

**Montenegro Higher Education and Research For Innovation
and Competitiveness (HERIC) Project**

Environmental Management Framework
in the context of the Higher Education and Research For
Innovation and Competitiveness (HERIC) Project

Final

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Abbreviations

BES	Bureau for Education Service
CoE	Center of Excellence
CEE	Central and Eastern Europe Region
CPS	Country Partnership Strategy
EA	Environmental Assessment
ECA	Europe and Central Asia Region
ECB	European Central Bank
EC	European Commission
ECTS	European Credit Transfer and Accumulation System
EMF	Environmental Management Framework
EMP	Environmental Management Plan
ENQA	European Association for Quality Assurance in Higher Education
EPA	Environmental Protection Agency
EQAR	European Quality Assurance Register for Higher Education
EU	European Union
FAO	Food and Agricultural Organization
FDI	Foreign Direct Investments
GDP	Gross Domestic Product
GoM	Government of Montenegro
GPN	General Procurement Notice
HERIC	Higher Education and Research for Innovation and Competitiveness Project
ICB	International Competitive Bidding
IFAC	International Federation of Accountants
IFC	International Finance Corporation (of the World Bank Group)
IFR	Interim Unaudited Financial Reports
IPA	Instrument for Pre-Accession Assistance
ISA	International Standards on Auditing
MoES	Ministry of Education and Sports of Montenegro
MERP	Montenegro Education Reform Project
M&E	Monitoring and Evaluation
MoF	Ministry of Finance of Montenegro
MoS	Ministry of Science of Montenegro
MONSTAT	Statistical Institute of Montenegro
MoU	Memorandum of Understanding
MTE	Ministry of Tourism and Environment
NCB	National Competitive Bidding
NQF	National Qualifications Framework
PDO	Project Development Objective
PEFA	Public Expenditure and Financial Accountability
PISA	Programme for International Student Assessment
PMT	Project Management Team
POM	Project Operations Manual
PSC	Project Steering Committee
QA	Quality Assurance
QCBS	Quality and Cost-Based Selection

R&D	Research and Development
SAA	Stabilization and Association Agreement
SBD	Standard Bidding Documents
SoE	Statement of Expenditure
SIL	Specific Investment Loan
SME	Small and Medium Enterprises
SPN	Specific Procurement Notice
STI	Science, Technology and Innovation
ToR	Terms of Reference
TSU	Technical Services Unit
UCG	University of Montenegro (<i>Univerzitet Crne Gore</i>)
UDG	University Donja Gorica
UM	Mediterranean University (<i>Univerzitet Mediteran</i>)
WB	World Bank

Executive Summary

This Environmental Management Framework (EMF) describes procedures that the Ministry of Science (MoS) will have in place during implementation of the Montenegro Higher Education and Research for Innovation and Competitiveness (HERIC) Project in order to meet World Bank and Government of Montenegro requirements regarding environmental safeguards. The purpose of this framework is to outline HERIC policies and processes and delineate beneficiaries' obligations in screening and categorizing proposed activities according to their possible environmental impact, mitigating the risks, and defining HERIC monitoring activities.

This Report also includes an Environmental Analysis for the overall project and templates for the Environmental Screening and Environmental Management Plan (EMP) to be prepared by project beneficiaries. These documents have been prepared by the Ministry of Science in line with the World Bank Operational Policy/ Bank Procedure 4.01 and relevant national legislation.

The Government of Montenegro (GoM)/ Ministry of Science (MoS) and Ministry of Education and Sports of Montenegro (MoES) have requested World Bank support in the areas of higher education and research and innovation, with the twin objectives of increasing potential growth and increasing international competitiveness. The World Bank-funded HERIC Project is being developed as a vehicle to deliver the requested assistance, with an objective of strengthening the quality and relevance of higher education, research, and innovation in Montenegro. The partnership between the MoS, MoES and the World Bank can provide the large-scale leverages needed to transform higher education, research, and innovation into mainstream economic drivers for Montenegro. This will support Montenegro as it moves closer to EU accession, by helping the GoM develop the capacity to meet the EU Acquis standards in the areas of enterprise, industrial policy, and science and research, and to align the economic directions with the priorities expressed in the *Europe 2020 Strategy*. The project comprises four components:

Component 1 – Higher Education Finance Reforms and Implementation of Quality Assurance Norms (Bank financing: US\$6.75 million)

Component 2 – Human Capital Development through Internationalization Initiatives (Bank financing: US\$2 million)

Component 3 – Establishing a Competitive Research and Innovation Environment (Bank financing: US\$10 million)

Component 4 – Project Management and Monitoring and Evaluation (Bank financing: US\$0.8 million)

The Project is classified as a World Bank environmental Category B project, requiring partial Environmental Analysis, but not a full-scale Environmental Assessment. The main conclusion of the conducted environmental analysis is that potential adverse environmental impacts of the project are minor, and that there are no significant, long-lasting and irreversible negative impacts associated with project implementation. In cases where negative environmental impacts have been identified, adequate mitigation

measures are proposed. Since the specific types and locations of activities (Center of Excellence (CoE), research grants, student hostel renovations) are not known prior to implementation of HERIC, an Environmental Management Framework has been prepared to provide guidance to ensure compliance with World Bank and GoM environmental requirements.

While the exact types of research to be supported are not determined at present, it can be anticipated that the CoE and research grants could include electrical engineering, marine sciences, oenology, medicine and/or social sciences. The key environmental safeguard issues that could be associated with the project are: (i) medical facility and laboratory safety and safe disposal of wastes; (ii) agricultural pest management; and (iii) potential environmental issues arising in connection with the renovation of existing laboratory space and student hostels (existing buildings). Hence the project has been screened and assigned a Category B status.

Potential adverse environmental impacts have been identified for the following project activities under Component 2 Human Capital Development through Internationalization Initiatives and Component 3, Establishing a Competitive Research and Innovation Environment:

1. (Component 2) Up to 10 state-owned student hostels may be upgraded and modernized, to include renovations to toilets, doors, windows, and other internal infrastructure. This would involve minor civil works impact management.
2. (Component 3) Pilot Center of Excellence (CoE) in scientific research to upgrade Montenegro's science and technology infrastructure in areas where the scientific and economic potential are highest. The pilot CoE to be supported by the Project would be selected through a competitive process, would be equipped with state-of-the-art specialized scientific equipment and pilot plant facilities, and would adopt world-class laboratory management practices and environmental standards. The CoE could involve laboratory biosafety, pest management, laboratory or medical waste management, and minor civil works issues.
3. (Component 3) Competitive grants program for medium to large scale R&D activities that can lead to international collaboration and generate commercial innovations. The grants would be awarded to researchers in Montenegrin research institutions or firms that apply to initiate a programmatic R&D "subproject" together with an international partner. The grantees would be selected through calls for proposals administered by the MoS. A committee of international experts would evaluate the subprojects based on several criteria, including the quality of the proposals, the capacity of the domestic and international sponsors and the expected scientific and technological results. The grant for each subproject is expected to be €300,000 – €500,000 for a period of up to three years. As with the CoE, the sub-projects could involve laboratory biosafety, pest management, laboratory or medical waste management, and minor civil works issues.

The potential environmental impact of the CoE and grant sub-projects will be assessed through a screening procedure based on the WB Environmental Assessment safeguard policy (OP/BP/GP 4.01 on Environmental Assessment), WB Pollution Prevention and Abatement Handbook (PPAH) and the relevant laws and bylaws of the GoM, in particular the *Waste Management Law* (Official Gazette of the RM, No. 80/05), and the *Law on Integrated Prevention and Pollution Control (IPPC)* (Official Gazette of the RM No 80/05). The environmental screening procedure outlined in this EMF will become an integrated part of the Grants Operational Manual. When the screening procedure indicates that environmental impacts may occur, a specific Environmental Management Plan (EMP) will be developed for the object (CoE, research grant sub-project, student hostels). The EMP will identify mitigation measures recommended for the assessed adverse environmental impacts.

Monitoring and compliance with findings of this Report and requirements of related EMPs, including progress monitoring on EMPs implementation, will be undertaken by MoS at least twice per year. The environmental monitoring and supervision reports will be also prepared twice per year. Those will be submitted to the World Bank for review and endorsement.

