Government of Montenegro

Ministry of Education and Science

Questionnaire

Information requested by the European Commission to the Government of Montenegro for the preparation of the Opinion on the application of Montenegro for membership of the European Union

25 Science and research

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I. Research policy

Research activity is one of the most significant elements for development of each state, so changes in accessibility, organizing and financing of research work, as well as comparability with the European Union are imposed on Montenegro as a need and obligation.

Research policy in Montenegro is carried out:

- through inclusion of research institutions and researchers in the European research area and international scientific programmes;
- through realisation of national and international research projects (basic, applied and developmental research);
- within space and with necessary equipment for research realisation;
- through qualifying staff for scientific work and training of researchers;
- through accessibility to results of scientific work in the country and the world and
- through fostering programmes the realisation of which contributes to overall standard increase of citizens and building of knowledge based society.

a) International Cooperation

Priority activity of research policy realisation in Montenegro is inclusion of research institutions and researchers in the European research area and international scientific programmes with the aim of:

- developing and strengthening of national economy;
- improvement of citizens' life standard;
- enabling the work in research centres and institutes for Montenegrin researchers within the EU Member States;
- utilization of high level technologies and modern laboratories;
- knowledge and experience exchange through common research projects, as well as possibility for professional development of young researchers;
- development of research networks and
- setting up of cooperation in order to enhance competitiveness of our researchers and institutions within EU framework programmes and other programmes of international cooperation.

Montenegro has participated in significant segments of the Lisbon Strategy, the basic EU document, such as infrastructural connecting (trans-European networks within transport area, telecommunications and electro-energy system) and knowledge sector (research activity, innovation, education and training).

Montenegro has been actively included within this process aiming to provide reform of research activity, and the entire process has been carried out under monitoring and with support of European programmes for research activity designed for the region of the Western Balkans.

Montenegro is included in the European research area and international scientific programmes, and these are:

i) FP7- Seventh Framework Programme for research and technological development of EU

Memorandum of Understanding between the European Community and Montenegro on association of Montenegro to Seventh Framework Programme of the European Community for research, technological development and experimental activities (2007- 2013) was adopted by the Government of Montenegro on 13 December 2007 in order to provide researchers with the opportunity to apply for calls for proposals for participation in research projects of the largest European science fund, **the Seventh Framework Programme for EU research and technological development (FP7)** and to associate Montenegro to this programme starting from 2008.

Memorandum was signed in Brussels on 25 January 2008.

Decision on treatment of Montenegro as a unique convergence region for needs of participation within FP7, was signed in Brussels in May 2008.

In June 2008, representatives of Montenegro were appointed in Programme Committees of the European Commission for realisation of FP7, namely, eleven professors from the University of Montenegro, as well as National Contact Points.

- **SEE-ERA.NET**

Montenegro is participating in realisation of **SEE-ERA.NET** common project of networking of research institutions of 14 Western Balkans countries and EU Member States, which was successfully realized within FP6 project. Research teams from Montenegro are participating in 6 out of 34 projects which have been realised since 2007.

As one of the results of this project the **programme RePSEE** was created (Regional Programme for South-Eastern Europe), designed for enabling further development of research policy and systems of countries from the region, and for support of further common activities of member states. This programme is made of four activity pillars: providing support for joint research projects, support for development of human resources - young scientists, support to innovative activities, as well as accompanying measures to research projects.

- SEE-ERA.NET PLUS

Joint research projects will be financed under the project **SEE-ERA.NET PLUS** which was approved by the European Commission within FP7.

- WBC- INCO.NET

WBC-INCO.NET project is being carried out under the FP7 (1 January 2008- 31 December 2011). It was primarily designed for coordination of research policies of the Western Balkans region with valid policies in the EU, together with partners from EU (project gathers 26 partners). Numerous common activities have been realized so far, some of which we should mention: support to statistics reform for science and technology area in the countries of Western Balkans (workshop in which EUROSTAT, OECD, and UNESCO representatives participated was realised as well as expert visits to the countries of the region); through consultative process, regional research priorities have been defined for the following areas: ICT, agriculture and biotechnology, health , environment and transport, for which regional priority directions of research were set up. Results for ICT and agriculture were used for the need of SEE-ERA.NET PLUS call, while others will be used as background material for future regional research strategy, and as contribution of the region for future work programmes for areas given within FP7. Also the study devoted to research infrastructures in the EU and in the countries of the region was carried out and their accessibility and openness toward researchers from abroad. Trainings with the most prestigious trainers have been organised, having for the topic successful applying for FP7 projects, then thematic ones designed for financial issues of FP7, project management, etc. Also activities of support to the system of National Contact Points for FP7 are in progress.

WBC-INCO.NET project is significant for providing logistic support to meetings of **Steering Platform on Research for Western Balkans countries**. The Platform is a political forum, devoted to stimulating, monitoring and support for development of scientific policies in the region, but also to strengthening of existing cooperation. Beside the countries from the region, all European countries are its members. Meetings of the Platform are organized each six months, and they are co-chaired by the European Commission (Directorate General for Research), the country which presides over the EU and one of the countries of the Western Balkans. The meetings are also attended by the representatives of international initiatives and programmes, such as the World Bank, Cost, Switzerland National Foundation for Science etc. Importance of the initiative is enhanced from meeting to meeting, which is indicated by the growing number of countries and initiatives interested in cooperation with the region.

Montenegro was the first co-chairing country of the region (Jun 2008 - Slovenia), and it is planned that one of the meetings during 2010 will take place in our country.

ii) NATO Programme Science for Peace and Security

Montenegro has been involved in scientific programme for peace and security, as well as participation of its representative in the Committee since 2007. Priorities of Montenegro in this Programme are:

- information security
- environmental protection
- socio-economic sciences and humanities
- biotechnology

iii) CIP EU programme (EU Competitiveness and Innovation Programme) - EIP (component designed for entrepreneurship and innovation)

Montenegro has been associated to one of the components of CIP EU programme since March 2008. (EU Competitiveness and Innovation Programme) – **EIP (component designed for entrepreneurship and innovation),** through which support for development of entrepreneurship and innovative capacities is realised, particularly regarding small and medium sized enterprises. By associating to this component participation of researchers in other components of the Programme is enabled as well. The competent institution is Directorate for Development of Small and Medium Sized Enterprises. From the budget of this programme, the Directorate got support for establishing the European Centre for Innovation and Information of Montenegro. Due to that, the Directorate was proposed by the Ministry of Education and Science as the institution which would be responsible for the **EUREKA initiative** (**pan-European network for market oriented research).**

Beside the above mentioned programmes and projects, Montenegro has its representatives in numerous international committees and forums:

JRC Government Board (Government Board of Joint Research Centres),
ESFRI (European Strategic Forum on Research Infrastructures),
CREST (Scientific and Technical Research Committee),
SCAR (Scientific Committee on Agricultural Research)
ESBN (European Soil Bureau Network)

iv) E.CRIS.CG – Forming of codified and classified base of researchers in Montenegro

At the beginning of 2009, the Ministry of Education and Science, on the basis of agreement with the Institute from Maribor IZUM, started implementation of activities regarding forming codified and classified base of researchers in Montenegro. Based on that, **E-CRIS.CG** was set up (Current Research Information System in Montenegro) *www.e-cris.cg.cobiss.net* .

Currently, data on 915 researchers and 22 research organizations are available for the public. Number of researchers who register themselves is getting bigger every day. Researchers from the University of Montenegro are still dominant, but overall inclusion of other researchers and research institutions from Montenegro (faculties, research institutes, agencies, centres, private companies) is expected by the end of the year.

v) Statistical monitoring of scientific-research activities

Setting up of **statistical monitoring of research activity** was one of the most important activities in the last year. Reform of scientific statistics has started in cooperation with TAIEX expert mission within which working plan for creation of a new questionnaire for research and development with model of methodological adjustment was created. Beginning of work on this questionnaire is expected by the end of this year. Montenegro has had very unstandardized and sporadic statistical monitoring in this domain. Partners on this activity are the Ministry of Education and Science and MONSTAT. If activities are continued regularly, complete achievement of indicators for monitoring of this measure could be expected, or in other words regular updating of statistical data on research activities.

vi) Bilateral Cooperation with the countries from the region

Aiming to provide continuation as well as setting up of bilateral cooperation in the region, the Government of Montenegro concluded agreements on scientific and technological cooperation with the Governments of the following states:

- the Republic of Slovenia 2 July 2008, signed in Becici;
- Bosnia and Herzegovina 1 December 2008 signed in Sarajevo;
- the Republic of Albania 16 December 2008 signed in Podgorica;
- the Republic of Croatia 26 January 2009 signed in Podgorica;
- the Republic of Austria 10 Jun 2009, signed in Podgorica.

On the basis of the Agreement on Scientific and Technological Cooperation between the Government of Montenegro and the Government of the Republic of Slovenia which was signed on 2 July 2008 in Becici, text for Call for co-financing of scientific and technological cooperation between Montenegro and the Republic of Slovenia for the period from 2010 to 2011 was prepared and harmonized. The Call was announced at the same day in Montenegro and in the Republic of Slovenia, on 3 July 2009. The deadline for submitting of applications for research projects was 30 September of this year. Selection of applications of Montenegrin projects for discussion before the competent international body, Joint Montenegrin-Slovenian commission for scientific and technological cooperation, is being prepared by national commission of experts in accordance with the following criteria:

- relevancy of financing programmes;
- stimulating of new bilateral projects;
- multilateral networking and regional connecting;
- quality and originality of research approach;
- qualification of project applicants;
- support to young researchers and
- common interest.

Depending on applicability and results of the project, applications which have support of the partners from the industry have advantage during the selection and acceptance of the project.

On the basis of Memorandum on understanding between the Ministry of Education and Science of Montenegro and the Ministry of Science, Education and Sports of the Republic of Croatia which was signed on 18 June 2008 in Zagreb, and Agreement on Scientific and Technological Cooperation between the Government of Montenegro and the Government of the Republic of Croatia which was signed on 26 January 2009 in Podgorica, the Programme of Cooperation in the areas of science, technology and education was signed in Podgorica on 9 July 2009 for the period 2009-2012 between the Ministry of Education and Science of Montenegro and the Ministry of Science, Education and Sports of the Republic of Croatia. The harmonization of the following texts is in progress: the Call for co-financing scientific and technological cooperation between Montenegro and the Republic of Croatia and of the Call for granting of scholarships for undergraduate and postgraduate studies and study visits to the Republic of Croatia for the academic year 2009/2010.

b) National Programmes

Aiming to realize scientific and research policy the **Ministry of Education and Science** announces Call for financing of scientific and research activities according to the Article 39 of the Law on Scientific- Research Activities (Official Gazette of the Republic of Montenegro 71/05) in respect to:

- scientific and research projects (national, bilateral and participation in multilateral projects),
- professional development of researchers in the country and abroad,
- procurement of scientific and research equipment.

Call for financing scientific and research projects in the period 2000-2008 was announced 4 times: in 2000, 2005, 2007 and 2008.

Call applications for financing scientific and research projects are divided according to scientific areas:

- natural sciences and mathematics;
- technical and technological;
- biotechnological;
- medical;

- social sciences and humanities;
- interdisciplinary projects.

Conditions for applying for calls for approval of applications are provided by:

- the Law on Scientific - Research Activities, by the Article 33 paragraphs 2 and 3 which provides that:
- scientific - research project is managed by a project manager and that the Ministry prescribes conditions that are to be fulfilled by the project manager;
- the Article 9 of the Rulebook on utilization of funds for scientific activities No. 1200/95 provides for competence of project managers on the basis of score of coefficients of the published scientific papers, the value of which has to be more than 30, and in last 5 years more than 10;
- the Article 9 paragraph 4 of the Rulebook on criteria for appointment of experts and procedure of evaluation of scientific and research projects by the experts, No. 314/05 provides that the positively evaluated project is to have at least 24 points, on the basis of score of marks of 8 criteria from the Model of expert project evaluation (marks used are 0-5).

Once a year, the Ministry announces a **call regarding professional development of researchers in the country and abroad**, namely for:

- stimulating researchers – project coordinators for submitting applications to FP7;
- scholarships at postgraduate studies;
- scholarships at PhD studies;
- submission, assessment and defence of PhD dissertations;
- technical processing of PhD dissertations;
- participation of researchers in scientific congresses abroad;
- organizing scientific congresses in Montenegro;
- CEEPUS programme and other mobility programmes of university professors, researchers and students.

Call for co-financing of procurement of capital, medium and small scientific and research equipment, was announced by the Ministry last time in 2007.

What is considered as capital equipment is equipment the value of which is over EUR 20 000, and as medium and small equipment that the value of which is under EUR 20 000.

The Ministry co-finances procurement of equipment for those scientific - research institutions which fulfil the condition that by providing the equipment:

- the existing science and research equipment would be completed and improved, which would significantly improve characteristics of existing devices or methods;
- the set of methods by which existing laboratory qualifies for scientific and professional expertise and research in European projects would be completed;
- the qualification of researchers for scientific and research work would be improved;
- research in scientific and research projects would be enabled, particularly in international cooperation projects.

Co-financing of equipment procurement is allowed for scientific and research institutions in which there are also human resources potentials qualified for utilisation of equipment.

For the equipment which is used exclusively for scientific and research work, contribution is not to be provided, and for the equipment which is used for carrying out professional tasks (diagnostics, market activity etc.) contribution of 20% of equipment value is to be provided.

Research institutions also acquire scientific equipment on the basis of donations of foreign governments, foreign institutions and organizations or cooperative institutions within bilateral cooperation on projects, as well as by purchasing from their own funds.

Tax and duty relieves for the procurement of scientific and research equipment from abroad are provided for on the basis of:

- Article 41 of the Law on Scientific - Research Activities which stipulates that: ”the equipment used for scientific - research activities, which is received as a donation from abroad or is purchased abroad may be duty and value added tax free on the basis of opinion of the Ministry”;
- Article 25 paragraph 1 item 12 of the Law on Value Added Tax (Official Gazette of Montenegro 65/01, 12/02 and 76/05);
- Article 184 paragraph 1 item 1 of the Customs Law (Official Gazette of Montenegro 7/02, 38/02 and 72/02), and
- Article 2 of the Instruction of the Ministry of Finance on the manner of implementation of procedure regarding the exercise of right on remission of value added tax in cases when it is thus prescribed by an international agreement or treaty (Official Gazette of Montenegro 34/03).

Organisation of research at national level

Scientific - research activities in Montenegro are regulated by:

- the Constitution of Montenegro;
- the Law on Scientific - Research Activities (Official Gazette of the Republic of Montenegro 71/05);
- the Law on Higher Education (Official Gazette of the Republic of Montenegro 60/03);
- the Law on Montenegrin Academy of Sciences and Arts (Official Gazette of the Republic of Montenegro 24/94 and 30/94);
- The Strategy on Scientific - Research Activities of Montenegro (2008-2016) which was adopted by the Government of Montenegro on 17 July 2008.

