific meetings held in Serbia.

Serbia has signed bilateral agreement in the area of science and technology with: Slovenia, Croatia, FYR of Macedonia, Slovakia, Italia, Cyprus, Finland, Russia, France, Greece, India, Israel, China, Belarus, Hungary, Germany, Portugal, Switzerland, Spain and USA. Within the multilateral cooperation, Serbia has successfully cooperated with the Central European Initiative, NATO programme - Science for Peace and Security, Organization of the Black Sea Economic Cooperation, SCOPES programme and UNESCO.

Basic types of support of international scientific and technological cooperation by the Ministry and Provincial Secretariat are:

- Support for application of international projects of scientific and research institutions (resources are approved for technical equipment and necessary contacts with partners)
- Support for participation in the consortium meetings for preparation FP7 projects;
- Financial support for the groups which have been assigned FP7 and other international projects
- Co-financing organisation of international scientific meetings.

**Can you list any current international agreements on Science & Technology?**

- Science and Technology Cooperation Agreement between the Government of the Republic of Serbia and the Government of the United States of America, signed in Washington on 23 April 2010;
- Science and Technology Cooperation Agreement between the Government of the Republic of Serbia and the Government of the Republic of Italy, signed in Rome on 21 December 2009;
- Science and Technology Cooperation Agreement between the Government of the



Republic of Serbia and the Government of the People's Republic of China, signed in Beijing on 7 April 2009;

- Programme of joint promotion of participants exchange on projects between the Ministry and the German Academic Exchange Service (DAAD) of the Federal Republic of Germany, signed in 2007;
- Science and Technology Cooperation Agreement between the Ministry of Science and Environment Protection of the Republic of Serbia and the Ministry of Science, Technology and Environment of the Republic of Cuba, signed in Belgrade on 19 October 2006;
- Agreement between the Ministry of Science and Environment Protection of the Republic of Serbia and the National Center for Scientific Research of the Republic of France CNRS (Centre national de la recherche scientifique), signed in Paris on 25 October 2005;
- Agreement between the Council of Ministers of Serbia and Montenegro and Government of Hungary on scientific and technological cooperation of 17 February 2005;
- Memorandum on Initiating Programme of Scientific and Technological Cooperation between the Republic of Serbia and the Republic of Croatia, signed on 5 November 2005, which established "Knowledge for Progress and Stability" Programme of Advanced Actions;
- Science and Technology Cooperation Agreement between the Council of Ministers of Serbia and Montenegro and the Government of the Republic of India, signed in Belgrade on 28 October 2004;
- Technical and Financial Support Agreement between the Federal Republic of Yugoslavia and the Swiss Confederation signed in Belgrade on 23 February 2003;
- "Agreement between Serbia and Montenegro and the Kingdom of Spain on Cooperation in the Areas of Culture, Education and Science", 24 September 2003;
- Treaty on cooperation which established "Pavle Savic" Integrated Activities Programme, i.e. "Hubert Curein Partnership" (PHC) by the Ministry of Science, Technology and Development of the Republic of Serbia (today the Ministry) and the Ministry of Foreign Affairs of the Republic of France, signed on 16 June 2003;
- Science and Technology Cooperation Agreement between the Government of the Federal Republic of Yugoslavia and the Government of the Republic of Slovenia, signed on 31 May 2002;
- Memorandum of Understanding between the Eureka Secretariat and member states of the Eureka Initiative, 28 February 2002;
- Agreement between the Federal Government of the Federal Republic of Yugoslavia and the Government of the Slovak Republic on scientific and technological

cooperation, signed in Bratislava on 26 February 2001;

- Agreement between the Federal Government of the FRY and the Government of the Republic of Belarus, signed in Minsk on 6 March 1996;
- Culture, Education and Science Cooperation Agreement between the Federal Government of the Federal Republic of Yugoslavia and the Government of the State of Israel, signed in 1998;
- Science and Technology Agreement between the Government of the Federal Republic of Yugoslavia and the Government of the Republic of Macedonia, signed on 3 July 1997;
- Agreement between the Federal Government of the FRY and the Government of the Russian Federation on cooperation in the areas of culture, science and sport, signed in Belgrade on 19 July 1995;
- “Long-term Agreement on Economic, Scientific and Technological Cooperation between the Socialist Federal Republic of Yugoslavia and the Republic of Portugal”, 18 October 1977;
- Agreement on Exchange of Scientists and Researchers between the Republic of Greece and the Socialist Federal Republic of Yugoslavia, signed in Belgrade on 17 April 1976;
- Agreement on cooperation between the Government of the SFRY and the Government of the Republic of Finland in the areas of culture, science and cognate areas, signed in Helsinki on 7 February 1973;
- Convention on Educational, Scientific, Cultural and Technical cooperation with the Republic of Cyprus, signed in 1969.