1 Introduction

In its Economic and Fiscal Program 2012–15, the Ministry of Finance of Montenegro recognized the critical importance of devising prudent fiscal policies over a longer-term horizon so as to ensure their sustainability over different phases of the business cycle. In light of the limited effectiveness of standard macroeconomic policy instruments, the GoM must consider putting a greater emphasis on microeconomic or structural reforms, for the aforementioned economic reasons as well as for EU integration-related ones. Otherwise, Montenegro (population est. 623,000) risks suffering from sustained periods of economic stagnation, rising rates of unemployment, and increasing poverty, either gradually, because companies face increasing difficulty in competing successfully in domestic and foreign markets, or in the wake of an acute fiscal or balance-of-payment crisis.

Following Montenegro's decision to adopt the euro as its only legal tender, growth can neither be stimulated by exchange rate or monetary policies nor by credit-financed aggregate-demand stimuli akin to those fueling the post-independence boom. In the future, growth will have to come from within, driven by entrepreneurship, innovation and increasing productivity, which is even more important in countries that have no standard tools available to provide the demand stimuli.

The twin objectives of increasing potential growth and increasing international competitiveness place higher education, research and innovation at the center of the GoM policy agenda. The request for World Bank support in the areas of higher education and research and innovation has thus been very encouraging, demonstrating Montenegro's interest in building on the progress made thus far (the recent Global Competitiveness Index 2010-2011 ranked Montenegro's competitiveness as 49th out of 139 countries, ahead of some EU countries and 6th out of 24 Europe and Central Asia Region countries).

In its efforts, Montenegro is aided by the fact that it lies in close proximity to European and Russian markets. The key sectors of Montenegro's open economy - and potential growth engines over the longer term - include tourism and service industries. Montenegro's energy sector could also become an important source of growth and exports provided that environmental impacts can be adequately contained. The economic relevance of the heavy metal industry and associated industries and services (mining, railways, harbor, and energy) declined owing to deteriorating competitiveness. The share of Small and Medium Enterprises (SME) has constantly increased but these firms remain focused on the domestic market and need to become more competitive.

Applied knowledge is the key in this context for relevant and impactful innovation and technology transfer, and the partnership between the Ministry of Science of Montenegro (MoS), Ministry of Education and Sports of Montenegro (MoES) and the World Bank can provide the large-scale leverages needed to transform higher education, research, and innovation into mainstream economic drivers for Montenegro. This will support Montenegro as it moves closer to EU accession, by helping the GoM develop the capacity to meet the EU Acquis standards in the areas of enterprise and industrial policy

and science and research, and to align the economic directions with the priorities expressed in the Europe 2020 Strategy. Montenegro must increase its competitiveness and review its policies with regard to employment, skills development, and technological innovation and absorption. In all of these areas, education plays a crucial role.

Minimal spending on research and development (R&D), particularly by the business sector, is constraining Montenegro's innovative capacity. The R&D expenditures amount to less than 0.16 percent of GDP according to the available data, which would significantly trail the EU25 average of 1.86 percent and falls far short of the 3% target of the Lisbon Agenda/Europe 2020 Strategy. The low levels of business R&D are a result of the decline or closure of industrial firms that used to have in-house R&D units and now tend to rely on technology acquisition from abroad. At the same time, no new knowledge-intensive industries are emerging yet in significant numbers. Consequently, the share of high-technology exports in Montenegro's export basket remains low. The University of Montenegro (UCG) absorbs the majority of public R&D expenditures and generates the most publications in international refereed journals, but its pipeline of applied R&D and technology commercialization projects is still weak.

Several factors are inhibiting innovation and R&D in Montenegro: a fragmented innovation policy framework focused too much on basic, isolated R&D; poor linkages between higher education institutions, R&D centers, and private businesses at national and regional levels; the insufficient availability of scientists and engineers; much of the laboratory equipment in Montenegro is worn out or inadequate for the needs of world-class scientific and applied R&D; limited technology commercialization and patenting activities. These factors are common to other Western Balkan countries.

The GoM has already approved a two-pronged strategy for strengthening capacity for innovation and R&D which proposes to: (i) participate in a regional initiative to enable economies of scale and increased productivity of local research through enhanced cooperation and specialization at country level; (ii) invest domestically to strengthen the quality of higher education and the creation of national R&D systems to serve as a bridge between businesses and universities, including an innovative drive to develop a few Centers of Excellence (CoE) in teaching and research, focused on locally relevant and globally competitive areas. The 2008 Law on Scientific Research Activity has laid the legislative basis for launching these initiatives, and in 2011 a separate Ministry of Science was established to strengthen the institutional arrangements.

The GoM is committed to investing - both financially and structurally - in utilizing its human capital to drive economic expansion. To this end, it is seeking support for improving its capacity to produce the right kinds of quality human capital as well as the research and innovation elements that emerge from human capital improvements. Strengthening human capital and innovation infrastructure capacities is a pre-requisite for effective participation in the European Commission's (EC's) framework programs and for integration into the European Research Area. With this as its backdrop, the proposed Montenegro Higher Education, Research, and Innovation for Competitiveness (HERIC) Project has emerged as an important instrument for promoting large-scale improvements in Montenegro's higher education, research, and innovation sectors.

This Environmental Management Framework (EMF) for HERIC Project has been undertaken for the Ministry of Science, in line with the World Bank Operational Policy/Bank Procedure (OP/BP) 4.01 and relevant national legislation. The Project is classified as Category B project, requiring partial Environmental Analysis, but not a full-scale Environmental Assessment. The EMF is being carried out as a part of the Project preparation activities with an overall objective to identify potential direct and indirect environmental impacts associated with the Project and to propose adequate mitigation measures.

The EMF findings are presented in this final report. The report comprises introductory section and sections with project description, overview of legal and institutional framework for environment and other areas of relevance for project implementation, as well as description of national and WB procedures for the assessment of environmental impacts and other permitting procedures. Furthermore, the EMF presents identified possible environmental impacts from implementation of different project activities, assesses them and recommends mitigation measures.

The draft EMF has been disclosed for public consultations on October 18, 2011. The summary record of the public discussion is presented as an integral part of this report (see section 9 and Annex 7 below). Following the completion of public consultations, the Final EMF has been submitted to the Bank by the borrower to be disclosed in accordance with the Bank's policies.

2 Project description

In the context of sustainable and expansive economic development, higher education, research, and innovation are completely entwined. Across the Central and Eastern Europe (CEE) region, the last vestiges of the historic separation of R&D institutes from universities are being undone, in order to maximize the full potential of knowledge generation, dissemination, and utilization. The HERIC Project, developed to support improvements in the quality and relevance of knowledge production and dissemination in Montenegro, will be comprised of four components, as described below (see Annex 2 for additional information on the HERIC Project description).

Component 1 – Higher Education Finance Reforms and Implementation of Quality Assurance Norms (Bank financing: US\$6.75 million).

The newly adopted Strategy on Higher Education contains specific and targeted goals for reforming the financing of higher education in Montenegro, in order to:

- ensure that the mechanism for financing teaching/research in higher education follows global good practices, as well as the limited public resources are directed toward results and outputs, and in a manner relevant to the public interest;
- implement quality assurance processes and a reaccreditation procedure that are transparent, relevant, and that provide a level playing field for public and private institutions; and

- enhance the quality of data collected about higher education and research, to conform to EU expectations and international good practices.

In Montenegro and many countries and regions around the world, there is an increasing interest in quality assurance in higher education, which reflects its fast growth and related costs. According to the European Association for Quality Assurance in Higher Education (ENQA)¹, if Europe intends to be the most dynamic and knowledge-based economy in the world, then European higher education will need to demonstrate that it takes the quality of its programmes and awards seriously and is willing to put into place the means of assuring and demonstrating that quality.

In this context, this component would finance activities to implement the goals of the Strategy through such measure as improving the administrative capacity of the Council of Higher Education and the Higher Education Department, through activities such as study visits and technical assistance, to support Montenegro's systems being in full compliance with the norms and standards of the European Quality Assurance Register for Higher Education (EQAR)² and ENQA. It would also finance a sector-wide evaluation of the Universities, which includes baseline, and follow-up studies. The assessment of Bologna implementation would be part of these studies, as well as the assessment of learning environment. Some identified needs of individual faculties would be financed under implementation of the grants subcomponent.