The Constitution of Montenegro, in Chapter “Schooling”, Article 75 paragraph 3, guarantees the autonomy of universities, higher education and scientific institutions, and in Chapter “Freedom of Creativity”, Article 76, guarantees „the freedom of scientific and cultural creativity as well as freedom of publishing of scientific and cultural works, scientific and technical inventions, and moral and property rights to their creators”.

Chapter “Science, Culture and Arts” Article 77 stipulates that ”the state fosters and supports development of education, science, culture, arts, sports, physical and technical culture. The state protects scientific, cultural, artistic and historical values.”

The Law on Scientific - Research Activities (Official Gazette of the Republic of Montenegro 71/05) regulates scientific and research activities, organization, conditions and manner of financing of these activities and other issues significant for carrying out of scientific and research activities.

It is provided by the Law that scientific and research activities are of public interest as well as that carrying out of these activities is free and available for all domestic and foreign natural and legal persons.

The principles on which scientific and research activities are based within the meaning of the Article 3 of the Law are:

- increase of cultural and industrial development of Montenegro;
- spreading and deepening of scientific knowledge;
- development of science for the purpose of efficiency, preservation and development of general knowledge ;
- increase of efficiency of scientific and research activities and connecting of organizations within science, education and industry;
- inclusion in the European Research Area and framework programmes of the European Union for science and research activity;
- freedom and autonomy of scientific creativity;
- education of high level quality professionals for research and development;

- ethics and responsibility of researchers who carry out scientific and research work for consequences of their work;
- sustainable development and protection and improvement of environment;
- protection of personality and dignity of researchers who carry out scientific and research work;
- international quality measures;
- enhanced investments in scientific and research activity;
- connection of researchers who carry out scientific and research work at national and international level.

The Law also provides the following: types of research; realisation of scientific - research activities; strategy of scientific - research activities; Council for scientific - research activities; scientific and research institutions (definition of the institution, conditions for establishing, issuing of licences, register of licensed institutions, statute of the institution; professional bodies); public institutions (establishing of public institutions, managing body, approval of statute, competence of management board, work transparency, director); private institutions (establishment of private institutions, autonomy of private institution); research and scientific titles (who can carry out scientific and research activities, research title, scientific title, election, appropriate application of provisions of the Law on Higher Education on election to scientific titles at the University and in the institutions of higher education, comparability of scientific titles with the academic titles, managing of scientific and research projects); financing (transparency of financing, acquiring of financial means, priorities for co-financing of projects; gain of profit; utilization of means; announcing of calls for financing of scientific and research activity from the state budget funds; managing of data base for the area of science and research; customs and tax relieves; penalty provisions and transitional and final provisions.

The Law on Higher Education (Official Gazette of the Republic of Montenegro 60/03) regulates fundaments of higher education, conditions for carrying out of activity, types of programmes, and principles of organizing institutions which carry out this activity as well as other issues significant for performing the activity of higher education in Montenegro. The area of science and research is regulated by this Law as well. The objectives of higher education include the following:

- setting up, improvement and development of knowledge, science, arts and culture and
- transfer of general, scientific and professional knowledge and skills through teaching process and research.

In addition to this, besides the higher education system, this Law also regulates the area of science and research by providing the following: the Government provides financial means for financing of teaching process, research and artistic work of public interest; the institution has the right to independently develop and implement curricula and research projects; whilst carrying out of activity the institution establishes specific profitable forms of organization for education and research purposes; academic staff of the university is free to publish results of their research, in accordance with the regulations of the university relating to utilization of intellectual property rights at an advantage of the university; the university is autonomous institution that in its work consolidates scientific and research and artistic work as parts of unique process of higher education; the university realises its activity through: faculties, academies, institutes and higher applied schools, as organizational units, as well as through realisation of particular study programmes; the statute of public institution regulates more precisely carrying out of research, scientific and artistic work; public institution is financed from the state budget for teaching process, research and artistic work and from projects and contracts with national, international, state or private subjects for the purpose of promotion of teaching process, research and consulting activity; the Government, with the opinion of the Council for Higher Education adopts norms and standards for gain of financial means and financing of both public and private institutions and prescribes methodology for allocation of financial means for the purpose of teaching process, research and artistic work, having in mind quality of education of certain study programmes which are realised by these institutions; public institution is free to promote and use education and research activities for the purpose of gain of profit for the benefit of institution with previous Government approval when that activity includes or could include utilization of rights of any significant intellectual property in any literary, artistic or scientific works, scientific discoveries, projects, inventions, goods

or services which are entirely or partially, directly or indirectly provided by the state budget; existing institutes continue work as organizational units of the University in accordance with the law and statute.

The Law on Montenegrin Academy of Sciences and Arts - CANU (Official Gazette of the Republic of Montenegro 24/94 and 30/94) regulates activities, organization and work of this highest institution within scientific and artistic area in Montenegro. CANU performs its activity through: realization of scientific research; publishing of scientific results; organizing of scientific conferences; supporting scientific and artistic work in other scientific institutions; educating and training young scientists and artists; encouraging and fostering of scientific critics; organizing collecting of scientific material and literature, as well as through giving proposals and opinions to national authorities and to other subjects of economic, cultural and public life aiming to provide conditions for scientific work and artistic creativity, improvement of organizing of science for the purpose of better solving of certain long term and current problems of social development.

The Strategy for Scientific - Research Activities for the period of eight years, 2008-2016 was adopted by the Government on 17 July 2008 on the proposal of the Council for Scientific - Research Activities, on the basis of Article 6 of the Law on Scientific - Research Activity for the purpose of establishing the priorities, fostering and monitoring of these activities.

This strategy defines:

1. objectives and tasks of scientific - research activities;
2. harmonization of scientific - research activities with laws and strategic documents;
3. institutional framework for development of scientific - research work;
4. research, innovation and technological development;
5. international cooperation;
6. financing of scientific - research activities and
7. realisation of objectives and monitoring of implementation of the Strategy recommendations.

1. Please describe the institutional framework, with reference to the role and competence of ministries, national committees, parliamentary committees and regional authorities.

The Ministry of Education and Science, as national authority competent for scientific tasks, monitors situation within scientific and research activity in Montenegro, on the basis of the Law on Scientific - Research Activities (Official Gazette of the Republic of Montenegro 71/05) and on the basis of the **Decree on organization and manner of work of public administration** (Official Gazette of Montenegro 59/09.)

Article 8 of the Decree lays down that the Ministry of Education and Science carries out administrative tasks which, besides the tasks referring to education system, relate also to the system of science as follows:

- supervision of legality of work of institutions within the area of education and science; higher education;
- development of scientific - research activities;
- development of scientific - research organizations and services;
- development of science and application of scientific achievements in specific areas;
- tasks of technological development;
- system of financing of institutions, organizations and services within the area of science;
- supervision within areas for which the Ministry was established;
- as well as other tasks which are defined as its competencies.

Article 2 of the **Rulebook on internal organization and systematization of the Ministry of Education and Science**, which was adopted by the Government of Montenegro, at the sitting on 30 October 2008 stipulates internal organizational items within which the tasks of the Ministry are carried out:

- Department for pre-school and primary education and education of persons with special needs;
- Department for secondary, higher vocational education, education of adults and education of minorities and other minor national communities;
- Department for higher education:
  Department for higher education and
  Department-National Information Centre (ENIC)
- **Department for science, research and technological development;**
- Section for normative and legal tasks and harmonization of regulations;
- Section for international cooperation and European integrations;
- Section of education inspection;
- Section for information and communication technologies;
- Section for students' standard;
- The Cabinet of the Minister;
- Service for investments and public procurement;
- Service for finance and accountancy and
- Service for human resources and general tasks.

On the basis of Article 6 of the Rulebook, Department for science, research and technological development carries out administrative tasks relating to this area and professional tasks referring to: work of the Council for Scientific - Research Activities; carrying out of plans of scientific and research activity; design of scientific policy and strategy; proposal and implementation of laws and other regulations; monitoring of implementation of the Strategy on Scientific - Research Activities in Montenegro; implementation of procedure of the call for financing of projects and programmes; setting up of programme and financial criteria for assessment of projects and criteria for their results; evidence of realization of scientific results; undertaking of measures for realisation of results of scientific research in accordance with the needs of social and economic development; setting up of criteria for selection and programme of professional development of scientists; setting up of programme and financial criteria for financing of scientific infrastructure and work of public scientific institutes; keeping of evidence on the capital and medium scientific infrastructure and work of public scientific institutes; keeping of register of capital and medium scientific equipment and keeping of register of scientists and scientific organizations; implementation of activities which are related to the procedure of applying, evaluation, selection and financing of national scientific projects which are financed through budget means; implementation of all activities which are related to preparation of bilateral treaties within area of science, research and technological development and realization of all obligations which result from it; international exchange of researchers; participation in creation of documents which prescribe conditions of applying for a competition, forming and technically supporting bodies which realise competitions; carrying out of activity for creation of regulations from the area of scientific and research activity; forming and updating data base on scientific and research projects for particular scientific areas; as well as data on number of engaged researchers per area; providing technical support for work of the Council for Scientific and Research Activity; public announcement and presentation of the EU framework programmes, INVO programme, COST, EUREKA, NATO CFP, UNESCO, UNDP; participation in meetings of international professional bodies and conferences; organization and coordination of NCP for particular programmes or parts of programme; providing technical support for applying for programmes, in cooperation with contacts in scientific and research institutions; standardization of criteria for accreditation of scientific and research institutions and methodology of issuing of licences; implementation of procedure of accreditation and issuing of licenses; creation and updating base of scientific and research institutions and other tasks from its area of activity.

Article 36 of the Decree prescribes that the **Bureau for International Scientific, Educational, Cultural and Technical Cooperation** – ZAMTES carries out tasks referring to: planning and programming, realization, harmonization and records of international scientific, educational, cultural and technical cooperation of Montenegro with other states, regional communities and international organizations; taking care of realization of programmes which are financed from the budget of Montenegro; schooling and professional development of foreigners in Montenegro and citizens of Montenegro abroad; proposing and providing realization of activity from the Republic in cultural and informative centres abroad; collecting, processing and distribution of proposals and

appropriate data, information and programmes within the area scientific, educational, cultural and technical cooperation as well as other tasks which are in its competence.

Pursuant to Article 12 paragraph 1 item 2 of the Rules of Procedure of the Government of Montenegro (Official Gazette of the Republic of Montenegro 48/09), the **Commission for Economic Policy and Financial System** was set up.

Competencies of the Commission are laid down by Article 14 of Rules of Procedure. On its basis the Commission considers proposals for a law, other regulations and general acts and other materials referring to science (as well as to all social activities).

On the basis of Article 21 of the Rules of Procedure, the Commission submits written report to the Government which contains findings and assessment of the reviewed material and proposals for conclusions within the form which should be adopted by the Government.

The **Committee for Education, Science, Culture and Sports** was established by Article 38, paragraph 1 item 9 of the Rules of Procedure of the Parliament of Montenegro (Official Gazette of the Republic of Montenegro 51/06 and 66/06).

The area of the Committee was laid down by Article 47 of the Rules of Procedure on the basis of which the Committee considers bills, drafts of other regulations and general acts and other issues referring to: pre-school, primary, special and secondary education; higher education; science; scientific - research activities; culture; arts; technical culture; international scientific, educational-cultural and technical cooperation; protection of scientific, cultural, artistic and historical values; sport and physical culture.

There is no institutional framework for the scientific and research area at local and regional level.

2. Do you have advisory committees on how to conduct research policy? Any bodies involving private sector?

Council for Scientific - Research Activities is appointed by the Government on the basis of Article 7 of the Law on Scientific - Research Activities for the purpose of improvement of scientific - research activities in Montenegro.

Decision concerning appointment of the Council was published in the Official Gazette of the Republic of Montenegro 56/06, 25/07 and 38/08).

Competence of the Council was provided for by Article 8 of this Law, which lays down that the Council analyses conditions and achievements within scientific and research area, gives professional proposals to the Government and is authorized for:

- preparing and proposing of the Strategy on Scientific - Research Activities;
- proposing of priorities from the Strategy for current year;
- offering opinion on criteria for election in academic titles;
- giving opinion on laws and other regulations within the area of scientific - research activities and of other areas, which provide general conditions for fostering scientific - research activity and utilization of its results;
- giving opinion during procedure of laying down of range of financial means for financing priorities from the Strategy;
- monitoring of the Strategy realization;
- cooperation with the Council for Higher Education;
- carrying out other tasks which are prescribed by the Law and act concerning establishing of the Council.

On the basis of Article 9 of the Law and Article 3 of Decision on establishing of the Council, the Council has 9 members who are appointed for the period of six years. One third of the Council members are appointed from the members of the Government, and two thirds are prominent experts who give significant contribution within the area of science and research. At the moment,

there are no representatives of researchers from the private sector, but institutional framework allows it.

Council for Higher Education is established by the Government on the basis of Article 11 of the Law on Higher Education, for the purpose of improvement of the area of higher education in Montenegro.

Decision concerning setting up of the Council was published in the Official Gazette of the Republic of Montenegro 31/04, 47/05 and 22/08.

On the basis of Article 12 of the Law, the Council analyses conditions and achievements within higher education, gives professional proposals to the Government and is authorized for:

- preparation of draft of a strategy for development of higher education;
- giving opinion during the procedure of laying down of regulations for issuing, changing and revoking of license;
- giving opinion on criteria for election into academic titles;
- giving opinion during the procedure of prescribing regulations for financing of higher education;
- laying down of standards for assessment of study programmes with view of their compatibility with professional needs and international comparability;
- undertaking of periodical quality control of licensed institutions and issuing of certificate for initial accreditation, accreditation or reaccredidation, and
- carrying out of other tasks prescribed by the Law and act concerning establishing of the Council.

Responsibility of the Council for Higher Education in Montenegro is laid down by Article 13 of the Law, as well as its duty to support institutions in development of their potentials and improvement and maintenance of quality of their activity.

Pursuant to Article 14 of the Law and Article 3 of the Decision concerning the establishment of the Council, there are 11 members of the Council, who are appointed by the Government for the period of six years. Council consists of six members from the line of prominent experts within the area of higher education, science, technology and arts who are appointed on proposal of the universities and five members from the area of industry, social activities and other relevant institutions. By appointing representative of Chamber of Commerce for the member of the Council, private sector has been included in policy development within the area of higher education.[1]

3. Please describe the national policy for research and technological development (RTD). Please refer to the priorities, priority sectors, targets, target groups, and instruments to conduct research.

Strategy of Scientific - Research Activities for the period of eight years, from 2008 to 2016, which was adopted by the Government on 17 July 2008, on the basis of Article 6 of the Law on Scientific - Research Activities, provides for priorities, fostering and monitoring of scientific - research activities in Montenegro.