**58. What kind of multilateral activities do you pursue (including membership in S&T -relevant international institutions)?**

- In December 2010, Serbia started negotiations for gaining ~~gained~~ a status of associate member of the European Organisation for Nuclear Research (*Conseil Européen pour la Recherche Nucléaire – CERN*). In February 2010, Serbia signed Memorandum of Understanding with Joint Research Centre (JRC) of the European Commission, and in December 2010 finalised the Agreement on Cooperation with the Institute for Energy (IE) of the Joint Research Centre; furthermore, during 2009 and 2010, Serbia reactivated its membership in the Joint Institute for Nuclear Research - JIRN in Dubna. In the last several years, Serbia has raised the level of participation in the COST (European Cooperation in Science and Technology) and EUREKA, and became a leader among countries of the Western Balkans in these programmes. Serbia is a member of the Partnership for Advanced Computing in Europe (PRACE) and European Grid Infrastructure (EGI). During 2011, Serbia has the presidency in the Central European Initiative (CEI). Serbia is very active in the Organization of the Black Sea Economic Cooperation (BSEC), SCOPEs Programme (researcher from Serbia are among the most successful in using this competitive programme),

UNESCO programmes, and in NATO science programme “Science for Peace and Security”.

- 59. Have you nominated a delegate observer in the Strategic Framework for International Sciences and Technology Cooperation (SFIC) and do you regularly attend the meetings?**

The delegate observer has been recently nominated. On previous meetings, largely the representative of the permanent mission of the Republic of Serbia in Brussels was present.

#### **IV. Innovation Union**

- 60. What is Serbia doing to stimulate innovation: how is industry stimulated to produce innovative products and services?**

The Ministry adopted the Law on Innovation Activities (Official Gazette of the Republic of Serbia No. 110/2005 and 18/2010) pursuant to which the Fund for Innovation Activities was established. The task of the Fund is to provide funds for stimulating innovations. The Fund performs activities related to financing of preparation, realisation and development of programmes, projects and other activities in this area. The Ministry and the Ministry of Economy and Regional Development finance various programmes of innovation stimulations and stimulate production of innovative products and services.

- 61. Do you have rules on government procurement which stimulates the use of innovative products and services? Do you encourage or offer support for protecting the results of research with IPR?**

There is no special Government programme for stimulating the use of innovative products and services.

The Ministry, through the Law on Innovation Activities Articles 32, 33, 33a, 33b and 33c, defined the rights of ownership, protection and use of intellectual property that is a result of realisation of innovation or development projects co-financed by the Ministry. Article 33, of the Law, lays down that the costs of obtaining and maintaining the right under Article 32, paragraph 2, of this Law, can be co-funded by the Ministry on the basis of a special decision.

Through innovation projects and through financing applications of natural persons innovators, the Ministry finances, in cases where it is required, the costs of protection on intellectual property because this is envisaged through tender requirements and through the budget form submitted with the projects.

- 62. Are there measures to facilitate access to venture capital?**

In order to encourage activities for development of venture capital, the Ministry has established the Fund for Innovation Activities that will finance early stages of new technology development in private sector and encourage participation of venture capital in technology transfer.

In addition to this, the Ministry has initiated forming of regional fund for venture capital (Western Balkan Technology Fund). Within this initiative, the European Investment Fund (EIF) has assessed the need for venture capital in the countries of the Western Balkans. This report proposes measures in accordance with broad guidelines of the European Commission that would ease the access of micro, small and medium-sized enterprises (SME) to financing, with the aim of encouraging innovations, entrepreneurship and economy growth based on knowledge.