In addition, it is important to note that Montenegro suffers from a mismatch between acquired skills and knowledge and the needs of the labor market. For example, according to the Employment Agency of Montenegro the lack of trained labor in the market represented the single most important reason that employers had given for not being able to fill positions, and 61 percent of employees who received training in the previous year were trained in basic skills and knowledge (basic computer literacy and other courses, and knowledge of English language. Little attention is paid to upgrading labor market skills. Actually, the issue of the jobs/skills mismatch is a global challenge being addressed in every region of the world.

The MoES does not currently have any mechanisms to collect, analyze, and disseminate information systematically on Montenegrin graduates employment outcomes. Such information is useful for helping policy makers and higher education institutions detect which programs and fields of study are in high demand among employers. Moreover, this

¹ The European Network for Quality Assurance in Higher Education was established in 2000, to promote European co-operation in the field of quality assurance. In November 2004, the General Assembly transformed the Network into the European Association for Quality Assurance in Higher Education. The idea for the association originates from the European Pilot Project for Evaluating Quality in Higher Education (1994-95), which demonstrated the value of sharing and developing experience in the area of quality assurance.

² In most European countries, higher education institutions or study programmes are subject to regular external review by a QA agency. The European Quality Assurance Register for Higher Education (EQAR) is a register of such agencies, listing those that substantially comply with a common set of principles for quality assurance in Europe.

information can help students make better choices about which university to attend and which field of study to pursue. This component would finance one tracer study and skills and two knowledge labor market studies (one benchmark and one results study), which includes technical assistance for designing such studies and carrying out the related proposed methodologies.

Component 2 – Human Capital Development through Internationalization Initiatives (Bank financing: US\$2 million).

The GoM recognizes that immediate impacts can be made in the short-term by investing in international experience for students and academic staff. Therefore, the GoM envisions a program where existing internationalization opportunities and activities are centralized for student accessibility and where Master's and Doctoral students would be supported in degree granting studies outside of Montenegro, to capture the very best education available in the world and bring that knowledge and training back to the country.

This component addresses cross-border opportunities in two ways: (i) establishing a facilitation agency, which would serve as a clearinghouse for all information regarding international opportunities for students and academic staff; and (ii) funding the development and implementation of a targeted scholarship scheme for graduate and post-graduate students, including improved and modernized student residence hostels, as well as mechanisms to attract international staff to Montenegrin higher education institutions, into fields deemed nationally important. The activities would also support a feasibility study to examine the potential of introducing some basic changes, such as greater use of English language in the classrooms and provision of subsidized housing, for instance, to lure foreign scholars and students. Finally, as a bridge to Component 3 below, internationalization efforts can and ought to be embedded into every ambitious academic program, as it would be in the competitively awarded (and well-funded) posts at newly established CoEs.

Component 3 – Establishing a Competitive Research and Innovation Environment (Bank financing: US\$10 million).

Establishing Centers of Excellences (CoEs) in scientific research is a core component of the GoM's science and innovation strategy, as articulated in the Law on Scientific Research Activity. The establishment of CoEs would help to upgrade Montenegro's science and technology infrastructure in areas where the scientific and economic potential are highest, thereby enhancing the quality and relevance of R&D outputs and increasing cooperation with the private sector and foreign research institutions. The proposed Project would support the development of the criteria defining the CoE and their governance framework and the actual establishment of the first CoE as a pilot for future CoEs.

The pilot CoE to be supported by the Project would be selected through a competitive process that involves recognized international experts, as established in the law. It is envisioned that existing faculties and research institutes would compete, either on their own or in consortia, to establish this CoE. The CoE would be equipped with state-of-the-

art specialized scientific equipment and pilot plant facilities, and would adopt world-class laboratory management practices and environmental standards.

The Project would co-finance the upgrading of the facilities and the scientific equipment to be purchased, provide technical assistance and training to the management and staff of the new CoE to strengthen strategic areas (particularly project management, monitoring and evaluation, intellectual property rights and technology transfer, entrepreneurship promotion), and fund the development of partnerships with private sector and international research centers. To improve sustainability, the CoE needs to have clear plans to attract external financing through the commercialization of knowledge and intellectual property, provision of technical services, and access to EU and international funds.

To strengthen R&D capacity in the national innovation system, the HERIC Project would support the establishment of a competitive grants program funding larger, more impactful R&D activities that can lead to international collaboration and generate commercial innovations. The grants would be awarded to researchers in Montenegrin research institutions or firms that apply to initiate a programmatic R&D “subproject” together with an international partner. The allocation would take place through calls for proposals administered by the MoS. A committee of international experts would evaluate the subprojects based on several criteria, including the quality of the proposals, the capacity of the domestic and international sponsors and the expected scientific and technological results. The grant for each subproject is expected to be €\$300,000 – €\$500,000 for a period of up to three years, which would cover, *inter alia*, salaries for the subproject leaders, young researchers and technicians, materials and equipment, as well as travel expenses. Firms wishing to participate would need to match the public contribution on a 30% (firms) and 70 % (contribution of Ministry of Science) basis using in-kind or financial contributions.

This grants subcomponent would fill a critical gap in the funding space for research and innovation between the existing “National Projects” research grants program (where the average grant is €30,000) and the planned CoEs. By building nuclei of internationally-recognized research, the proposed Project would nurture the development of future CoEs. The new funding stream would lead to an increase in the R&D-to-GDP ratio while raising the quality of public expenditure in Science, Technology and Innovation (STI), as the share of competitive funding will go up substantially.

Technical assistance would be provided to build capacity in the MoS to administer the new CoE and grant programs. This would include engaging international and national experts to assist the Project Management Team to: (i) develop the tender dossier for the CoE and research grant program (manual on financing programmes, call for proposals, guide for applicants, manual for selection procedure, as well as for the monitoring and evaluation process); (ii) carry out an assessment of the physical and equipment upgrading needs and skills gaps in the institution or consortia that would establish the CoE, which would help to speed up procurement; (iii) undertake a study about the labor market for researchers and engineers that would be used to strengthen the linkages between the components of the Project.

Component 4 – Project Management and Monitoring and Evaluation (Bank financing: US\$0.8 million).

This component was designed to build capacity within MoES and MoS to manage the day-to-day implementation of the HERIC Project, as well as monitor and evaluate its impact. It would support the establishment of a minimal Project Management Team (PMT) comprised of two Project Managers who would report directly to the Project Director, and of two Assistants who would report to the mentioned Project Managers. This component would finance the salaries of PMT staff, and financial audits. This component would also finance, on a pro rata basis with other ongoing World Bank-financed projects in Montenegro, consultant services of the Technical Service Unit (TSU)³ within the MoF. The professionals of TSU in charge of fiduciary issues of the Project would be considered members of the PMT. Lastly, this component would provide funds for M&E studies.

3 Overview of the policy, legal and administrative framework

3.1 Environment

Ministry of Tourism and Environment (MTE) has the key role in formulation of environmental policy in Montenegro. The Ministry performs administrative supervision over institutions that are involved in environmental monitoring (Hydro-meteorological Institute, Agency for Environmental Protection of Montenegro). It also performs administrative supervision over the Environmental Protection Agency, established in November 2008, which implements legislation on environmental protection (with functions in monitoring and reporting, environmental permitting and inspection, communication). Other ministries the authority of which is directly or indirectly related to the environmental protection are: Ministry of Agriculture and Rural Development, Ministry of Transport and Maritime Affairs, Ministry of Economy and Ministry of Health. Competences for environmental management are not always clearly delineated, which hampers efficient and effective policy responses to a certain extent.

Major steps have been taken in Montenegro during the last few years towards alignment with the EU environmental legislation, in particular with horizontal, air quality, water management, waste and chemicals management and environmental protection. Efforts have been made to integrate environmental considerations in other policies. Strategic master plans on water supply, waste and wastewater were adopted in 2004 and 2005, and the National Strategy on Sustainable Development in 2007. A National Waste Management Plan was adopted in 2008. The Government of Montenegro adopted the National Programme for Integration of Montenegro into the EU 2008 – 2012 in 2008 (chapter 3.27 is on environment). Montenegro has adopted a Strategy on the protection from ionizing gasses, radiation security and management of radioactive waste, with Action Plan, as well as First National Report on Implementation of the Obligations

³ The TSU is an entity established by and within the MoF, which provides fiduciary services (financial management, procurement, and disbursement related activities) to the projects funded by the World Bank.

arising from Joint Convention on Safety of the Spent Fuel Management and on the Safety of the Radioactive Waste Management.