Successfulness of the science is reflected in satisfying general developmental needs, its connecting with education and human resources development and with industrial and economic growth.

The primary task of the Strategy is to foster development of the science and technology and enhance their overall contribution to development of the society with the highest possible appliance of the new one through connecting science with education and with industry, and creation of one's own knowledge and technology.

[1] Work of the Council for Higher Education has been described in Chapter 26 - Education

Aiming to realize this task, following **priorities and objectives** were set up:

- to emphasise the importance of science and research within the context of further social-economical growth and transformation into modern knowledge based society;
- to provide the Government of Montenegro with expert framework, recommendations and support in concrete activities which have been undertaken for the purpose of improvement and creation of conditions for carrying out of scientific and research work and draw attention of the competent ministries to the necessity and legitimacy of investing in scientific and research work;
- to support allocation of funds for science and scientific infrastructure in accordance with the recommendations from the Lisbon Strategy and propose appropriate dynamics of allocation in relation to the GDP;
- to emphasise role and significance of human resources potentials for science and technology development, primarily through development of young researchers and inclusion in the European Research Area (ERA);
- to stimulate technological development and innovation and draw attention of industrial subjects to the fact that their market success depends on acquisition and usage of new and better innovation, successfulness of appliance and promotion of scientific results and development of new technologies the products of which are attractive to the market;
- to provide recommendations for optimisation and possible reorganization of institutional framework for realization of scientific and research activity for the purpose of more efficient acting;
- to emphasise the significance of the system of scientific informing and the role of information and communication technologies, ICT;
- to support significance of setting up of stimulating legal measures (measures of tax policy) and of
- adopting appropriate regulations (for example, within protection of intellectual property);
- to identify the most important areas of scientific and research work, bearing in mind natural, technological and human resources comparative advantages of Montenegro;
- to define priority areas and activities, as well as methods for monitoring of realisation of adopted tasks by an appropriate Action Plan;
- reform of institutional framework for carrying out of scientific - research activities;
- fostering innovation and technological development;
- fostering international cooperation at all levels of scientific - research activities;
- realization of functional priorities of scientific - research activity and
- increase of investment in scientific and research activity.

According to the recommendations from the Strategy on Scientific - Research Activities, that the base for monitoring is one year period, review of the list of priority tasks that could be completely implemented until 2010 or 2011 was carried out. Most of the indicators mentioned in the Strategy Action Plan are measurable at annual level.

It is necessary to emphasise that the insight into specified measures shows different levels of implementation for priority tasks. Differences between levels of implementation during the first year have appeared as a natural consequence of different implementation deadlines (from two to eight years), as well as consequence of inactivity within certain areas which was provoked by a number of circumstances. As positive examples of wide application of specified measures, some of the activities on reform of institutional framework for carrying out of scientific - research activities could be pointed out, as well as fostering of international cooperation at all levels.

Priority sectors of research are:

- science and education;
- natural and cultural heritage, demographic structure, national identity and language;
- ecology;
- tourism;
- agriculture;
- health of citizens;
- energy.

Instrument to conduct research is Call for co-financing of scientific and research activity from the state budget, referring to: scientific - research projects (national, bilateral and participation in multilateral projects), professional development of researchers in the country and abroad, procurement of scientific and research equipment.

Target groups are: researchers from public and private sector, with special accent on professional training of young researchers.

4. How is research and technological development organised? Please refer to:

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

The Law on Higher Education regulates fundaments of higher education, conditions for carrying out of activity, types of programmes, and principles of organization of institutions which carry out this activity, as well as other issues significant for carrying out of the higher education activity in Montenegro.

On the basis of this Law, the following institutions of higher education have been accredited in Montenegro:

- University of Montenegro – public university;
- University Mediterranean – private university;
- 9 independent private faculties.

The University of Montenegro is comprised of following organizational units: 19 faculties, 3 institutes and 4 independent study programmes.

The Faculties are:

- Faculty of Economics in Podgorica
- Faculty of Law on in Podgorica
- Faculty of Natural Sciences and Mathematics in Podgorica
- Faculty of Electrical Engineering in Podgorica
- Faculty of Metallurgy and Technology in Podgorica
- Faculty of Mechanical Engineering in Podgorica
- Faculty of Civil Engineering in Podgorica
- Faculty of Architecture in Podgorica
- Faculty of Medicine in Podgorica
- Faculty of Political Sciences in Podgorica
- Faculty of Biotechnology in Podgorica
- Faculty of Philosophy in Nikšić
- Faculty for Sports and Physical Education in Nikšić
- Music Academy in Cetinje
- Faculty of Fine Arts in Cetinje
- Faculty of Drama in Cetinje
- Faculty of Marine Studies in Kotor
- Faculty for Tourism and Hotel Management in Kotor and
- Faculty of Applied Physiotherapy in Igalo.

Institutes are:

- Institute of Marine Biology in Kotor
- Institute of History in Podgorica
- Institute of Foreign Languages in Podgorica.

Independent study programmes are:

- Pharmacy

- Teacher Training in Albanian
- Geodesy
- Dentistry.

Teaching process and research in clinical subjects at the Faculty of Medicine in Podgorica and at the Faculty for Applied Physiotherapy is carried out by the employees of: Clinical Centre of Montenegro in Podgorica, Institute for Pulmonary Diseases in Brezovik – Nikšić, Institute for Public Health in Podgorica, Public Health Care Institution for Primary Health Care in Podgorica, and Institute "Dr Simo Milošević" in Igalo.

Private **University Mediterranean** is comprised of 6 faculties:

- Faculty for Tourism in Bar
- Montenegro Business School in Podgorica
- Faculty for Information Technologies in Podgorica
- Faculty for Visual Arts in Podgorica
- Faculty of Law in Podgorica and
- Faculty of Foreign Languages in Podgorica.

Independent private faculties are:

- Faculty for Business Management in Bar
- Faculty for Administrative and European Studies in Podgorica,
- Faculty of Law Sciences in Podgorica
- Faculty for International Economy, Finances and Business in Podgorica,
- Higher School of Nursing "Queen Jelena" in Igalo,
- Faculty for Information Systems and Technology in Podgorica,
- Studies in Humanities in Podgorica,
- Faculty for Management in Traffic and Communications in Berane and
- Faculty for International Hotel and Tourist Management – St. Stefan in Miločer.

Governmental research centres and military research centres have not been established yet in Montenegro.

The Law on **Montenegrin Academy of Sciences and Arts** - CANU (Official Gazette of the Republic of Montenegro 24/94 and 30/94) and the Statute of this institution regulate activities, organization and work of this highest institution in Montenegro within the area of sciences and arts.

CANU realises its activity through 3 sections and 25 committees:

- Division for Natural Sciences (with 10 committees)
- Division for Social Sciences (with 9 committees) and
- Division for Arts (with 6 committees).

On the basis of Articles 7, 8 and 9 of the Law, it is laid down that tasks of CANU are to be realised by its members and other scientists and artists who cooperate for the purpose of realization of its plans and programmes and that CANU consists of members in the working body and foreign associates. The working body of CANU is made of: full members (academics) and associate members.

Private foundations and research centres of public industry have not been set up yet in Montenegro.

Majority of companies had research and developmental centres (Aluminium Plant – Podgorica, Steel Works – Nikšić, Agri-Complex "13 July") until ownership was changed in our system.

After the ownership was changed it can be stated that there was cessation of work of research and developmental centres, except formally of the Institute for Ferrous Metallurgy.

b) centres of excellence;

Centers of Excellence have not been established yet in Montenegro.

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

Nature of research activities in Montenegro has had so far character of: **public, civil, institutional and basic** research. Other types of research activities have not been significantly developed until now .

On the basis of Article 39 of the Law on Scientific and Research Activity, the Ministry of Education and Science announced calls for financing of scientific and research projects four times: in 2000, 2005, 2007 and 2008.

- In 2000, 98 projects were accepted for contracting and 145 projects were financed altogether (47 previously agreed upon + 98 new ones).
- In 2005, 56 projects for contracting and financing were accepted.
- In 2007, 8 projects were accepted for contracting and financing. Within these projects 9 young researchers at PhD studies were engaged. They have been employed for the period of three years in the institution which conducts the research, and within this period they are to complete PhD studies.
- In 2008, 66 projects were accepted for contracting, and 74 projects were financed altogether (eight previously agreed upon + 66 new ones).

Until 2005, the **Ministry of Education and Science** financed wages and other incomes on the basis of work of employees that are employed in scientific institutes (the Institute for Marine Biology in Kotor, Institute for Biotechnology in Podgorica and Historical Institute in Podgorica) through scientific and research projects. From 2005, the University of Montenegro took over financing of wages of employees of the institutes which resulted in decreased number of accepted projects.

According to the type of research, the Ministry co-financed applied research with 70% of overall project value, whilst fundamental/basic research was co-financed 100%.

There was not any developmental research within this period.

Although Article 36 paragraph 2 of the Law on Scientific and Research Activity provides for possibility for private institutions and other natural and legal persons to acquire financial means from the state budget, under condition to realize scientific and research programme in accordance with the Strategy, their interest for applying scientific and research projects to competitions of the Ministry have not been expressed so far.

Overview of financed national scientific and research projects from 2000 to 2008

(during the years when competitions for acceptance of new projects were announced)

per areas of sciences

Ordinal No	Scientific Area	2000	2005	2007	2008	**Altogether**
1	Natural Sciences and Mathematics	26	21	4	20	**71**
2	Technical and Technological Sciences	34	25	2	21	**82**
3	Biotechnological Sciences	42	2	1	15	**60**
4	Medical Sciences	14	2	-	4	**20**
5	Social Sciences and Humanities	29	6	1	14	**50**
Total of Financed Projects		**145**	**56**	**8**	**74**	**283**

Beside national scientific and research projects, the Ministry financed bilateral scientific and research projects with the Republic of Slovenia and the Republic of Greece.

Bilateral cooperation is carried out through realization of common scientific and research projects through mobility of research teams, and financing is carried out in following manner:

- sending party covers costs of international transport for researchers in departure and return
- receiving party covers costs of accommodation and nourishment.

Projects are to be realized within the period of two years.

Overview of number of realized bilateral projects of Montenegro with the Republic Slovenia

Ordinal No.	Scientific Area	2004/2005	2005/2006	2006/2007.	**Altogether**
1.	Natural Sciences and Mathematics	3	-	1	**4**
2.	Technical and Technological Sciences	1	-	3	**4**
3.	Biotechnological Sciences	-	1	1	**2**
4.	Medical Sciences	1	1	1	**3**
5.	Social Sciences and Humanities	1	-	1	**2**
Total of Financed Projects		**6**	**2**	**7**	**15**

Bilateral cooperation of Montenegro with the Republic of Slovenia for the period 2004/2007 was realized through 15 common scientific and research projects from the following research areas: environmental protection; biology; biotechnology; agriculture; physics; mechanic, mechanical engineering; metallurgy; medicine, protection of cultural heritage and linguistics.

Overview of number of realized bilateral projects of Montenegro with the Republic of Greece

Ordinal No.	Scientific Area	2006/2008
1	Natural Sciences and Mathematics	6
2	Technical and Technological Sciences	6
3	Biotechnological Sciences	2
4	Medical Sciences	-
5	Social Sciences and Humanities	-
Total of Financed Projects		**14**

Within the period 2006/2008 bilateral cooperation of Montenegro with the Republic of Greece was realized through 14 common scientific and research projects from the following research area: environment protection, marine biology, biotechnology, agriculture, information and communication technology and new materials.

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

Currently, there are no records of research results per priority areas.

There is no data on scientific production, or data on quantifying of scientific production, but it is enabled to publish research results in scientific publications which are edited in Montenegro and abroad. Action Plan of the Strategy of Scientific - Research Activities within priority tasks of reform of institutional framework for carrying out of scientific and research activity, provides statistical monitoring of scientific and research activity as one of the measures. The subjects who are to realize these activities are Statistical Office - Monstat and the Ministry of Education and Science.

Majority of publications is published at the University of Montenegro. The University of Montenegro particularly stimulates publishing of scientific works in publications with stronger impact factor.

There is no ISC or other bibliometric data base. MONSTAT has some indicators of the state within scientific and research area, but not these.

At the moment, the University of Montenegro is working on the project from the FP7 REGPOT 2-2008 the subject of which is the evaluation of research capacities that would be basis for strategic planning in the field of science at the University of Montenegro. Through the process of evaluation of research activities we will get more precise bibliometric data. The project is planned to be completed in April 2010.

Researchers publish their scientific papers in international and national scientific journals which are edited abroad.

The following scientific journals, which were co-financed in the previous period by the Ministry, are published in Montenegro:

- **"Studia Marina",** for scientific areas: oceanography, marine biology and fishing,.

Publisher: the University of Montenegro – the Institute for Marine Biology in Kotor

ISSN 0585-5349

The last number was published in 2007.

- "**Historical Records**", for scientific area of historical sciences,

Publisher: the University of Montenegro: Historical Institute in Podgorica,

ISSN 0021-2652

The last number was published in July 2009.

- "**Agriculture and Forestry**", for scientific areas: agriculture, animal health, forestry and biology,

Publisher: the University of Montenegro – Faculty of Biotechnology in Podgorica,

ISSN 054-5579

The last number was published in 2005. (on the occasion of the 50th anniversary)

- **"Medical Records",** for scientific area of medical sciences,

Publisher: Society of Doctors of Montenegro

ISSN 0419-7747

The last number was published in 2009.

Beside the journals that are co-financed by the Ministry, some of the faculties of the University of Montenegro publish their journals independently – Faculty of Sciences and Mathematics, Faculty of Electrical Engineering, and Faculty of Law.

Montenegrin Academy of Sciences and Arts publishes its yearbook regularly, as well as the following annual couriers of the divisions:

- **Yearbook CANU,** ISSN 0351-1294
- **Courier of the Division of Natural Sciences,** ISSN 0350-5464
- **Courier of the Division of Social Sciences**, ISSN 0350-5472 and
- **Courier of the Division of Arts**, ISSN 0350-5480.

In virtue of Article 3 paragraph 1 indent 10 of the Contract on realization of scientific and research project, which is concluded by the institution – holder of scientific research, research manager and the Ministry of Education and Science, holder of scientific research is obligated to submit final report to the Ministry - elaborate on the project after finishing research, not later than two months after the ending of agreement period.

Within the period from 2000 to 2007 totally 62 final reports - elaborates were submitted to the Ministry on the projects on which research was completed and the agreement period of which expired. The Ministry submits final elaborates to the Central National Library “Djurdje Crnojevic” in Cetinje for permanent keeping, thus creating possibility for interested researchers to use results contained in the elaborates for the purpose of their research.

Beside final report – elaborate, holder of scientific research can submit a monography, a book, defended PhD dissertation, as well as copies of scientific papers published in international journals which are relevant for the area of project’s research.