Environmental legislation that will provide a framework for implementation of HERIC Project and has served as a basis for this assessment is described below (with an exception of EIA legislation, which is described in more details in section 4.1).

The ***Law on Environmental Protection*** (Official Gazette of Montenegro No 48/08) is a framework law in the field of environment. This Law has established the principles for environmental protection and sustainable development, subjects and instruments of environmental protection, public participation in the issues regarding environment etc. Environmental protection provides a complete conservation of the environmental quality, conservation of biological and landscape diversity, rational use of natural resources and energy in the best way for the environment, as basic condition for a healthy and sustainable development. State authorities, organs of state administration, local government units, domestic and foreign legal and natural persons, non-governmental organizations, citizens and associations of citizens provide environmental protection, in accordance with their rights and obligations.

Subjects of environmental protection have to, in accordance with their rights and obligations, provide control and prevent all types of pollution and environmental degradation, their reduction on the lowest possible level, but also repair and rehabilitation of the parts or segments of environment which quality is violated by the pollution and other forms of degradation, thus providing sustainable use of natural resources as basic condition for sustainable development.

The ***Law on Strategic Environmental Assessment*** (SEA) (Official Gazette of the Republic of Montenegro No 80/05) was adopted in 2005, but its implementation started in 2008. This Law determinates the conditions, method and procedure for assessment of impacts of certain plans and programs on the environment, throughout integration of principles of environmental protection into procedures for preparation, adoption and implementation of plans and programs that have significant environmental impact. The Law is highly aligned with the EU Directive 2001/42/EC.

The aims of strategic assessment are: providing that the issues regarding environment and human health will be taken completely in consideration during the implementation of the plans and programs; establishing the clear, transparent and efficient strategic assessment procedures; providing public participation; providing sustainable development and promotion of the level of human health and environmental protection.

The strategic environmental assessment (SEA) is mandatory for plans and programs in the field of agriculture, forestry, energy, industry, including mining, transport, tourism, regional development, telecommunications, waste management, water management, coastal zone management, urban or physical planning or use of land, that give frame for development of the projects, that are subject to environmental impact assessment aligned with special legal act, as well as for those plans and programs that, considering the area

within they are carried out, could affect protected areas, natural habitats and wild flora and fauna.

The *Law on Air Protection* (Official Gazette of Montenegro No 2525/10) is a framework law that regulates air quality management in line with the Directive 96/62/EC.

The Law regulates the standards of air quality, monitoring, protection measures, assessment and improvements of air quality, and other issues. In the recent period, several bylaws have been adopted to transpose into national legislation provisions of other relevant EU directives on the identification of the types of pollutants, methods of air quality monitoring, content of pollutants in liquid fuels of petroleum origin, ozone layer protection, air pollution from the stationary resources etc.

The *Law on Protection from Noise in the Environment* (Official Gazette of Montenegro No 28/11) is implemented in relation to the noise in the environment, especially in built areas, city parks and other silent areas in agglomerations, silent areas in the nature, in proximity of schools, hospitals and other objects in which the population is exposed to the harmful effects of noise, especially the vulnerable groups (children, elderly, patients). Allowed levels of noise are determined by the Decree on the Limit Values of Noise in the Environment (Official Gazette of Montenegro No 75/06).

The *Waste Management Law* (Official Gazette of the RM, No. 80/05) regulates types and classification of wastes; planning of waste management; conditions for waste collection transport, treatment, storage and disposal; rights, duties and responsibilities of legal and physical persons involved in waste management; and conditions and procedures for waste management permits. It also defines principles for managing specific waste streams, regulates incineration etc. The Law comes into force in 2008 and has been harmonized with the EU Waste Framework Directive. National Waste Management Plan was adopted in the beginning of 2008 and preparation of bylaws (rulebooks) on landfills and on classification of wastes/ methods for waste examination is ongoing.

The Law does not apply to wastes from slaughter houses and animal carcasses, nor to animal by-products/ other natural and non-hazardous materials that can be used in agriculture. Article 51 of the Law calls for detailed regulations prescribing the types of veterinary wastes the processing of which is not allowed as well as the ways to manage and dispose of veterinary wastes. MAFWM/ Veterinary Directorate are working on development of an EU compatible legal framework to regulate safe removal, collection, storage, transport and disposal of animal by-products (including those containing Specified Risk Materials – SRMs).

The Law on Nature Protection (Official Gazette of Montenegro No 51/08 and 21/09) in its general terms prescribes the general measures of protection conservation of nature; protection of natural goods; sustainable use of natural resources and natural goods and the control of their usage; conservation of ecological networks and corridors; implementation of strategies, plans, programmes, bases and other documents; mitigating

harmful consequences caused by activities in the nature, by exploitation of natural resources or natural hazards; stimulating measures for the protection and conservation of natural resources. The law specifically determines the conservation of forest ecosystems, moist and water habitats, protection of the sea and underwater, protection of habitats within agroecosystems and other non-autonomous and semi-autonomous ecosystems, conservation of genetic diversity.

In accordance with the Law on Nature Protection, the protected natural areas / objects are categorized in: I – protected natural goods of extraordinary importance; II – protected natural good of high importance; and III – significant protected natural good. The characteristics of natural good are defined, which classify it one of the categories. Categories of protected natural goods are: strict nature reserve, special reserve, national park, regional park, monuments of nature, natural park, protected habitat, a landscape of extraordinary characteristics.

The Law on Nature Protection transposes the directives on natural habitats (92/43/EEC) and birds (79/409/EEC) and Regulation (EC 338/97) on the protection of wild species of fauna and flora by regulating trade. The law introduces balanced categorization of the protected areas of the European Union, prescribes procedures for categorization of protected areas (including the requirement for the designation of managers for each category) and sets the basis for the establishment of Natura 2000 network. The protection of nature is regulated also by the Law on National Parks (Official Gazette of Montenegro No 56/09). The law allows for the protection and promotion of national parks by: providing conditions for protection, improvement and rational use of goods from the national parks; providing favorable conditions for conservation and growth of plants, animals and fungi and their communities; conservation and improvement of special natural values; research and use of national parks for the sake of development of science, education, tourism, culture and recreation; prevention of activities that can disrupt basic traits and characteristics of national parks and conservation of the environment. National parks are managed by the Public enterprise for the management of national parks of Montenegro, the founder of which is the Parliament of Montenegro.

Another important piece of environmental legislation that came into force in 2008 is the *Law on Integrated Prevention and Pollution Control* (IPPC) (Official Gazette of the RM No 80/05). The IPPC Law regulates environmental pollution prevention and control through integrated permits for installations and activities that may have a negative impact on human health, the environment or material resources. It lays down measures designed to prevent or to reduce emissions to air, water and soil, including measures concerning waste, efficient energy consumption, reduction of noise and vibrations, use of raw materials, prevention of accidents, and risk assessment. The integrated permitting system is based on the concept of best available technique (BAT).

Several bylaws were passed under the IPPC Law including: the Decree on types of activities and installations subject to integrated permits (Official Gazette of Montenegro No 7/08); the Decree on criteria for determining best available techniques, for application of quality standards and for determining limit emission values in the integrated permit (Official Gazette of Montenegro No 7/08); and the Decree on content of the program of measures for adjusting the existing activities or installations to prescribed conditions

(Official Gazette of Montenegro No 7/08). Existing installations are required to comply with the IPPC requirements by 2015. An inventory of IPPC installations has not been completed yet.

The *Law on Chemicals* (Official Gazette of Montenegro No 11/07) has also been passed in an effort to start transposing the *acquis* in this area. It regulates procedures for notification and placing on the market of new and existing chemicals, evaluation and chemicals risk assessment procedures, classification, packaging and labeling of chemicals, imports and exports, and other issues important for protection of human health and the environment. The law is partly harmonized with EU directives and it is in the process of changes and amendments, expected to be adopted by the end of 2011.

Law on water (Official Gazette of Republic of Montenegro No 27/07 and No 32/11) regulates the legal status and integrated water, water and coastal land and water facilities management, conditions and methods of water activity and other significant issues of water management and water resources.

3.2 Physical planning, construction and natural resources management

Competences for physical planning and construction are shared between national (currently Ministry of Sustainable Development and Tourism) and local level (local self-government units).

The Law on Physical Planning and Construction of Facilities (Official Gazette of Montenegro No 51/08 and 34/11) prescribes types of planning documents, contents and procedures for their preparation and adoption, enforcement of plans, and other issues. Depending on the type of plan, responsibilities for preparation and enforcement lie with either national or local level administration. At the national level, the following plans are developed: national spatial plan; spatial plans for special purpose areas (prepared for public maritime domain and national parks); detailed spatial plans (prepared e.g. for infrastructure systems); and national studies of locations (detailed plans for areas within spatial plans for special purpose areas). Development of national and of special purpose areas spatial plans is mandatory. Local level administration is responsible for the following plans: municipal spatial and urban plan (covering the whole area of respective local government unit), detailed urban plan, urban projects and local studies of locations. Development of municipal spatial urban plans is mandatory.

Enforcement of plans is linked to administrative procedures for issuing urban and technical conditions for construction of facilities and issuing location permits for construction or reconstruction of facilities and execution of works, as well as the operational permits. In accordance with the changes and amendments of the Law on physical planning and construction of facilities (OG MNE 34/11), the administrative body issues conditions and location permit for state facilities of general interest and facilities covered by article 91 of this law. For all other facilities, no matter the planning

document (national or local), the conditions and location permit are issued by the local administrative body.

4 EIA and other permitting procedures under Montenegrin legislation

4.1 The Law on EIA and relevant bylaws

The *Law on Environmental Impact Assessment (EIA)* (Official Gazette of the RM No 80/05) prescribes procedures for carrying out an EIA for projects that may have significant impact on the environment, contents of the EIA study, participation of interested organizations and of the public, procedures for evaluating EIA studies and issuing approvals, notification of other states on projects with potential transboundary effects, supervision and other relevant issues. Before the Law came into effect on 1 January 2008, several bylaws were passed to regulate issues not detailed by the Law and to enable its implementation. These are:

- Decree on projects subject to EIA (Official Gazette of Montenegro No 20/07);
- Rulebook on content of documentation to be submitted together with request for determination on the need for EIA (Official Gazette of Montenegro No 14/07);
- Rulebook on content of documentation to be submitted together with request for determining the EIA scope and contents of the EIA study (Official Gazette of Montenegro No 14/07);
- Rulebook on content, form and a way of keeping the public record on actions and decisions on EIA (Official Gazette of Montenegro No 14/07); and
- Rulebook on contents of the EIA study (Official Gazette of Montenegro No 14/07).

The EIA law and related secondary legislation are to a high degree harmonized with the EU Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment, as amended by 97/11/EEC and 2003/35/EC.

Subject of the EIA are projects that are planned or executed and that can significantly impact the environment and health of population.

The impact assessment is carried out for the projects from the field of industry, mining, energy, transport, tourism, agriculture, forestry, water management and communal affairs, and all other projects planned in the protected natural areas and in protected areas surrounding an immovable cultural monument.

The Decree on projects for which the EIA is conducted (OG of Montenegro 20/07), determines the projects for which EIA is obligatory and those projects that may be

required the EIA. The study analyses and grades the quality of segments of the environment and their sensitivity on a particular area, mutual impact of existing and planned activities, forecast of direct and indirect impact of the project realization on the environment, as well as the measures and conditions for prevention, removal, mitigation or recovery of hazardous impacts to the environment and the health of people. The study is an integral part of the documentation necessary for acquisition of permits, approvals or consents for the start of the project execution or its operating license.

Competent authority for conducting the EIA procedures⁴ is state administration body responsible for environmental protection (Environmental Protection Agency) for projects for which other consents, approvals and permits are issued by other state administration bodies (i.e. national level administration). For other projects for which consents, approvals and permits are issued by other bodies of the local administration, competent authority is part of a local self-government unit responsible for environmental protection.

Public disclosure of information on the EIA procedure is required in all the stages – namely in the screening stage (decision on the need for EIA), scoping (decision on the scope and content of the EIA) and decision making stage (approval or rejection of a project). The EIA study is subject to a mandatory public hearing, organized by the competent authority. The scoping and final decision on the EIA is made by a commission appointed in accordance with the EIA Law, comprising staff of the competent authority and other experts (a member of the commission cannot be appointed if he/ she has been involved in preparation of the EIA study or linked to those who have been preparing it).

Costs for preparation of the EIA study are borne by project proponent. Project proponent is also responsible for implementation of all the mitigation measures identified in the EIA study for which the consent has been issued. Monitoring of the implementation is responsibility of the competent authority. Operation permit for a given project can only be issued once the competent authority verifies that the all the measures envisaged in the EIA study have been implemented.

4.2 Other permits

Construction or reconstruction (in case the latter entails changes in the size of the respective object) of facilities requires acquisition of three permits – location, construction and operation permits.

Procedures for procurement of **location permits** are defined by the *The Law on Physical Planning and Construction of Facilities* (Official Gazette of Montenegro No 51/08 and 34/11). The location permit is an administrative document allowing the holder to obtain other permits and consents necessary for development/ execution of works at the given location. The permit is issued based on the relevant spatial/ urban plan and it specifies

⁴ Deciding on the need for EIA, deciding on the scope and content of the EIA study, evaluating quality of the EIA study and issuing final approval/ rejecting the project.

type and purpose of object or works to be executed. Integral parts of the permit are urban and technical conditions that include information such as: geodetic-cadastral bases; number of floors; maximum allowed capacities of an object; site plan; approximate base of a structure (horizontal and vertical outlines); type of façade and roof material, meteorological data; seismic parameters; environmental protection requirements; elements of cultural heritage, connections to infrastructure, etc.

Construction permits are issued based on the provision of *The Law on Physical Planning and Construction of Facilities* (Official Gazette of Montenegro No 51/08 and 34/11) by the responsible state administration body (currently Ministry of Economic Development) for facilities in the areas covered by state planning documents (e.g. for facilities to be located in the area of public maritime domain) and those that are of determined to be of national importance (such as large industrial installations, fuel storage tanks, all types of infrastructure, landfills and installations for treatment of solid and hazardous wastes, etc.). Commercial and residential buildings with a surface of more than 1,000 m² or more than 4 floors are classified as facilities of national importance. For other facilities, construction permits are issued by local authorities.

Documentation for procurement of construction permit includes: location permit; main project with accompanying urban consent; technical verification that the main project meets requirements of relevant regulations; proof of ownership or proofs of other types of rights over the construction land; proof that relevant fees and charges have been paid; and consents, approvals and other documentation, as determined by specific regulations (the last category includes water use consent, environmental consent i.e. an approved EIA for project subject to environmental assessment, and other consents).

Operation permits are also regulated under *The Law on Physical Planning and Construction of Facilities* (Official Gazette of Montenegro No 51/08 and 34/11). These permits are issued after a technical assessment of the constructed object is performed, if shown that the object has been constructed in compliance with construction permit, main project and other conditions stipulated in relevant documentation. Technical clearance of the facility and issuance of operation permit is also subject to verification that mitigation measures envisaged in the EIA study have been implemented and that water permit has been obtained. Competences for issuance of operation permits are shared in the same way as for construction ones.

According to Article 114, Paragraph 1 (Official Gazette of Republic of Montenegro No 27/07 and No 32/11), the investor has to provide **water conditions** for development of technical documentation for construction of new or reconstruction of existing facilities and for implementation of geological research and other works that may permanently, intermittently and temporarily affect the changes of water regime.

According to Article 118, Paragraph 1 (Official Gazette of Republic of Montenegro No 27/07 and No 32/11), the investor has to provide a **water consent** before the start of the construction of new or reconstruction of existing facilities and installations and other works that require water conditions.

According to Article 120, Paragraph 1 (Official Gazette of Republic of Montenegro No 27/07 and No 32/11), before use of facilities and plants that require water consent, the investor has to provide a **water permission**, establishing that the facilities and plants are constructed in accordance with water consent.

5 WB Environmental Assessment procedures and other safeguard policies

The World Bank requires that an environmental assessment (EA) of projects proposed for Bank financing is carried out to ensure they are environmentally sound and sustainable, and that the interested public has been informed and consulted. Under the Bank's regulations, the borrower is responsible for carrying out the EA in compliance with both the country's legislation and the Bank's operational policies. The Bank's EA policy and procedures are described in OP/BP 4.01.