In addition to this, research manager is obligated to submit, along with annual report on work on project, copies of his/her papers, as well as of papers of researchers who are engaged in realization of research, which are published in the year to which the report refers to.

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.

Promotion of research, technological development and innovation within the sector of the industry is realized through the work of the following bodies of national authorities and business associations: the Ministry of Economy, the Ministry of Education and Science, Directorate for Development of Small and Medium Sized Enterprises, Chamber of Commerce of Montenegro and Montenegrin Employers Federation, as well as through activities of international organizations and nongovernmental sector.

Main incentive instrument of the Ministry of Education and Science is the call for **co-financing of scientific and research and developmental projects**, for which industrial subjects are allowed to apply in partnership with research institutions.

Centre for promotion of innovation within business sector

At the end of 2007, the Directorate for Development of Small and Medium Sized Enterprises formed a consortium with the Chamber of Commerce of Montenegro, Faculty of Mechanical Engineering of the University of Montenegro and Business Start-up Centre from Bar for the purpose of preparation of the project for setting up of the Centre for Promotion of Innovation within business sector. Project proposal was submitted for the call within CIP programme and after positive evaluation of the project the **European Information and Innovation Centre Montenegro – EIICM** was formed. It started to work in November 2008. EIICM is the member of the Enterprise Europe Network.

Target groups for services of EIICM are: small and medium enterprises, institutions which carry out research and development, innovators, governmental bodies, professional organizations, educational institutions. EIICM, among other things, provides services for fostering of innovation, transfer of technologies and knowledge, as well as services which encourage participation of small and medium sized enterprises within Community Framework Programmes for Research and Technological Development.

EIICM work plan provides the following specific services of support:

Module B: Services for innovation, transfer of knowledge and technology

Important contribution to decrease of “Innovative gap“, creation of new jobs, increase and sustainable development is expected from:

- distribution of information which raise level of knowledge on policies referring to innovation, legislation and support programmes;
- distribution and usage of research results;
- providing mediatory services for technology and knowledge transfer and building up of partnership between all those who are included within the area of innovation and

- stimulating of company capacities to innovate.

Coordinator of EIICM activity within this module is the Chamber of Commerce of Montenegro

Module C: Services which encourage participation of small and medium sized enterprises within Community Framework Programmes for research and technological development:

- increase of level of knowledge of small and medium sized enterprises within Community Framework Programmes for research and technological development;
- supporting of small and medium enterprises to identify their needs for research and technological development and to find relevant partners and
- supporting of small and medium sized enterprises in preparation and coordination of project proposal for participation in Community Framework Programmes for research and technological development.

Coordinator of EIICM activity within this module is the Faculty of Mechanical Engineering of the University of Montenegro.

Technology centres and science and research parks have not been set up yet in Montenegro. Currently, a project proposal is being prepared, for development of a technology park, with which Directorate for Development of Small and Medium Sized Enterprises in cooperation with partners applies under IPA – Adriatic Cross-Border Cooperation Programme 2007-2013.

There are two **business incubators** in Montenegro, in Bar and Podgorica, developed in the partnership between local authorities and international organizations. Business incubator in Podgorica is directed toward innovative information technologies.

Specialized agencies for technology transfer have not been established yet.

5. Are there any actions relating to science in society and scientific based governance?

Actions relating to science in society in Montenegro are realized within the framework of formal structures of public authorities under supervision of the Ministry of Education and Science as well as through independent engagement of professional organizations and civil sector.

Scientific Education

The most numerous activities within this domain relate to reform processes within the first four educational cycles – education within the area of natural and technical sciences in primary school and gymnasium, training of teaching staff for new teaching methods and usage of teaching tools, as well as for introducing of new information systems in schools.

By realization of objectives from the curricula of mathematics and natural sciences area through adequate interactive methods of teaching process and learning, students are enabled to acquire knowledge on nature and its phenomena and to develop research and problem solving skills, numerical and skills for information usage. By working on the projects from different subjects students apply mentioned skills on other knowledge areas and in that way they create affirmative attitude towards natural sciences.

In the third cycle of nine - year primary school (7-9 grade) and in gymnasium students are allowed to choose on their own certain number of subjects through which they can in the best way express their creativity, satisfy their interests and deepen their knowledge in those subjects. By offering subjects from natural science and mathematics group, it is intended to increase interest of students for natural sciences, for the purpose of directing them in greater number towards that direction in further education process.

In primary school in 2008/09, 11 out of 34 offered optional subjects are from the group of natural sciences and mathematics. In gymnasium, 10 out of 35 optional subjects are from the group of natural sciences and mathematics.

However, Montenegrin educational system records state of low interest of pupils for natural sciences, mathematics and technical subjects, which is illustrated by the data on number of pupils

who choose these subjects as optional as well as low number of students who enrol in and complete studies from the area of natural and technical sciences.

Table 1: Data on number of pupils who choose mathematics and sciences and technical subjects as optional in 2008/09

Primary School				
Subject group	**Subject**	**Number of classes per week**	**Grade in which it is taught**	**Percentage of pupils per grade**
Science and Mathematics	Combinatorics and Elementary Theory of Numbers	1	VII	11.4
	Mathematical Workshop – Geometry	1	VIII	8.2
	Mathematical Workshop- Sets, Relations, Functions	1	IX	5.9
	Measuring in Physics	1	VII	5.1
	Oscillations and Waves	1	VIII	2.6
	Chemistry Through Experiments	2	VIII IX	2 2.4
	Characteristics of Marine Ecosystem	1	VII VIII	7.7 0.6
	Therapeutic Herbs	1	VIII	12.4
Informatic	Computer Processing and Text Design	1	VII VIII IX	27.3 6.4 2.5
	Graphic Production and Picture and Photograph Processing	1	VII VIII IX	2.2 12.6 20.2
	Production of Multimedia Presentations	1	VII VIII IX	7.3 12.3 9.7
Technical	Transport Education	1	VII VIII IX	5.1 2.9 1.1
	Modelling	1	VII IX	0.9 1.3
	Electrotechniques	1	VIII	3.0
	Electrotechnique, Radio-technique and Digital Telecommunications	1	IX	4.1

Gymnasium				
	Subject	**Number of classes per week**	**Grade in which it is taught**	**Percent of pupils per grade**
Biology	Molecular Biology and Genetics		III	6,4
	Biodiversity		I II III	6,9 5,2 1,9
	Ecology and Environmental Protection		I II III	31,9 21,0 3,7
Chemistry	Biochemistry			
	Chemistry and Life		I	14,6
	Methods and Techniques of Research in Chemistry		II	8,8
	Methods of Isolation and Identification of Organic Substances			
Physics	Chosen Chapters from Physics		III	7,2
	Mathematical Functions in Physics		I II III	3,4 1.9 0,9
	Problem Physics		I II	1,1 2,0

In primary school, pupils who express interest in widening and deepening of knowledge are offered additional teaching course in mathematics and natural sciences. Sections and clubs for talented pupils are being formed aiming to popularize these sciences and monitoring of new scientific achievement. Pupils from different grades are included in the clubs. The above mentioned activities in Gymnasium are realized through additional teaching process and compulsory optional contents.

Projects of teacher training which are organized by the Bureau for Education Services are: Development of Critical Thinking – RWCT (Reading and Writing for Critical Thinking) and Problem-based Learning[2].

In training programmes the emphasis is put on interactive methods of teaching process and learning. Teachers are supported to research their practice and to use modern knowledge resources in their professional development.

[2] Catalog of the Programme of professional development of teachers for 2008/2009, Podgorica 2008/2009

Teaching aids

Implementation of education reform in Montenegro started in 2003. It was preceded by making decision on conception of new school. One of the most important reform goals was "to make education a promoter of development together with science and technology[3]"

The basis of education programme is development of key competences "minimal package" which is necessary for each individual for personal development, employment and active participation in social life of the community[4].

The aim of the education reform was not only **the change of content,** but change **of manner of education.** As opposed to the teaching process conceived as a process of transfer of knowledge on contents burdened by factography, now it is insisted on knowledge construction[5]. During the teaching process pupil passes through those intellectual processes through which the science have already passed. The learning process is understood more as an act of discovering than as an act of receiving ready knowledge.

From 2003 to 2009, for the first time in the history of Montenegro, the textbooks for primary and secondary schools and partially for vocational schools were published in our own production, namely in Montenegrin and Albanian languages. In total, for primary and secondary schools, there are over 450 schoolbook titles (textbooks, workbooks, CD-s, handbooks for teachers…).

New Montenegrin textbooks followed the concept of new curricula, so that textbooks from science and mathematics abound with project works, experiments and ideas for mini research. It is insisted mostly on inductive reasoning (remark phenomena, research, compare, conclude, support with literature).

Content of each textbook which was positively assessed by the commission of reviewers, satisfied the following criteria:

- in line with the goals and standards of adequate education curricula;
- in line with modern scientific knowledge and tested facts;
- in line with democratic and civil values which are laid down by affirmative legislation;
- provides adjustment of theoretical and practical knowledge;
- provides interdisciplinary (vertical) and interdisciplinary (horizontal) connection of knowledge;
- provides pupils with the opportunity to acquire knowledge on different and various demand levels
- directs pupils towards use of other knowledge resources;
- supports interest and motivation for learning and research;
- supports pupils to think critically and to learn independently;
- it is in accordance with achievements and methodology of particular scientific areas and current didactic strategies and methodical requests of teaching subject;
- fosters intellectual activity of pupils and/or emotional experience by objective, pluralistic and critical approach in content presentation;
- enables gradual introduction of professional terminology and its explanation in accordance with developmental capacities and acquired knowledge of pupils[6].

On the basis of all education programmes it is insisted on development of the following skills (and that is considered in textbooks):

- **Development of the autonomy in learning** (analysis and information collecting from different sources, independent deducing, making discussion and argumentation);
- **Development of acquired knowledge application** (connecting of the previously learnt

[3] Book of Changes – Institute for Open Society, Montenegro, Podgorica 2001.

[4] In March 2000, the Council of Europe set the new strategic goal for the Europe to become the most competitive and most dynamic knowledge based society in the world.

[5] Constructivist learning theory.

[6] See complete content of the Standard for Textbooks and teaching aids at www.cgudzbenici.co.me

content with the things which are in the process of learning, connecting of the things which are learnt in school with things which really happen in life);

- **Development of capability of logical deducing** (data and facts classification in accordance with different criteria);
- **Development of capability for problem solving** (problem formulating, analysis of problem situations, developing of small projects, data collecting, data sorting, formulating of possible solutions and problem solving);
- **Development of capability for creative thinking** (designing of research plan, designing of research instruments, inventing of unusual – new solutions);
- **Developing of capability for critical thinking** (reconsideration of usual solutions, respect of individuality and difference, acceptance of thinking under the pressure of argumentation and not under the pressure of majority);
- **Developing of communicative capabilities** (argumented discussion, reporting, dialog pursuing);
- **Developing of initiative and activism of pupils** (active inclusion in solution proposing);
- **Developing tolerance and acceptance of communication** (active listening of another person, derogation of the attitude and not the personality, expressing openness to other and different).[7]

In order to implement all that is foreseen by the textbooks, it requires much better equipped school. E.g. it is evident that there are no laboratories for carrying out experiments and trials in physics and chemistry, and school libraries are not equipped with adequate modern literature.

Montenegrin edition of licensed magazine for children *National Geographic Junior* in which 40% of the content is made of local topics from biology, history, archaeology and culture should be mentioned. The quiz show organized for three years now on the First Channel of the Television of Montenegro, *Through Doors of Knowledge to Travelling,* awards the best participants with six day stay in Washington. All questions from the quiz are based on contents from the mentioned magazine.

PISA

Montenegro participated in the Programme for International Student Assessment – PISA 2006 and 2009 for the purpose of following changes in the education system and comparing with other countries of OECD and the world.

On the basis of the results of research PISA 2006, the *Report on Achievements of Pupils under the Programme for* International Student Assessment*–PISA 2006*[8] was written. The Report contains essential recommendations on the level of education policy/system, on the level of school and education curricula, as well as on the level of human resources who work in education.

Within the preparations for the cycle PISA 2009, *PISA Released Items – Science, Mathematics, Reading* were translated. They were presented and distributed not only to representatives of education policy, but also to teachers of all secondary schools from the mentioned subjects[9] and to the textbook authors. It is planned to introduce teachers of primary schools with PISA tasks. Beside that, Examination Centre, the institution responsible for external testing in education, organized teacher training for creation of tasks on the basis of those which were used in the programmes which are identified as significant on international level.

Motivating Young People to Choose Science and Technology

Aiming to provide fostering, promotion and popularization of science, the Examination Centre organized the State Knowledge Competition in natural and social sciences and foreign languages for those pupils who have special affinity for some areas and more knowledge than it is requested by school curricula. Through contests in natural sciences it is tested if the participants learnt

[7] Our school – methodological framework for analysis and quality improvement

[8] Prepared by the Ministry in 2008

[9] Sample of PISA testing included 48 secondary schools and 5200 pupils of first and second grade.

enough from certain subject and if they can apply that knowledge in real life situations. Awards for the first three places are laptops which are allocated by the Government of Montenegro and the Ministry for Information Society.

For the competition winners, the Examination Centre set up seven day summer camps which were prepared by associates from the University of Montenegro, educational institutions and nongovernmental organizations in order to make young people interested in science.

In the Physics Camp (2008 and 2009) through lectures of prominent professors and scientists from EU, Russia, SAD, Japan, Israel, Serbia, Montenegro and other countries, talented pupils have the opportunity to learn not only about the most significant achievements, but topical (and unsolved) problems within the area of fundamental sciences as well.

The aim of the Camp of Biology and Chemistry (2008 and 2009) was to enable pupils to acquire additional knowledge and skills from the area of biology and chemistry, and to help them approach in direct and concrete manner techniques of sample collecting in nature and to provide them with the opportunity to gain first experimental research experience through the work in the laboratory and in the field.

Winners of the state contest participated in international contests in mathematics and sciences, such as the Second Regional Contest For Young Talents in Natural Sciences (Sofia 2008), International Mathematical Olympiad (Bremen 2009).

Within the organization of the Ministry of Education and Science and the Examination Centre, nine pupils-winners of the state contest in physics and mathematics, which took place in April 2007 and their two mentors visited the biggest European organization for nuclear research, CERN ("Conseil Europeen pour la Recherce Nucleaire") in Geneva.

The Ministry of Education and Science monitors European initiatives within the area of scientific education and tends to be included in the projects of FP7 programme, from the domain of the Science in Society, in order to incorporate good practice in teaching methodics, teacher training and innovative usage of teaching aids in its education system. There have not been any successful attempts within this area so far.

Science and technical faculties deal with the problem of small number of students by carrying out their own promoting and fostering measures through public presentations or scholarships in cooperation with the industry.

The Ministry of Education and Science started with the activities on popularization of science, by using European funds. In 2009 the Festival "Researchers` Night" will be realised for the first time in Montenegro. The Festival is financed through FP7 People Programme, in partnership with the Ministry and civil sector.

In the domain of Higher Education, topic of science in society appears in some subjects in natural sciences and mathematics and technical faculties (history and philosophy) as well as the Faculty of Economics (science, technology and entrepreneurship).

Certain objectives of greater interaction of science and society are realized through acting of NGO sector in this area, which is supported through state aid programme (general university fund, game of chance revenues or local authority) on the request of NGO sector.

Mobility of students and researchers was set up as an important objective in the work of the Ministry of Education and Science. Ministry initiated inclusion in several regional and European programmes which support mobility: CEEPUS, Tempus – including Erasmus Mundus and Erasmus Mundus External Cooperation Window[10], FP7. The Ministry delegated the University of Montenegro to submit project proposal in order to create European Centre for mobility of researchers within Euraxess network. Negotiations over this project will start in September 2009.

Scientific based governance

In Montenegrin administration there is established system of advisory bodies – Councils in almost

[10] More about these initiatives in Chapter 26

each administration authority, which regularly include representatives from science and research institutions. Scientific approach to problem issues which are to be decided upon should be ensured through participation of researchers in advisory process. Creation of numerous strategic and developmental documents is entrusted to research community, through advisory committees and work groups, bodies which have combined composition of researchers and representatives of line Ministries. Beside that, Montenegrin Academy of Sciences and Arts in cooperation with the Government of Montenegro coordinates multidisciplinary project of national importance "Montenegro in the 21st Century in the Era of Competitiveness". Project is being realized since 15 April 2009 on the basis of Memorandum on development of the document "Montenegro in the 21st Century in the Era of Competitiveness" which was signed by CANU and the Government of Montenegro. The aim of the project is to propose possible development directions of Montenegro in this century. Project lasts 15 months, and it is divided in ten subprojects and gathers over 150 associates.

In 2002 the Montenegrin Government formed National Council for Sustainable Development, as the support for realization of policy of development on the sustainability principles which are based on balance of economic, social, ecological, ethical and cultural dimension of development. Expert groups of this Council for social and economic development and environment mostly involve representatives of scientific institutions.

Considering structural and regular public dialogue on important and actual topics in science and new technologies, there is no well established practice in Montenegro, but there are *ad hoc* ativities which are initiated by the state administration, civil sector or media.

6. How is the respect of ethical standards being ensured: do you have regulations on ethics in conduct of science?

Respect of ethical standards in conducting science in Montenegro is prescribed by:

- the Constitution of Montenegro
- the Law on Scientific - Research Activities and
- the Ethical Code of Science and Research Institutions.

The Constitution of Montenegro in Chapter "Biomedicine" Article 27 stipulates that:

- the man's right and dignity of human beings are guaranteed regarding the application of biology and medicine;
- each intervention directed towards creation of human being that is genetically identical with other alive or dead human being is forbidden;
- it is prohibited to carry out medical and other experiments on human beings without his/her consent.

Article 3 paragraph 1 item 8 of the Law on Scientific - Research Activities, provides that scientific - research activities are based upon the principle of: ``ethics and responsibility of researchers who carry out scientific - research activities for the consequences of their work``.

Code of Academic Ethics at the University of Montenegro is adopted by the University Senate in 2004.

The Preamble of the Code item 5 lays down that: "tradition of the University is based upon results which are achieved through scientific objectivity and moral credibility, and contributes to overall mission in academic community and society as a whole".

Chapter I - *Professional Responsibility*, in items 1, 2, 6, 8, 12 and 13 the following principles are provided:

- Freedom of research and teaching process are the primary values of the University;

- Duty of academic staff is to respect ethical standards, principles of scientific truth and critical attitude and to protect reputation of the University through their work, acting and behaviour;
- Research and teaching activity at the University must be morally and intellectually independent from any other political authority and economic power;
- Duty of academic staff is to protect freedom of scientific - research and teaching work and to protect honour of their profession and they shall not abuse the authority of their profession for the purpose of personal or political interests;
- When a member of academic staff believes that he/she is requested to act opposite to his/her ethical principles or personal scientific and intellectual beliefs or consciousness, his/her duty is to initiate discussion about that topic;
- Academic staff are free to develop their original method of research and their own style of teaching.

Chapter III - *Responsibility toward Colleagues*, items 2 and 4, establishes the obligation of academic staff to foster culture of argumentative dialogue through their scientific works, public acting and mutual relations, as well as to respect individual and professional dignity of young colleagues and to take care of their teaching and scientific development.

Chapter V - *Social Mission,* item 2 stipulates that non-teaching activities of academic staff must not have a negative influence on the quality of teaching and scientific work.

In the last Chapter VI – *Application*, item 4 stipulates that the Court of Honour provides for responsibilities and declares measures for violation of ethical standards.

Financing of research

7. How are state funds allocated: please refer to the method and criteria used for the division of funds, sector priorities, regional priorities, private vs. public research.

The Ministry of Education and Science, as the line ministry, through the budget of which financial means for realization of scientific - research projects are allocated on competitive basis, in this moment is not facing the problem of setting up of thematic priorities toward which budget funds would be directed to a significant extent, because the intensity of scientific - research work is relatively low. Our science is in position to maintain its base of scientific potential through regular provision of financial means for research, alongside with provision of better conditions for the work of researchers, increase of their number and references. These conclusions are also indicated by the facts that only few results, financed from the budget means, were valorised, that ownership over project results was not regulated legally and that there was no real connection between the financed projects and real needs of Montenegro.

The current situation imposes priorities in the following areas on Montenegro:

- **Science and education –** In strategic documents of Montenegro, it is emphasised that science and education are assumptions of sustainable development and that they should be at the highest level of priorities of national policy and strategy of social, economic, scientific and technological and cultural development of Montenegro. Development of science implies recognition of the best researchers, promotion of scientific activities and enabling connection between science and education.
- Ours, as well as any other society in transition, is facing a number of specific problems which should be permanently studied in order to decrease their negative effects. **Natural and cultural heritage, demographic structure, national identity, language etc.** are the areas to which attention should be devoted.

- **Ecology –** Montenegro is declared as an ecological country, which is in accordance with its strategic documents, and with the strategic documents of almost each European country for which sustainability is the key term, and clean and unpolluted air, soil and water are fundamental priorities of development policy. Special importance is given to the sea and coastline, which in Mediterranean countries represent an important resource, and therefore are on priority position for studying and implementation of measures of protection and rational use of biological resources.
- **Tourism –** Work in the tourism area implies research in a number of areas which this economic branch predominantly depends on, such as: environmental protection, water supply system, waste waters, transport, communications etc.
- **Agriculture –** Development of sustainable sector of agriculture and food production is of crucial importance for the entire economic growth of Montenegro, having regard to the fact that food production contributes with more than 1/5 of GDP. Modern concept of sustainable development puts agriculture in much wider context because the overall importance is reflected in its multifunctionality. Development of agriculture at the same time implies huge resources management (37% of overall territory of Montenegro). Modern concept of agricultural development and agricultural policy consider development of agriculture and rural area as a unique entity. That integral approach includes forestry as important segment of natural resources management. Considering extremely strong competition and sequence of subventions which surrounding countries give for agricultural production, Montenegro can be competitive in relatively small number of agricultural products but there are significant potentials regarding healthy organic food.
- **Health of population** – Significant attention should be devoted to health problems which are typical for particular area or categories of population in Montenegro.
- **Energy -** Research within the area of energy recourses should be primarily directed towards research of energy potentials, renewable energy sources typical for Montenegro, as well as toward improvement of energy efficiency, having in mind that we are in that field among last countries in Europe.

The above mentioned areas should be taken in consideration whilst planning the annual investments of budget means, through line ministries, for programme co-financing of appropriate scientific and research institutions and realization of capital developmental projects from the mentioned areas with maximum engagement of national scientific human resources (Ministry of Agriculture, Forestry and Water Management, Ministry of Tourism, Ministry for Spatial Planning and Environment, Ministry of Culture, Sports and Media, Ministry of Energy, Ministry of Health, Ministry of Labour and Social Welfare, Ministry for Information Society). It is necessary to provide additional support of banking sector for the realization of research and developmental projects, in cooperation with the Ministry of Economy, and to create fostering conditions for foreign investments in research and development.

Regarding distribution of annual means for science, there is a problem of disproportional representation of different scientific areas in project proposals. Therefore, for the purpose of proportional development of all scientific areas, it is necessary to determine their mutual relation in distribution of financial means for fundamental research. So far, Montenegro did not apply any particular system of distribution of financial means per scientific areas. Future model which will be accepted in our country, is the one represented in the European Research System in Framework Programmes.

- Natural Sciences and Mathematics and Engineering – approximately 40%
- Life Sciences – approximately 35%
- Social Sciences and Humanities– approximately 15%
- Multidisciplinary Research – approximately 10%

Instead of setting up of thematic priorities, the Ministry of Education and Science will make a so called, functional list of priorities, i.e. define priority policies and measures devoted to removal of barriers and deficiency in research system and to fostering of its growth. Those are policies for stimulating of private – public partnership in research, setting up of balance between different sources of financing of research activities, improvement of conditions for attracting of foreign

investments in research and development and increase of number of students who enrol to the studies of engineering.

Private vs. public partnership in research has not existed so far, although Article 36 paragraph 2 of the Law on Scientific - Research Activities provides for a possibility that private and other legal and natural persons can gain means from the state budget, under condition of carrying out scientific - research program in accordance with the Strategy; their interest for applying with scientific - research projects in calls of the Ministry has not been expressed.

8. How is the evaluation of state funded research done: selection of evaluators? What are the criteria for funding? Is the use of public funding being monitored (statistics) and/or controlled?

In March 2005, the Ministry of Education and Science adopted the Rulebook on criteria for appointing experts and procedure of assessment of scientific - research projects by experts No. 314/05.

This Rulebook prescribes more precisely the criteria for appointing experts (reviewers) by the Ministry as well as the procedure of assessment of scientific - research projects.

The Ministry keeps a register of experts, for scientific areas, on the basis of references of researchers which the Ministry has in its data base.

Criteria for appointment of experts:

- Expert is a researcher with scientific or academic title and scientific references which qualify him/her for quality, impartial and objective assessment of researches from scientific areas which he/she researches;
- Expert is to have higher or at least the same scientific, or academic title as the manager of applied scientific and research project which he/she assesses;
- Expert can not be in conflict of interest referring to project he/she assesses;
- Expert can not assess project of which he/she is research manager as well as project in which he/she is member of research team.

Prior to the beginning of evaluation procedure of scientific-research projects by experts, formal relevancy of project applications is tested be the Ministry.

The Ministry, on the proposal of the Commission, by the means of individual decisions on appointment, appoints at least three experts from the scientific areas of submitted projects for the assessment of each scientific -research project which fulfils formal criteria.

Experts can be national researchers as well as researchers from abroad.

Identity of experts, as well as their assessment of scientific and research project are exclusively in cognition and possession of the Ministry and represent official secret, for the purpose of experts' protection and protection of their assessment and respect of principles of equity and objectivity during the assessment.

Criteria for assessment and financing of projects:

Experts individually evaluate scientific and research project on the basis of **criteria** which are quoted in the Model of Expert Project Evaluation which is component of the Rulebook, on the basis of:

a) insight into the state of research and matter of the project (actuality of the questions);
b) quality of the planned long-term project results (for entire period of research);
c) quality of the planned short-term results (for the first year of research);
d) assessment of expected results of research;
e) assessment of duration of research on the project, on the basis of goals and expected results;

f) assessment of available equipment of the institution for project realization and reality of equipment completion through purchasing or utilization of other institution equipment;
g) assessment of financial plan and manner of division of funds and
h) assessment of the project on the basis of researchers' references.

The last criterion is the sum assessment of the proposed project, with quoting total assessment.

Each of the above mentioned project criteria from the Pattern is individually assessed by marks 0 - 5.

If at least one criterion is assessed with minimal mark 0, project is eliminated from further procedure of assessing.

Positively evaluated projects are those which have 24 points at minimum. Maximal mark can be 40 points.

For positively evaluated projects the expert proposes ranking list on the basis of total mark by which he/she assessed each project individually. Expert submits his/her marks on scientific and research projects to the Ministry within ten day period from the day he/she received project for assessment. On the basis of all positive of the experts, the Commission composes a ranking list of project proposals for financing and submits it to the Ministry.

Minister adopts decision on acceptance for contracting and financing of the projects on the basis of available funds from the state budget. Integral part of the Decision is Annex – calculation of financial means for project realisation.

After expiry date for appeal, the Ministry, holder of scientific research and project manager conclude contract by which they regulate mutual rights and obligations.

Scientific and research projects are accepted for contracting for the period from two to three years, except for the projects which are linked to biological cycles for which realization period can be at the maximum five years.

Control of utilization of financial means for research realization is carried out by the Ministry on the basis of annual reports on work and expenditures which are submitted by the institutions – performers of scientific research for each project individually.

In this procedure, the Ministry does not keep statistical data on utilization of means for realization of research.

II. Framework programmes

EC Framework Programme

9. Please explain how research promotion under the Community research framework programme is organised in your country: within the Ministry? Which department? Any outsourcing to a Promotion office or Agency?

Research promotion under the Community research framework programme is organised only within the Montenegrin NCP system (National Contact Points system), without any outsourcing. The system includes 7 employees, three of them in the Ministry of Education and Science – Department for Science, Research and Technological Development, two at the University of Montenegro, one in the Directorate for Development of Small and Medium Sized Enterprises and one in the Office for International Scientific, Educational, Cultural and Technical Cooperation. The system is coordinated by the Ministry of Education and Science, and NCPs are divided per thematic priorities.

Promotion of the FP7 is realized through the following activities:

- organisation of Info Days about the important and currently open calls for proposals within the FP7;
- organisation of consultations and meetings with particular institutions;
- organisation of other promotional events;
- distribution of information books and posters, produced by DG RTD or by NCPs;
- communication with the media and notifications on the projects and activities of the FP7 which are worth recording;
- publishing of the texts in thematic on-line journals (EU Reporter, Euro Info Business News for Montenegrin entrepreneurs).

In addition to these, regular information through the mailing lists and specialized website *www.mneresearch.ac.me* is also provided.