An EA is a process whose breadth, depth, and type of analysis depends on the nature, scale, and potential environmental impact of the proposed project. An EA evaluates a project's potential environmental risks and impacts in its area of influence. Furthermore, it examines project alternatives and identifies ways of improving project selection, siting, planning, design, and implementation by preventing, minimizing, mitigating, or compensating for adverse environmental impacts and enhancing positive impacts. Finally, an EA recommends the process of mitigating and managing adverse environmental impacts throughout project implementation. The World Bank favors preventive measures over mitigation or compensatory measures, whenever feasible.

EAs take into account the following: a) natural environment (air, water, and land); b) human health and safety; c) social aspects (involuntary resettlement, indigenous peoples, and cultural property); and d) transboundary and global environmental aspects. EAs consider natural and social aspects in an integrated way. They also take into account the following: variations in project and country conditions; findings of country environmental studies; national environmental action plans; the country's overall policy framework, national legislation, and institutional capabilities related to the environment and social aspects; and obligations of the country, pertaining to project activities, under relevant international environmental treaties and agreements. The World Bank does not finance project activities that would contravene such country obligations, as identified during the EA. EA is initiated as early as possible in project processing and is integrated closely with the economic, financial, institutional, social, and technical analyses of a proposed project.

EA Instruments

Depending on the project, a range of instruments can be used to meet the World Bank's EA requirements: environmental impact assessment (EIA), regional or sectoral EA, environmental audit, hazard or risk assessment, environmental management plan (EMP), or environmental management framework (EMF). EA applies one or more of these

instruments, or elements of them, as appropriate. When the project is likely to have sectoral or regional impacts, sectoral or regional EA is required.

Environmental Screening

The World Bank undertakes environmental screening of each proposed project to determine the appropriate extent and type of EA. The World Bank classifies the proposed project into one of four categories (A, B, C and FI), depending on the type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts. HERIC Project has been classified by the World Bank as a Category B project

A proposed project is classified as Category B if its potential adverse environmental impacts on human populations or environmentally important areas – including wetlands, forests, grasslands, and other natural habitats – are less adverse than those of Category A projects. These impacts are site-specific; few if any of them are irreversible; and in most cases mitigation measures can be designed more readily than for Category A projects. The scope of an EA for a Category B project may vary from project to project. The EA examines the project's potential negative and positive environmental impacts and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance. The findings and results of Category B EA are described in the project documentation (Project Appraisal Document and Project Information Document).

Public Consultation

For Category B projects proposed for financing, during the EA process, the borrower consults project affected groups and local non-governmental organizations (NGOs) about the project's environmental aspects and takes their views into account. The borrower initiates such consultations as early as possible.

Disclosure

For meaningful consultations between the borrower and project-affected groups and local NGOs on all Category B projects proposed for IBRD or IDA financing, the borrower provides relevant material in a timely manner prior to consultation and in a form and language that are understandable and accessible to the groups being consulted.

Public availability in the borrowing country and official receipt by the World Bank of Category B EA report for projects proposed for funding, are prerequisites to World Bank appraisal of these projects. Once the borrower officially transmits the separate Category B EA report to the World Bank, the World Bank makes it available through its Info-Shop.

Implementation

During project implementation, the borrower reports on: a) compliance with measures agreed with the World Bank on the basis of the findings and results of the EA, including

implementation of any Environmental Management Framework (EMF), as set out in the project documents; b) the status of mitigation measures; and c) the findings of monitoring programs. The World Bank bases supervision of the project's environmental aspects on the findings and recommendations of the EA, including measures set out in the legal agreements, any EMF, and other project documents.

Other WB environmental safeguard policies

The environmental assessment policy OP/BP 4.01 is considered to be an umbrella policy for the Bank's environmental 'safeguard policies' which among others include: Natural Habitats (OP 4.04), Forests (OP 4.36), Pest Management (OP 4.09), Physical Cultural Resources (OP 4.11), and Safety of Dams (OP 4.37).

6 Main impacts of the project

Only Component 2 -- Human Capital Development through Internationalization Initiatives and **Component 3 – Establishing a Competitive Research and Innovation Environment** are expected to pose any potential environmental risks. As noted in the project description section above, these components will support:

1. (Component 2) Up to 10 student hostels may be upgraded and modernized, to include renovations to toilets, doors, windows and other internal infrastructure. This would involve minor civil works impact management.
2. (Component 3) Pilot Center of Excellence (CoE) in scientific research to upgrade Montenegro's science and technology infrastructure in areas where the scientific and economic potential are highest. The pilot CoE to be supported by the Project would be selected through a competitive process, would be equipped with state-of-the-art specialized scientific equipment and pilot plant facilities, and would adopt world-class laboratory management practices and environmental standards. The CoE could involve laboratory biosafety, waste management and minor civil works issues.
3. (Component 3) Competitive grants program for medium to large scale R&D activities that can lead to international collaboration and generate commercial innovations. The grants would be awarded to researchers in Montenegrin research institutions or firms that apply to initiate a programmatic R&D "subproject" together with an international partner. The grantees would be selected through calls for proposals administered by the MoS. A committee of international experts would evaluate the subprojects based on several criteria, including the quality of the proposals, the capacity of the domestic and international sponsors and the expected scientific and technological results. The grant for each subproject is expected to be €\$300,000 – €\$500,000 for a period of up to three years. As with the CoE, the sub-projects could involve laboratory biosafety, waste management and minor civil works issues

The project is not expected to have any major environmental impact and is not expected to trigger World Bank Safeguard Policies related to Natural Habitats, Pest Management, Involuntary Resettlement, Indigenous People, Forests, Safety of Dams, Cultural Property, Projects in Disputed Areas or Projects on International Waterways (including aquifers). However, these issues are included in the sub-project environmental screening checklist, so that any potential impacts can be identified and appropriate mitigation measures adopted. Since it is possible that funded research may involve agricultural productivity improvements (including pest management), the EMF provides guidance on the FAO Code of Conduct for Pesticides (Annex 8).

The HERIC Project is classified as Environmental Category B according to OP/BP 4.01. Category B projects have some potential environmental impacts that require attention, but generally do not pose significant risks for the environment. Potential environmental impacts of Category B projects are likely to be site specific and reversible through the application of appropriate mitigation and monitoring measures.

The key environmental safeguard policy issues associated with the project are: (i) medical facility and laboratory safety and the safe disposal of wastes; and (ii) potential environmental issues arising in connection with the renovation of existing laboratory space and student hostels.

In addressing these environmental safeguard issues, all screening, monitoring and remedial measures will have to comply with GoM rules and regulations. In addition, where GoM legislation should provide insufficient safeguards, the grantees and CoE will comply with World Bank safeguard policies and procedures and with best international practice for laboratory safety, waste disposal and operating procedures. Existing Montenegrin laboratories may not currently comply with best international environmental and safety practices. Therefore, in addition to helping to develop Montenegro's research and scientific capacity, this project will help to introduce world class safety and environmental procedures and ensure that those facilities supported by the project serve as a model for other facilities.

7 Screening, EMP Preparation, Exclusions, Consultation and Monitoring

Environmental Screening Procedure for CoE and Grants Program

The procedure is made up of five steps listed below:

- Screening and Exclusions
- Disclosure and Public Consultation
- Review and Approval
- Conditionality
- Monitoring and Reporting

Details of procedures required for each of these steps are subsequently described and shown in the Annexes.

Screening

Environmental Screening Questionnaire will be required for the CoE and every grant sub-project application.

The applicant will be responsible for ensuring that all of the adequate documentation has been submitted and filed, including: (a) all of the GoM EA documentation; (b) official approvals for the documentation from responsible authorities for protection of environment, and (c) copies of the environmental permit. The applicants will be responsible to meet all of the legally prescribed requirements and to submit proof of doing so – through the documentation listed above. The incomplete applications will not be considered for financing.

Under the World Bank system, activities will be categorized in accordance with the following three screening categories.