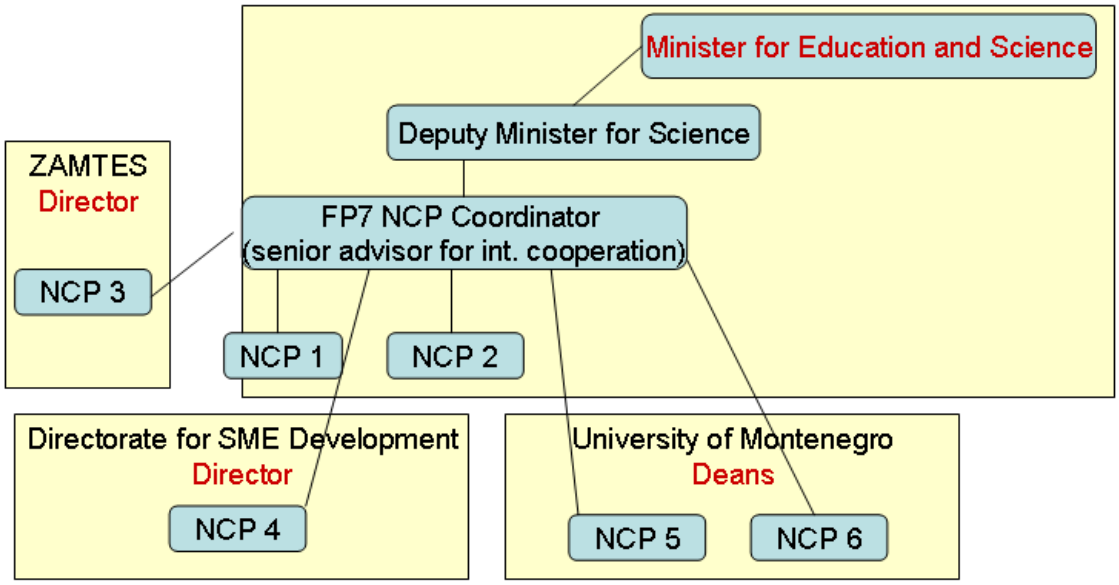
10. How often are Information Days organised? Do you have special measures to encourage research cooperation under the FP?

The objective has been set for the NCP to organise **at least 10 Info Days** per year, which was achieved throughout 2007-2008, and is also being realized in 2009. Some of the Info Days are comprised in the activities of the NCP within the International Cooperation project under the FP7.

The measures encouraging cooperation under the FP7 include support of the NCP and invited experts in the field of informing, search for partners and drawing-up of the project proposals. In addition to this, the Ministry of Education and Science offers, in accordance with the circumstances and the possibilities, a financial stimulation to the participants in the positively evaluated project proposals. In the period 2007 - 2008, this stimulation was reserved for partners in the project, for work package leaders and coordinators, whereas in 2009, due to the saving regime, it is reserved only for the coordinators.

11. What is the structure of the National Contact points and their relation with the Ministry and the national representatives in the management committees of the Framework programme?

Picture 1: Organisation chart of the NCP system in Montenegro



NCP Coordinator – People, Ideas

NCP1 - ICT, Research Infrastructure, Environment

NCP2 - Health, INCO, RegPot, Regions of Knowledge

NCP3 - Bio, SSH, Security, SiS.

NCP4 – SME

NCP5 - Energy

NCP6 - Transport

NCPs in Montenegro are appointed representatives of the Ministry of Education and Science for the participation as observers in the Programme Committees for the Seventh Framework Programme, along with the expert representatives who are appointed from the academic community. NCPs have regular communication with the professional representatives; they plan participation in the meetings of the committees, etc.

12. Explain your legislation regarding taxation and import duties concerning EC funds for RTD.

Article 41 of the Law on Scientific and Research Activities stipulates that “the equipment used in scientific and research activities which was received as a donation from a foreign country or purchased in a foreign country may be relieved from duty and value added tax on the basis of opinion provided by the Ministry.”

Apart from this, tax and customs duties reductions are also laid down in Article 25 paragraph 1 item 12 of the Law on Value Added Tax (Official Gazette of the Republic of Montenegro 65/01, 12/02 and 76/05) and in Article 184 paragraph 1 item 1 of the Customs Law (Official Gazette of the Republic of Montenegro 7/02, 38/02 and 72/02).

These provisions offer possibility for remission of value added taxes and customs duties on the basis of import of scientific equipment procured through the international agreements and treaties

registered in the Ministry of Foreign Affairs, having regard to the opinion of the Ministry of Education and Science.

Procedure for the remission of value added tax payment in the cases in which an international agreement or treaty provides that foreign donations cannot be used for tax payment in Montenegro is regulated by the Instructions for Implementation of Procedure Regarding the Right on Remission of Value Added Tax Payment When so Provided by an International Agreement or Treaty (Official Gazette of the Republic of Montenegro 34/03).

EURATOM Framework Programme

13. Is Montenegro engaged in nuclear research and how is it organised at national level: which Ministry is responsible for nuclear research?

There is no nuclear research at national level in Montenegro, and therefore, no ministry is responsible for nuclear research.

There are researchers at the University of Montenegro, at the Faculty of Natural Sciences and Mathematics – Department for Physics, who deal with the nuclear physics, particularly with the fields of gamma spectrometry and radiation protection. Other fields of nuclear research are performed by the physicist from this Faculty in the nuclear centres in Russia, Ukraine, Germany, Switzerland and Japan, in cooperation with the colleagues from these centres.

The Ministry of Education and Science co-finances scientific - research projects of the Faculty of Natural Sciences and Mathematics and in the fields of nuclear physics, thus co-financing, in cooperation with the University of Montenegro, a part of the costs of the researchers' stay in the above mentioned nuclear centres.

14. Any specific programmes and research institutes for nuclear research?

There are no special programmes or institutes for nuclear research in Montenegro.

In 2009, the Centre for Nuclear Knowledge and Competence was established at the University of Montenegro, comprising researchers from this University as its members.

15. Has Montenegro already participated in research projects under the Euratom FP?

Montenegro has not participated in research projects under the Euratom FP.

III. European Research Area

Investing in research

16. Describe the national strategy on the Lisbon objectives: is there an Action Plan on investment in research aiming at increasing investment in research?

Montenegro does not have an action plan on investment in research. However, the Action Plan of the Strategy sets the aim of increasing the investment in scientific and research activities up to 1.4% of the GDP by 2013.

Having regard to the Stabilization and Association Agreement, as well as general world trends in the globalization process, in which competitiveness of national economies becomes a basic factor of development of a society, the Government of Montenegro must be firm in its intention to develop Montenegro as scientifically and technologically oriented country. On the basis of the before mentioned Agreement and the Lisbon Strategy, the essential document of the EU on which the national strategies of the Member States are also based, Montenegro created the Strategy of Scientific and Research Activity with the aim of creating a knowledge based society. The knowledge based society must recognize the importance of education and scientific activities and it must rely on scientific and research institutions.

The main aim of the Strategy is to stimulate development of science and technology by bringing these factors into connection, as well as to foster their contribution to a development of the society in general, with the highest possible application of the new knowledge and with the creation of one's own competences and technologies.

In order to accomplish this task, the following objectives have been set and analyzed within the Strategy:

- to emphasize the importance of science and research within the context of a further socio-economic development and with the view of transforming the society into a modern knowledge-based environment;
- to offer to the Government of Montenegro an expert framework, recommendations and support with the aim of improving and creating conditions for scientific and research work, as well as to draw attention of the competent ministries to the inevitability and legitimate nature of the investment in science and research activities;
- to stimulate allocations for science and scientific infrastructure in accordance with the recommendations of the Lisbon Strategy and to propose a suitable dynamics of these allocations with regard to the GDP;
- to emphasize the invaluable role and crucial significance of the human resources for the development of science and technology, in particular through the development of young staff and their inclusion in the European Research Area (ERA);
- to stimulate technological development and innovation and to draw attention of the economic operators to the fact that their economic success depends on the acquisition and application of new knowledge, as well as on the quality of application and promotion of scientific results and development of new technologies the products of which are popular in the market;
- to give recommendations for optimization and possible reorganization of the institutional framework for the realization of scientific and research activities in order to reach a high level of efficiency;
- to emphasize the importance of Scientific Information System, as well as the role of Information and Communication Technologies (ICT);
- to encourage the creation of stimulating legal measures (taxation policy measures) and adoption of relevant regulations (e.g., intellectual property protection);
- to identify the most important areas of scientific and research work, bearing in mind the natural, technological and personnel comparative assets of Montenegro;

- to define by an appropriate Action Plan the areas of priority, as well as activities and methods of monitoring the realization of the adopted tasks.

The Strategy proposes dynamics of increase of investment in research, technological development and innovation for the period of five years: 2009-2013.

Graph: Proposal of increase of investment in SRA (Scientific and Research Activities) by 2013.

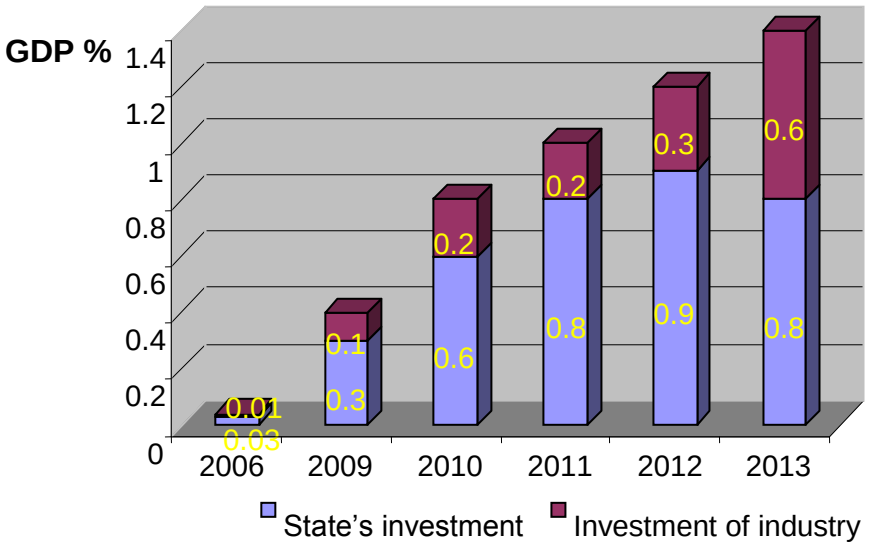


Table: Proposal of increase of investment in SRA (Scientific and Research Activities) by 2013

YEAR	2009	2010	2011	2012	2013
State's investment (% GDP)	0.1	0.2	0.2	0.3	0.6
Investment of industry (% GDP)	0.3	0.6	0.8	0.9	0.8
Total investment in RTD (% GDP)	0.4	0.8	1.0	1.2	1.4

17. Please provide quantitative information for your country, if possible for the period 2000-2008, including at least the following aspects:

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

YEAR	2002	2003	2004	2005	2006	2007	2008
Gross domestic expenditure on RTD	1.80	1.24	2.98	2.94	0.87	3.77	n/a
GDP	1360.10	1510.10	1669.80	1815.00	2148.90	2807.90	n/a
GDP %	0.13%	0.08%	0.18%	0.16%	0.04%	0.13%	n/a

The data are expressed in EUR million.
Source: MONSTAT (Statistical Office of Montenegro – Yearbook).
Note: These data do not comprise the expenditures of companies (business sector).

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

year	2002	2003	2004	2005	2006	2007	2008
Gross Government Expenditure on RTD	0.59	0.57	0.56	1.19	1.11	1.48	2.38
GDP %	0.044%	0.038%	0.034%	0.066%	0.052%	0.053%	n/a

The data are expressed in EUR million.
Source: Ministry of Education and Science, University of Montenegro, Montenegrin Academy of Sciences and Arts, Office for International Scientific, Educational, Cultural and Technical Cooperation.

Table: Overview of the allocation of funds of the Ministry of Education and Science for the period 2005-2008

Year	Total €	Science and Research (SR) projects (equipment included)	SR training/human development	International cooperation
2005	0.72	47.00%	46.40%	6.60%
2006	0.6	57.16%	27.67%	15.17%
2007	0.88	57.78%	22.00%	20.22%
2008	1.67	69.14%	17.25%	13.61%

The data are expressed in EUR million.
Source: Ministry of Education and Science of Montenegro.

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

Year	2002	2003	2004	2005	2006	2007	2008
Gross higher education expenditure	0.46	0.36	1.63	2.66	0.54	3.36	n/a
GDP %	0.03%	0.02%	0.10%	0.15%	0.03%	0.12%	n/a

The data are expressed in € million.
Source: MONSTAT (Statistical Office of Montenegro – Yearbook).
Note: These data comprise the expenditure of the faculties, including financing of the scientific and research activities by the Ministry of Education and Science.

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

The Ministry of Education and Science is not in the possession of data on the gross business enterprise expenditure on research and technological development (RTD). Moreover, none of the institutions that have been contacted keeps record of this. However, the statistics reform plan, which was drafted by the Ministry of Education and Science and MONSTAT (Statistic Office of Montenegro), will include these investments. After the reform is completed, MONSTAT will be in charge of the collection and filing of these data.

Year	2000-2008
Gross business enterprise expenditure	**n/a**

Note: MONSTAT, Ministry of Finance, Ministry of Economy, Agency for the Promotion of Foreign Investments and Central Bank of Montenegro, have been asked for the data.

On the basis of the balance sheet, the data of the Central Bank of Montenegro refer only to the intangible assets (licenses, franchise, patents, purchase of acquired *goodwill*, and other intangible assets), which also includes the expenditure on RTD that cannot be analytically extracted.

e) gross foreign investment in RTD.

There are no data on the gross foreign investments in research and technological development (RTD).

Year	2000-2008
Gross foreign investments in RTD	**n/a**

Note :MONSTAT, Ministry of Economy, Agency for the Promotion of Foreign Investments and the Central Bank of Montenegro, have been asked for the data.

18. How are RTD services to industry organised? Are there measures to facilitate venture capital?

The calls for proposals for co-financing of the scientific and research activities provide the researchers from industry with an opportunity to apply for the partnership in research projects with the research institutions.

This involves mainly the applied and developmental research, in which the participation of the industry consists of providing materials or services indispensable for the realization of the research. The Ministry co-finances the fees for the authors in research teams, as well as a part of the financial costs.

There are no measures to facilitate venture capital.

19. What are the financial or other incentives for RTD investment by state and private industry? What is the effectiveness of these incentives?

Through remissions of VAT (Value Added Tax) and import duties on scientific and research equipment, the State stimulates investments in research and technological development.

Article 41 of the Law on Scientific and Research Activity prescribes that: "the equipment used in scientific and research activities which was received as a donation from a foreign country or purchased in a foreign country may be relieved from customs duty and value added tax on the basis of opinion provided by the Ministry."

Apart from this, tax and customs duties reductions are also laid down in:

- Article 25 paragraph 1 item 12 of the Law on Value Added Tax (Official Gazette of the Republic of Montenegro 65/01, 12/02 and 76/05);
- Article 184 paragraph 1 item 1 of the Customs Law (Official Gazette of the Republic of Montenegro 7/02, 38/02 and 72/02);
- Article 2 of the Instruction of the Ministry of Finance on the manner of carrying out the procedure regarding the exercise of rights on remission of value added tax in cases when it is so provided for in an international agreement or treaty (Official Gazette of the Republic of Montenegro 34/03).