- Category I (Low Risk): grant activities whose environmental impacts are expected to be negligible, for which no environmental evaluation will be required, corresponding to a World Bank Category C. Category I activities have no further environmental assessment requirements.
- Category II (Intermediate Risk): grant activities with impacts that can be readily identified and standard preventative and/or remedial measures can be prescribed without a full EIA as per the Law on Environmental Impact Assessment. Mitigating measures are standard, readily identified, and would be carried out by the beneficiary as a condition of the sub-project. This category corresponds to World Bank Category B and requires a sub-project EMP.
- Category III (Not Eligible for Financing): activities which may have potential and highly significant or irreversible environmental impacts, the magnitude which are difficult to determine at the project identification stage (these will probably be identified in the first step) – corresponding to World Bank Category A. In addition, activities which involve resettlement or land acquisition, any type of new construction or rehabilitation activities except for simple renovation or small construction works, as well as those that include activities on the IFC exclusion list are not eligible for financing.

For grant applications corresponding to Category II (or WB Category B) an Environmental Management Plan (EMP) will be required. The format for a comprehensive EMP is presented in Annex 2. The applicant is responsible for preparing the EMP. If the Grant Applicant/Beneficiary refuses to prepare the EMP, the activity/application would be ineligible to access funds from the Project.

If a Request for an Environmental Permit was prepared by the applicant to meet GoM Environmental Assessment requirements, this documentation should be used to prepare

the EMP. The HERIC Environmental Expert, to be engaged through the project, should check the Request and the EMP to insure, as a minimum, consistency in terms of: (a) identifying the same priority environmental issues, mitigating measures and implementing responsibility, (b) monitoring program, (c) institutional arrangements for environmental management.

Exclusions

The HERIC Project has the overall B category as per the World Bank Environmental Assessment safeguard policy. The project will not finance:

- Any activities which would have an irreversible and substantial environmental impact, or correspond to a World Bank Category A project. This means that the Project will not finance activities for which a Full Environmental Impact Assessment is required as per the Law on Environmental Impact Assessment.
- Any activities which involve land acquisition or any form of resettlement
- Any of the activities listed in the World Bank Group -IFC Exclusion List given in Annex 5
- Any new construction or major rehabilitation activities (small civil works for renovations are eligible)

The comprehensive exclusion list is given in Annex 5.

The HERIC Environmental Expert, to be engaged through the Project, will be responsible for screening subprojects/grants selected for financing to: (1) ensure compliance with the World Bank Group (IFC) exclusion list, (2) ensure that no subprojects with significant impacts of a Category A type are supported, (3) that subprojects/grants will not necessitate involuntary land acquisition, and (4). that subprojects/grants will not finance any activities which involve land acquisition or any form of resettlement.

Disclosure and Public Consultation

The candidate CoE and Grant Applicants/Recipients are responsible for disclosing the EMP (both the draft EMP used for consultations and the final EMP revised following comments received during consultations) in a public place (library, municipal or government building etc.) near the project site and on the enterprise website, and place a notification in the local media (e.g. newspaper) as to where the EMP may be viewed, with a suitable feedback mechanism in place for comments or queries (both on-line and hard copy). Data on where and how the EMP was disclosed should be a part of the Final EMP.

Within the HERIC Project the grant funds will be provided for innovation purposes. Innovation and technological development are very sensitive issues with regards to disclosure of details related to the processes and activities involved. As such, the Grant Applicant/Recipient reserves the right to abbreviate the EMP in a manner where information disclosed will not disclose any of the confidential information related to the

innovation process itself but will sufficiently explain how the financed activities will mitigate any of the associated environmental impacts.

Review and Approval

The HERIC Environmental Expert, to be engaged through the Project, is responsible for the preliminary screening of the proposed grant, or for checking the screening questionnaire already filled in by the applicant and for review of the sub-project EMP forms. The MoS does not bear any liability for information that may be untruthfully and intentionally provided by the applicant.

Conditionality

The MoS will include Grant Applicant/Recipient commitment to implement the requirements set forth in the EMP into the grant agreement. The Grant Applicant/Recipient will be required to show best effort to ensure that the funded activity is carried out with attention to good environmental management. The Applicant/Recipient will be held responsible for all mitigation measures that have been listed in the EMP.

Monitoring and Reporting

As part of normal monitoring activities the MoS and the HERIC Environmental Expert will perform desk and field-based monitoring functions to assure compliance by the grant recipients with overall and environmental obligations specified in the grant agreement. The performance reports will contain details on supervision of potential environmental impacts and report on implementation of EMPs for grants that were required to prepare an EMP. Through this report, the MoS and HERIC Environmental Expert will verify whether or not environmental requirements as detailed in the grant agreement have been met. If requirements have not been met, the MoS will provide recommendations for further action to insure compliance. Depending on the severity of a compliance failure, the MoS may terminate the project financing.

8 Institutional and Implementation Arrangements

A Project Steering Committee (PSC) would be established to ensure inter-institutional coordination and provide overall Project oversight and strategic guidance, as well as to assist in resolving obstacles to Project implementation. This PSC would be chaired by the Minister of Education and Sports and the Minister of Science, and would include representatives of the MoF, Ministry of Economy, UCG, other relevant institutions and beneficiaries (R&D centers, civil society, local institutions and private sector).

The MoES and the MoS would be the main HERIC Project implementing agencies. The Project implementation would basically rely on the existing structures of these Ministries and the activities proposed under the Project would be part of the everyday work of their staffs, hence it would not require the establishment of parallel structure or a specific

Project Implementation Unit. MoS is responsible for implementation of Component 3, Establishing a Competitive Research and Innovation Environment, and for the project's compliance with the EMF. MoS will recruit an experienced environmental specialist as an advisor/consultant to provide substantive guidance on implementation of the project in conformity with the EMF. The MoS environmental specialist will also support MoES with respect to the implementation of the EMF for Component 2 (civil works for student hostel renovations). MoS will prepare the grant agreements with the pilot CoE and the research grant recipients, and will sign the grants on behalf of the Government. The Technical Service Unit (TSU) within the Ministry of Finance is responsible for fiduciary issues under the Project, including disbursements and accounting for the research grant program.

9 Summary record of public discussion

The final version of the EMF will contain an Annex on the public consultations, to include:

- Manner in which notification of the consultation was announced: media(s) used, date(s), description or copy of the announcement
 - Date(s) consultation(s) was (were) held
 - Location(s) consultation(s) was (were) held
 - Who was specifically invited (Name, Organization or Occupation, Telephone/Fax/e-mail number/address (home and/or office))
 - List of Attendees (Name, organization or occupation, contact details)
 - Meeting Agenda
 - Summary Meeting Minutes (Comments, Questions and Response by Presenters)
- List of decisions reached, and any actions agreed upon with schedules and deadlines and responsibilities.

Annex 1

SCREENING CHECKLIST TO BE COMPLETED BY ALL COE CANDIDATES AND GRANT APPLICANTS

Name of Project (Reference number):		
City/Municipality:		
Name of applicant:		
Contact:		
ENVIRONMENTAL AND SOCIAL CHECKLIST QUESTIONNAIRE (must be filled out and filed for every application)		
CRITERIA	YES	NO

Does the proposed activity require a FULL Environmental Impact Assessment as per the Montenegrin Law on Environmental Impact Assessment (list of projects for which full EIA is mandatory)? If yes, this activity cannot be financed.		
Does the existing enterprise have valid operating permit, licenses, approvals etc.? If not, please explain. Permits to screen for include: construction permit, operational/use permit, urbanistic permit, water management permit... <i>If not, will the grant financing be used to correct this condition?</i>		
Does the existing enterprise have a valid environmental permit (or is in the procedure of obtaining an environmental permit as per the Montenegrin laws) and does the proposed activity fall under those for which this permit was issued?		
Does the existing enterprise have a valid water management permit that calls for special investments or measures for the enterprise's wastewater releases (or is in the procedure of obtaining this permit as per the Montenegrin laws)?		
Does the existing enterprise need to follow specific Montenegrin environmental regulations regarding air emissions, water use or wastewater discharge and solid waste management?		
Are there any significant outstanding environmental fees, fines or penalties or any other environmental liabilities (e.g. pending legal proceedings involving environmental issues etc.) <i>If so, will the grant financing be used to correct this condition and please explain?</i>		
Have there been any complaints raised by local affected people or groups or NGOs regarding conditions at the facility? <i>If so, will the grant financing be used to remedy these complaints?</i>		
Proposed Activity		
Will the activity generate water effluents (wastewater) that may require special treatment, control or the water management permit?		
Will the activity air emissions which would require special controls in order to ensure compliance with the Montenegrin standards?		
Will the activity generate noise levels that would require control measures to ensure compliance with the Montenegrin standards? Will the noise levels impact particularly sensitive receptors (natural habitats, hospitals, schools, local population centers)		
Will the activity consume, use or store, produce hazardous materials (including pesticides) that: <ul style="list-style-type: none"> • require special permits or licenses • require licensed or trained personnel • are outlawed or banned in EU or Western countries • are difficult, expensive, or hard to manage • are inconsistent with PPAH recommendations • may cause soil and water pollution or health hazards if adequate control measures are not in place 		
Will the activity generate solid waste that may be considered hazardous, difficult to manage, or may be beyond the scope of regular household waste? <i>(This may include, but not be limited too, animal carcasses, toxic materials, pesticides, medical waste, cleaning materials, flammables etc.)</i>		
Will the activity be located within or close to natural areas, officially protected areas or areas under consideration by the Government for official protection status? And will the		