These provisions offer possibility for remission of value added taxes and customs duties on the basis of purchase of scientific equipment procured through the international agreements and treaties registered in the Ministry of Foreign Affairs, having regard to the opinion of the Ministry of Education and Science.

Human Capital building and Mobility of researchers

20. Which actions is your country taking to ensure that there are sufficient scientists? How are you attracting people to sciences? How do you ensure human resources capacity? Are there any special actions for science and women?

The Ministry of Education and Science, as a state administrative authority competent for the scientific and research activities, endeavours to ensure through various activities and programmes a scientific base necessary for the further development of science, as well as to set solid grounds for the knowledge-based society.[11]

In order to attract young people to sciences and a scientific career, many activities have been carried out both within the formal education as well as through the NGO sector activities. These activities and programmes include a wide population: from pupils in elementary schools to university students, engaging them in the regular subjects programmes, as well as in national competitions in different subject-matters, camps, visits to the great European and world research institutions.

[11] For further information on these activities see No. 5 of this Chapter.

The Ministry continually performs diverse activities that foster development of human resources in science (information days, workshops, seminars, training, etc.).

Among permanent activities of fostering development of human resources capacity, the Ministry co-finances the following through the regular annual calls:

- fees for master and doctoral studies, along with other forms of financial support regarding master and doctoral courses;
- programme for young researchers – engagement of students of doctoral studies in projects for the purpose of bringing doctoral thesis to the completion, or for the purpose of employment for the duration of three years;
- specialized trainings or scholars stays abroad;
- participation in international academic conferences abroad; and
- organization of conferences in the country.

Montenegrin Academy of Sciences and Arts (CANU) performs the following activities aiming at development of human resources:

- every second year, the Academy (CANU) award is given to talented and successful young scholars, researchers and artists;
- granting annual scholarships to the most successful students.

As far as special activities for science and women are concerned, there are no particular actions. There is a favourable proportion of genders' involvement within the scientific community. The percentage of women researchers in the overall number of researchers is high, approximately 50%, which is considerably above the EU average level.

21. Which actions has your country taken to ensure mobility of researchers?

Mobility of researchers and academic staff is within the competence of the Ministry of Education and Science and is realized through the work of two departments: Department for Science, Research and Technological Development and Department for Higher Education. It is often hard to make difference between researchers' and academic mobility.

The Ministry supports mobility of the researchers through the implementation of the bilateral agreements. The bilateral scheme ensures short-term stays (up to 14 days) and long-term stays (from 1 to 3 months).

One of the measures within the engagement of the doctoral candidates in projects is to enable their mobility, as a form of support to their training and career development.

Academically oriented programmes that are under the competence of the Ministry also envisage, through the new cicles, the ensuring of support for mobility of researchers. These programmes include: CEEPUS, TEMPUS and ERASMUS MUNDUS – External Cooperation Window[12] .

The competence of the Ministry includes scholarships of the foreign governments, the Ministry being the contact point for the activities that comprise: distribution of the information on calls for grants and scholarships, support for the application process and, in some cases, participation in the selection procedures.

The University of Montenegro, through the Office for International Cooperation, is in charge of providing administrative support for the numerous mobility programmes: DBU, DAAD, Coimbra Group Hospitality Scheme[13] .

ZAMTES (Office for International Scientific, Educational, Cultural and Technical Cooperation) offers financial support to both individuals and institutions for the participation in scientifically and

[12] For further information see Chapter 26.
[13] For further information on these programmes see Chapter 26.

research oriented conferences in the country and abroad (also for seminars, workshops, meetings, courses and training).

CANU (Montenegrin Academy of Sciences and Arts) ensures support for the mobility by granting scholarship to the talented students.[14]

The University of Montenegro finances specializations of the employees through specially designated fund for renewing of the personnel basis through the calls published twice a year.

Owing to the participation in various projects supported by the European Commission (FP6, FP7), Montenegro ensures mobility of researchers, whereas the establishing of the service centre for researchers, which will be connected to EURAXESS and facilitate the mobility in both directions, is also planned, for the upcoming period.

Mobility of researchers is also recognized by the Strategy on Scientific and Research Activity as one of the strategic choices and objectives. The Strategy acknowledges mobility as one of the important means in the process of development of human recourses capacity. This document lists basic obstacles and challenges, as well as recommendations and particular activities:

- on the level of institutions, the Action Plan attached to the Strategy sets out plan for the reorganization of the existing system of financing of the mobility of researchers, which would result in establishing a single legal entity, which will be competent for financing mobility. Deadline for this activity is 2012.

- as far as the particular recommendations and activities are concerned, the emphasis has been placed on the necessity of using all the mechanisms designed for the academic staff and doctoral students, in accordance with the teaching curricula at the University. Students of doctoral studies should be provided with the opportunity of spending at least one semester during their course at one of the foreign universities, for the purpose of which both the European and national funds should be used. It should also be ensured through the European and national funds that the holders of PhD titles, especially those of the age 27-34, spend maximum one semester working at one of the European universities on the basis of the 'unpaid leave' (this mechanism ensues from the recommendation of the countries fighting against the drain of the best researchers)

Moreover, NPI also sets mobility of researchers as one of the important objectives.

22. If there is a problem with regard to brain-drain of RTD personnel from your country, what are the possible government policies to address this matter? Are there any data on how many Montenegrin researchers are abroad and where?

As in other countries in the region, the problem of brain-drain appeared in the 1990s as a consequence of the general state in the region. Unfortunately, there are no precise data on the number of the Montenegrin scientists and researchers living abroad at present, partly because the existing data refer to the State Union of Serbia and Montenegro, without the exact information on how many scientists left Montenegro. It was estimated that approximately 50 Montenegrin scientists left the country in that period. Given the fact that the number of the scientists at the time was about 600, this equals 8.3% of the total number of researchers.

At present, there are no definite policies to prevent brain-drain of RTD personnel, neither to ensure conditions for the brain-gain (their return to the country). The Strategy on Scientific and Research Activity envisages, as one of the measures, providing of the conditions for PhD holders, in particular for those of the age of 27-34, to spend maximum one semester working at one of the European universities, on the basis of the 'unpaid leave', and with the help of the European and other funds.

[14] For further information on this measure see question 20 of this Chapter.

In order to reduce the brain-drain of RTD personnel, the University of Montenegro has solved the housing issue for all the PhD holders employed within the University, as one of the measures of the human resources policy. The process of building other residential buildings for the purpose of solving the housing issues of other employees of the University is ongoing.

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

The continuing training schemes are carried out by the following institutions:

1) Ministry of Education and Science;
2) Universities (faculties and research institutes);
3) Independent private faculties; and
4) Chamber of Commerce of Montenegro.

The **Ministry of Education and Science** finances engagement of doctoral students in research projects during their work on the PhD thesis. Project proposals are submitted by the institution and head of the project who is also responsible for the subsequent submissions of the annual reports on the doctoral student's work and performance. The student is obliged to defend his/her thesis within three years.

The existing **universities** in Montenegro, in accordance with the Law on Higher Education (Official Gazette of the Republic of Montenegro 60/03) and their official statutes, may organize within their regular activities, programmes of life-long learning apart from the study programmes for which they are accredited. Persons attending these programmes do not have student status. After they finish the programme, they obtain the related certificate.

The **Chamber of Commerce of Montenegro** performs various training schemes, according to the needs of the participants, on the wide range of subject matters regarding human recourses, management, project cycles management, etc. Target groups of these forms of education are managers, mostly managers in small and medium-sized enterprises. Recent experiences with these trainings point to the fact that persons with a higher education are more interested in attending these programmes than those with a lower one, being more aware that diverse forms of non-formal education become an important factor in the labour market in the modern society.

24. Please provide quantitative information for your country, if possible for the period 2000-2008, including at least the following aspects:

a) personnel (public/private RTD);

Calendar year [1)]	Number of researchers working full time					Number of researchers working part-time[2)]	External associates – researchers
	PhD holders	MA holders	Specialization	Higher education	**TOTAL:**		
2000	332	211	30	69	**642**	150	91
2001	327	214	33	52	**626**	63	133
2002	330	197	16	62	**605**	161	177
2003	316	186	7	93	**602**	175	201
2004	324	199	7	67	**597**	98	354
2005	345	216	10	62	**633**	162	314
2006	356	185	20	41	**602**	136	267
2007	382	215	17	57	**671**	151	302
2008	415	255	20	76	**766**	117	480

Source: MONSTAT (Statistics Office of Montenego) . The research of the MONSTAT includes mostly higher education institutions. The participation of research and developmment units is inconsequential.

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

Year	Graduates				
	Mathematics and Natural Sciences	Technical and Technological Sciences	Humanities and Social Sciences	Medical sciences	**TOTAL:**
2000	151	173	529	26	**879**
2001	169	196	641	19	**1 025**
2002	331	189	733	21	**1 274**
2003	250	171	817	33	**1 271**
2004	199	279	951	27	**1 456**

2005	246	254	1 070	86	**1 656**
2006	412	302	1 080	73	**1 867**
2007	221	202	1 868	98	**2 389**

Source: MONSTAT (Statistics Office of Montenegro); these data include information on graduate students from high schools and academies.

Academic year	Undergraduate students			Postgraduate and doctoral students		
	State university	Private universities and faculties	**TOTAL:**	State university	Private universities and faculties	**TOTAL:**
2000/2001	8 271	-	**8271**	n.a	-	n.a
2001/2002	7 878	-	**7 878**	n.a	-	n.a
2002/2003	8 333	-	**8 333**	n.a	-	n.a
2003/2004	9 759	-	**9 759**	n.a	-	n.a
2004/2005	10 942	69	**11 011**	n.a	-	n.a
2005/2006	12 199	704	**12 903**	n.a	-	**n.a**
2006/2007	14 886	1 287	**16 173**	1 115	-	**1 115**
2007/2008	15 296	2 713	**18 009**	1 355	86	**1 441**
2008/2009	16 567	3 923	**20 490**	2 063	272	**2 335**

Source: MONSTAT (Statistics Office of Montenegro); The data on the students enrolled in the postgraduate (specialized and master) studies, as well as doctoral studies have been filed for the last two years – in accordance with the new Law on Higher Education.

Organisation of research on specific areas

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

Montenegro does not have special research programmes and funding on coal and steel.

26. Is your country having special measures to engage on research on Food, Agriculture and Biotechnologies and measures to ensure the proper use of biotechnologies? Any Action Plan?

Montenegro does not have special programmes or Action Plans for the research on food, agriculture and biotechnologies.

Projects in the above mentioned areas are financed by the Ministry of Education and Science, on the competitive basis through the calls for co-financing science and research activities, as well as by the Ministry of Agriculture, Forestry and Water Management, in accordance with the current needs.

Stimulation of the researches on food, agriculture and biotechnologies are envisaged by three national documents. These are:

Strategy on the Scientific and Research Activity of Montenegro (2008-2016) – it contains several areas of priority for the development of science and research activities: science and education, ecology, tourism, agriculture, health of the citizens and energy. The Strategy emphasizes that the development of sustainable sector in agriculture and food production is of the crucial importance for the entire economic development of Montenegro, given the fact that the contribution of food production to the GDP exceeds 1/5 (one fifth) and that the concept of sustainable development of agriculture is based on its multifunctionality. It is also stressed that the development of agriculture implies enormous land resources management (37% of the total area of Montenegro). In addition to this, the need for the development of organic agriculture, for which there are considerable potentials, has also been emphasized.

Strategy on Food Production and Rural Areas Development, which was adopted in the middle of 2006, points to the importance of research and institutions engaged in research on agriculture, with a special emphasis on the necessity to adjust the research to the further development and to the aim of responding to numerous challenges confronting the agriculture today.

National Programme for the Food Production and Rural Areas Development 2009 – 2013, this is a document that elaborates the agricultural policy ensuing from the Strategy, within the so-called 'third pillar of support' (support to the general services in agriculture) and it contains special measure for education, research, development and analyses. Among the reasons for implementation of the measure, it was indicated that the reforms and adjustment to the EU Common Agricultural Policy impose a greater need for the strong institutional support to the growth of personnel and research and developmental function, having in mind that Montenegro is deficient in research-and-development sector. NP therefore envisages offering of the support for the education and training of the deficient personnel in agriculture, support for targeted research and development projects and economic analyses in agriculture, with the aim of founding the agricultural development on knowledge, as well as of strengthening the institutional support, carrying out the process of reforms and association to the EU faster. This measure entails the increase of the budget from 300 000 euro in 2009 to 520 000 euro in 2013.

There is a proper use of biotechnologies, i.e. genetically modified organisms in our country, prescribed by the Law on Food Safety (Official Gazette of Montenegro 14/07) and the Law on Genetically Modified Organisms (Official Gazette of Montenegro 22/08).

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

The Ministry of Education and Science has not financed military RTD in the report period. According to the data provided by the Ministry of Defense, the research and development programmes for the military purposes are carried out in the factories of defense industry which are not owned by the State.

I. The research and development programmes in defense industry of Montenegro started in 2000. So far it has been invested 1,805,000.00 euro.
II. Since 2000, it has been invested 2,605,000.00 euro in the programme of conversion of defense industry.

28. Are you having Actions or special programmes to foster research on specific topics such as clean sky? Innovative medicines? Energy efficiency?

Since 2007, the Directorate for Development of Small and Medium Sized Enterprises has been implementing the **Programme for Energy Efficiency and Renewable Energy Sources**, financed partly by the KfW – German Development Bank, and partly by the German Government. Credit funds for the enterprises have been allocated for the following projects: rationalization of the energy consumption in enterprises through the principles of energy efficiency, usage of the renewable energy sources, protection of the environment – the greenhouse effect and UV radiation reduction. The objective of these projects is to increase competitiveness of small and medium sized enterprises, as well as to use "clean" technologies. The allocated funds of 17 million euros are transferred through the CKB (Montenegrin Commercial Bank).

The Ministry of Education and Science does not have any special programmes to foster research in the above mentioned fields.

The Strategy on Scientific and Research Activity specifies energy as one of the areas of priority. In addition to this, it was established that the research in the field of energy should be directed towards exploring energy potential, renewable energy sources and energy efficiency improvement.

29. Any special interest in participating in the Articles 169 and 171 initiatives taken at EC level?

Due to its very recent association to the Seventh Framework Programme (2008), Montenegro has not yet been included in the existing initiatives laid down in Article 169 of the EU Treaty. However, there is a very successful cooperation and a high level of commitment among decision-making bodies, which is recognized in the user community, within the ERA NET schemes (SEE ERA NET and SEE ERA NET + SEERA-EI of the Ministry of Education and Science). Since 2009 another administrative body, the Ministry of Agriculture, Forestry and Water Management has been included as an associate partner in Wood Wisdom ERA NET. We expect that this cooperation will be continued, encouraged and improved, giving rise to the initiatives from the Article 169, and that by being included more intensively in the CREST, Montenegro will be able to provide a greater contribution to these efforts.

Montenegro still does not have research centres of excellence, nor the highly competitive enterprises on the European level. Moreover, there are no industry associations such as national technology platforms. Within the regional cooperation, Montenegro endeavours to contribute to the forming of regional technology platforms which would facilitate inclusion in the Joint Technology Platforms, created on the basis of the Article 171 of the EU Treaty.

International cooperation on Research

30. What is the current experience of your country with international RTD cooperation other than EU programmes?

The international RTD cooperation, other than EU programmes, is performed through bilateral, regional and multilateral cooperation.

The bilateral RTD cooperation is carried out on the basis of the signed bilateral treaties, programmes and other acts. Countries with which Montenegro has signed treaties on scientific and research cooperation include: Slovenia, Bosnia and Herzegovina, Albania, Croatia and Austria.

Multilateral RTD Cooperation. At the end of June 2006, Montenegro became 192nd Member State of the UN, and at the end of October of the same year it renewed, as an independent and sovereign state, the full membership in the International Atomic Energy Agency from Vienna.

As a member state of the UN, Montenegro has a successful cooperation with the United Nations specialized agencies.

In cooperation with the Regional Bureau for Science and Culture in Europe (UNESCO BRESCE), in July 2008 the Ministry organized a forum called *"SOUTH EASTERN EUROPE HIGHER EDUCATION, SCIENCE AND INNOVATION POLICY FORUM"* in Montenegro.

The most important segment of the cooperation with the Agency from Vienna is certainly the technical cooperation realized through the cycles of technical support to the Member States, which is most frequently realized for the duration of two years, the support being provided through national, regional or sub-regional projects.

The first three-year cycle of technical support for the period 2009-2011 is ongoing. It officially started on 1 January 2009 and it will last until 31 December 2011.

Further information on the projects is provided in the Introduction (Research Policy).

As a partner country, Montenegro has been included in the **NATO Science for Peace and Security** programme since 2007, and it has its representatives in the Committee. The priorities of Montenegro in this Programme are the following:

- Information safety;
- Environment protection;
- Socio-economic sciences and humanities; and
- Biotechnology.

Realization of an international project titled "Harmonization of the Seismic Hazard Maps in the Western Balkans Countries", coordinated by the Seismological Office of Montenegro, is ongoing.

As far as the regional scientific and research programmes are concerned, Montenegro takes part in the Adriatic-Ionian Initiative and Central European Initiative.

Through the IPA programme, the following cooperation programmes, offering among other things a support for scientific and research activities, became available to Montenegro:

- Programmes of cross-boarder cooperation with Albania, Croatia, Bosnia and Herzegovina and Serbia.
- MED Programme,
- SEE Programme, and
- Adriatic Programme.

CANU (Montenegrin Academy of Sciences and Arts) participates in numerous projects, within its bilateral cooperation with the academies of sciences and other scientific institutions form Europe and the rest of the world.[15] Furthermore, the Academy participates in many activities as a member of 8 international academic associations (The Central- and Eastern Europe Network of Academies – CEEN, All European Academies - Federation of National Academies of Sciences and Humanities – ALLEA, International Union of National Academies – IUA, to list a few). In addition to this, CANU partakes in the organization of international conferences (in the organization of CANU and InterAcademy Panel, National Academies of Sciences from Central and South Eastern Europe - CEEN, European Academy of Sciences and Arts - EASA, World Academy of Art and Science – South East European Division -SEED of WAAS, Inter Academy Council of South-East Europe - IACSEE, an international conference *The Role of National Academies in 21st Century* was held in the period 9-12 October 2008 in Montenegro. There were 80 participants from over 30 countries).

In addition to the activities within the FP7 and activities on the implementation of bilateral agreements in the field of RTD cooperation, which it performs together with the Ministry of Education and Science, **ZAMTES** (Agency for International Scientific, Educational, Cultural and

[15] Bilateral agreements of CANU can be found in question 32 of this Chapter.

Technical Cooperation) is conducting the programme of integrated activities “Pelican“, which was signed in 2003, also as a co-financing project. Moreover, ZAMTES is a partner-institution for the cooperation with the International Atomic Energy Agency (IAEA).

CEI (Science, Technology and Human Recourses Development) – Montenegro is following of the activities envisaged in the CEI Plan of Action and using the possibility of inclusion of our institutions by means of proposals of particular projects.

31. Do you have a strategy for the conduct of international cooperation on research: criteria/reference with whom and/or on what to engage in research? Priorities?

At present, there is no special strategy for the conduct of international cooperation on research. However, the Strategy on Scientific and Research Activity contains a specific chapter referring to the international cooperation, which provides the list of the following conclusions and recommendations:

- The measures referring to the exchange of information in a decision-making process, technology transfer and the exchange of results can have a positive effect on the internationalization of national programmes. These effects would stimulate the international cooperation through the contacts within the financedl projects in different countries, as well as mobility of researchers as an essential condition for creating a successful international cooperation.
- In order to stimulate an international cooperation of a larger scale in Montenegro, it is necessary to undertake a series of specific measures in order to form the infrastructure necessary for fostering of international cooperation and taking part in the European Research Area.
- Participation of researchers in the relevant European and international programmes should be strongly encouraged through the increase of funds designated for their mobility.
- The system of financing, control and flow of information on international cooperation should be unified at the national level within a single legal entity that must keep a neat data base on all participants in international cooperation activities. It is necessary to complete contact point network for different thematic fields within the Seventh Framework Programme, as well as in other international programmes.
- Researchers should be timely and systematically informed about all the calls and the requirements for the applications, and above all, for all the calls regarding the Framework Programme, through national contact points.
- The entrance of Montenegro in the EUREKA programme should be accelerated, since at the international level this programme encourages involvement of industry and private sector in the system of financing scientific and research activities.
- The participation in the COST programme should be promoted through the suitable administrative mechanisms, which are not yet developed in Montenegro, as well as through more widely spread informing of academic circles at large about the possibilities offered by the COST.
- The existing bilateral cooperation should be extended, being one of the most popular experiences in the exchange of scientific and research results. Also, the intensive activities on establishing a more extensive multilateral cooperation should be initiated.
- Regional cooperation should be intensified, since it offers numerous possibilities for joint research projects relevant for the whole region, with a comparatively equal level of scientific and research activities.
- It is necessary to create a better and more strongly connected network between Montenegrin scientific and research organisations and other national and European agencies that promote science and research, as well as their financial organisations, in order to foster and improve cross-borders activities.

Most of these recommendations are part of the Action Plan of the Strategy.

During the last several years, and in accordance with the recommendations from the Thessalonica Action Plan, there have been numerous initiatives aiming at improvement of the international cooperation in the Western Balkans and at connection of this regions with the countries of the EU (SEE-ERA.NET, SEE-ERA.NET plus, ERA-WESTBALKAN, ERA-WESTBALKAN plus, WBC-INCO.NET, the projects aiming to create a network of National Contact points for specific fields of the FP7), the final objective of all of them being the integration of the region into the European Research Area through the networking of the ministries competent for science, as well as through the support for the coordination of research policies between the region and the EU. Montenegro is an active participant in these initiatives (the partners in which are the **Ministry of Education and Science** and **ZAMTES**).

As far as the joint activities on strategic planning are concerned, Montenegro is an active participant in the initiative dedicated to building a project of **joint Western Balkans Strategy on Research and Development for Innovation**, which will greatly contribute to the further integration of Montenegro and the whole region into the European Research Area, and furthermore, it will contribute to the development of science in Montenegro due to the exchange of experience and good practice with the colleagues form the region and the EU.

Montenegro also partakes in the **Steering Platform on Research for the Western Balkan Countries**, as well as in many other **international committees and forums** (ESFRI, JRC Government Board, CREST, SCAR, ESBN).

FP7 and fostering of the participation in all its sub-programmes is certainly one of the strategic priorities. Along with frequent activities of the promotion, dissemination and consultations regarding the currently open calls for the programmes, the Ministry of Education and Science also ensures a financial help for the participation in the programme.[16]

Specific **priorities** of the cooperation are defined in relation to the type of the international agreement (whether international, multilateral) and the relevant accompanying programmes.

32. Can you list your international agreements on Science & Technology?

Since the independence, the Government of Montenegro has signed, through the **Ministry of Education and Science**, the agreements on scientific and technologic cooperation with the following countries:

- the Republic of Slovenia, 2 July 2008,
- Federation of Bosnia and Herzegovina, 1 December 2008,
- the Republic of Albania, 16 December 2008,
- the Republic of Croatia, 26. January 2009, and
- the Republic of Austria, 10. June 2009.

Bilateral agreement with the Republic of Serbia was adopted by the national governments and the procedure of signing is forthcoming.[17]

Montenegrin Academy of Sciences and Arts, on the basis of bilateral agreements, cooperates with numerous academies of sciences and various scientific institutions. These are:

- Albanian Academy of Sciences;
- National Academy of Sciences of Belarus;
- Bulgarian Academy of Sciences;
- Academy of Sciences of Bosnia and Herzegovina;
- Czech Academy of Sciences;
- Hungarian Academy of Sciences;

[16] For further information on the above mentioned activities see the introductory part of this Chapter and Part *II Framework programmes.*

[17] For further information on bilateral agreements see the introductory part to Chapter 25.

- Macedonian Academy of Sciences and Arts;
- Rumanian Academy;
- Russian Academy of Sciences;
- Slovakian Academy of Sciences;
- Slovenian Academy of Sciences and Arts;
- Serbian Academy of Sciences and Arts;
- Turkish Academy of Sciences;
- Estonian Academy of Sciences;
- Latvian Academy of Sciences;
- Moldavian Academy of Sciences;
- National Academy of Sciences of Ukraine;
- National Academy of Lincei (Italy);
- Academy of Sciences and Arts of the Republic of Srpska;
- Georgian National Academy of Sciences;
- Chinese Academy of Social Sciences;
- Polish Academy of Sciences;
- Lithuanian Academy of Sciences;
- Royal Academy of Economic Sciences (Spain);
- British School in Rome;
- Institute for Archaeology of the University "Carlo Bo" (Urbino-Italy); and
- Bio-politics International Organisation (Greece).

The University of Montenegro has also signed many agreements with the universities from Europe and the whole world. These are the following:

- Albania: the University of Tirana and the University of Scutary "Luigj Gurakuqi";
- Austria: the University of Klagenfurt;
- Australia: Charles Sturt University "CSU";
- Bosnia and Herzegovina: the University of Banja Luka, the University of Sarajevo, the University in Zenica;
- France: Le Centre International d'etude Pedagogiques – Sevres; Université Marc Bloch - Strasbourg II; Nice Sophia Antipolis University; National Polytechnic Institute; University in Tours; Ecole Nationale Superiure des Ingenieurs des Etudes et Techniques d'armement – France (« ENSIETA »), Brest;
- Italy: the University of Trieste, University in Bari, the University of Polytechnics in Bari, the University of Lecce, the University of Foggia, university "La Sapienza" in Rome, the University of Pescara, University d'Aquilla, the University in Milano, UNIADRION – the Virtual University of the Adriatic-Ionian Basin;
- Canada: the University of Québec in Montréal, the University of Ottawa;
- Macedonia: the University of Skopje, University "Sv. Kliment Ohridski" – Bitola;
- Germany: the University Trier, German Academic Exchange Service (DAAD), Research Centre Deutsches Elektronen-Synchrotron DESY, University of Applied Sciences – Bonn;
- Norway: the University of Oslo, Norwegian Institute for Life Sciences, the University of Bergen;
- Poland: the University of Warsaw, Krakow University of Economics;
- Russia: Lomonosov Moscow State University, Saint Petersburg State University – Faculty of Pedagogy;
- Ukraine: Royal Slovenian University – Taras Shevchenko;
- USA: George Mason University, University of California – Davis campus, Florida State University;
- Slovakia: Slovakian University of Technology in Bratislava;
- Slovenia: the University of Ljubljana and Nova Gorica Polytechnics;
- Serbia: the University of Belgrade;
- Spain: the University of Granada;
- Great Britain: London Research Academy;
- Israel: the University of Negev;
- Sweden: Jönköping University;

- Romania: University Agora; and
- Czech Republic: University Pardubice.[18]

University "Mediteran" has signed, within its bilateral cooperation, the agreements with the following universities:

- University 'Singidunum' – the Republic of Serbia;
- Megatrend University – the Republic of Serbia;
- University of Niš – the Republic of Serbia;
- University of Ljubljana – the Republic of Slovenia;
- University 'Goce Delčev' – the Republic of Macedonia;
- University of Banja Luka –Republika Srpska;
- University 'Džemal Bijedić' – Bosnia and Herzegovina;
- West Coast University – Panama;
- University of Bari – Italy;
- University of Debrecen – Hungary; and
- International Independent University of Environmental and Political Sciences, Moscow – Russian Federation.

It has also signed agreements with the following faculties, academies and institutes:

- Faculty of Philology, University of Belgrade – the Republic of Serbia;
- IFAM business school – France;
- Faculty of Administrative and European Studies – Podgorica;
- Institute of Economic Sciences, Belgrade – the Republic of Serbia;
- M.A.I – Moscow Aviation Institute – Russian Federation;
- Academy of Diplomacy and Security, Belgrade – the Republic of Serbia;
- Belgrade Banking Academy – the Republic of Serbia; and
- Uniadrion – the Executive Secretariat – Italy.

33. Do you participate in the Strategic Framework for International Sciences and Technology cooperation established under the CREST?

Montenegro participates in the activities under the Strategic Framework for International Sciences and Technology cooperation established under the CREST.

Montenegro has been a member of the Steering Platform for Research in the Western Balkans Countries ever since it was established in June 2006. Our participants actively partake in its work. The Ministry of Education and Science has also participated in the WBC INCO NET project since the beginning of its work on 1 January 2008.

The Montenegrin Research and Education Network (MREN) participates in the crucial initiatives connected to establishing of the framework IT conditions for international science and technology cooperation (SEEREN, SEE-GRID, SEE-GRID-SCI, SEERA-EI). These projects represent a great facilitation to the academic network development and enhance connection of Montenegro with the GEANT (Europe's academic network).

The conditions for the mobility of researchers in Montenegro have been improved, and are expected to be additionally enhanced by the announced visa liberalization for the Montenegrin citizens, i.e. abolishment of visas for the Schengen area (Recommendation of the EC to the Council of Ministers EU, July 2009). The Ministry of Education and Science delegated the University of Montenegro to be the Bridgehead Organisation for establishing of the European Researchers Mobility Centre through Euraxess call for projects under the FP7 People programme. The negotiations are due to end in October 2009. In addition to this, there are other activities

[18] For further information on these agreements visit: http://www.ir.ac.me/zemlje%20saradnje.html

aiming at enhancement of the mobility of researchers through CEEPUS, Tempus, Erasmus Mundus and other international cooperation programmes.

Following the association to the Seventh Framework Programme, Montenegro appointed a representative in the CREST in June 2008.