activity potentially impact areas of known significance to local, regional or national cultural heritage?		
Will the activity involve import of living organisms, e.g. saplings, insects, animals, etc. or works that can impact sensitive environmental receptors?		
Has the local population or any NGOs expressed concern about the proposed activity's environmental aspects or expressed opposition?		
Is there any other aspect of the activity that would – through normal operations or under special conditions – cause a risk or have an impact on the environment, the population or could be considered as a nuisance?		

The applicant, in signing this form states that the grant activity will not involve land acquisition, any form of construction, or will promote any activities on the IFC exclusion list. In addition, the applicant is aware of the EIA requirements as per Montenegrin Law and certifies that there are no Full Environmental Impact Assessment reports required.

Form filled out by (Applicant):	
Date:	
Name:	
Title:	
Sign:	
Stamp:	

Form checked by (Independent Environmental Expert):	
Date:	
Name:	
Title:	
Sign:	

**ENVIRONMENTAL MANAGEMENT PLAN FORMAT
(TO BE COMPLETED BY ALL CATEGORY “B” SUB-PROJECTS)**

1 I. MITIGATION PLAN

Phase	Issue	Mitigating Measure	Cost of Mitigation (If Substantial)	Responsibility*	Supervision observation and comments (to be filled out during supervision)
Construction	• • • • •				
Operation	• • • •				

* Items indicated to be the responsibility of the contractor shall be specified in the bid documents

II. MONITORING PLAN

Phase	What <i>parameter is to be monitored?</i>	Where <i>is the parameter to be monitored?</i>	How <i>is the parameter to be monitored/ type of monitoring equipment?</i>	When <i>is the parameter to be monitored- frequency of measurement or continuous?</i>	Monitoring Cost <i>What is the cost of equipment or contractor charges to perform monitoring?</i>	Responsibility	Supervision observation and comments <i>(to be filled out during supervision with reference to adequate measuring reports)</i>
Construct							
Operate							

Sample Checklist and EMP for Construction/ Reconstruction (Civil Engineering) Works

PART 1: INSTITUTIONAL & ADMINISTRATIVE				
Country				
Project title				
Scope of project and activity				
Institutional arrangements (Name and contacts)	WB (Project Team Leader)	Project Management	Local Counterpart and/or Recipient	
Implementation arrangements (Name and contacts)	Safeguard Supervision	Local Counterpart Supervision	Local Inspectorate Supervision	Contactor
SITE DESCRIPTION				
Name of site				
Describe site location	Attachment 1: Site Map []Y [] N			
Who owns the land?				
Geographic description				
LEGISLATION				
Identify national & local legislation & permits that apply to project activity				
PUBLIC CONSULTATION				
Identify when / where the public consultation process took place				
INSTITUTIONAL CAPACITY BUILDING				
Will there be any capacity building?	[] N or []Y if Yes, Attachment 2 includes the capacity building program			

PART 2: ENVIRONMENTAL /SOCIAL SCREENING			
Will the site activity include/involve any of the following:	Activity	Status	Additional refer
	A. Building rehabilitation	<input type="checkbox"/> Yes <input type="checkbox"/> No	See Section B be
	B. New construction	<input type="checkbox"/> Yes <input type="checkbox"/> No	See Section B be
	C. Individual wastewater treatment system	<input type="checkbox"/> Yes <input type="checkbox"/> No	See Section C be
	D. Historic building(s) and districts	<input type="checkbox"/> Yes <input type="checkbox"/> No	See Section D be
	E. Acquisition of land ⁵	<input type="checkbox"/> Yes <input type="checkbox"/> No	See Section E be
	F. Hazardous or toxic materials ⁶	<input type="checkbox"/> Yes <input type="checkbox"/> No	See Section F be
	G. Impacts on forests and/or protected areas	<input type="checkbox"/> Yes <input type="checkbox"/> No	See Section G be
	H. Handling / management of medical waste	<input type="checkbox"/> Yes <input type="checkbox"/> No	See Section H be
	I. Traffic and Pedestrian Safety	<input type="checkbox"/> Yes <input type="checkbox"/> No	See Section I be
ACTIVITY	PARAMETER	MITIGATION MEASURES CHECKLIST	
A. General Conditions	Notification and Worker Safety	(a) The local construction and environment inspectorates and communities have been notified	
		(b) The public has been notified of the works through appropriate notification in the most accessible sites (including the site of the works)	
		(c) All legally required permits have been acquired for construction and/or rehabilitation	
		(d) All work will be carried out in a safe and disciplined manner designed to minimize impacts on residents and environment.	
		(e) Workers' PPE will comply with international good practice (always hardhats, as well as safety glasses, harnesses and safety boots)	
B. General Rehabilitation and /or Construction Activities	Air Quality	(a) During interior demolition use debris-chutes above the first floor	
		(b) Keep demolition debris in controlled area and spray with water mist to reduce dust	
	Noise	(c) Suppress dust during pneumatic drilling/wall destruction by ongoing water spraying in enclosures at site	
		(d) Keep surrounding environment (side walks, roads) free of debris to minimize dust	
		(e) There will be no open burning of construction / waste material at the site	
Water Quality	(f) There will be no excessive idling of construction vehicles at sites		
	(a) Construction noise will be limited to restricted times agreed to in the permit		
Waste management	(b) During operations the engine covers of generators, air compressors and other power equipment should be closed, and equipment placed as far away from residential areas as possible		
	(a) The site will establish appropriate erosion and sediment control measures such as silt fences to prevent sediment from moving off site and causing excessive turbidity in receiving waters		
	(a) Waste collection and disposal pathways and sites will be identified for all major volumes of demolition and construction activities.		
	(b) Mineral construction and demolition wastes will be separated from general refuse and other wastes by on-site sorting and stored in appropriate containers.		
	(c) Construction waste will be collected and disposed properly by licensed collectors		
(d) The records of waste disposal will be maintained as proof for proper management			
(e) Whenever feasible the contractor will reuse and recycle appropriate and viable materials			
ACTIVITY	PARAMETER	MITIGATION MEASURES CHECKLIST	
C. Individual wastewater treatment system	Water Quality	(a) The approach to handling sanitary wastes and wastewater from building sites (including on-site treatment) must be approved by the local authorities	
		(b) Before being discharged into receiving waters, effluents from individual wastewater treatment systems must be treated in order to meet the minimal quality criteria set out by national guidelines on effluent treatment	
		(c) Monitoring of new wastewater systems (before/after) will be carried out	
D. Historic building(s)	Cultural Heritage	(a) If the building is a designated historic structure, very close to such a structure, or in a historic district, notify and obtain approval/permits from local authorities and address all concerns with local and national legislation	
		(b) Ensure that provisions are put in place so that artifacts or other possible "chance finds" during excavation or construction are noted, officials contacted, and works activities delayed if such finds are discovered.	

⁵ Land acquisitions includes displacement of people, change of livelihood encroachment on private property this is to land that is purchased/transferred and affects people who are living and/or squatters and/or operate a business (kiosks) on land that is being acquired.

⁶ Toxic / hazardous material includes and is not limited to asbestos, toxic paints, removal of lead paint, etc.

E. Acquisition of land	Land Acquisition Plan/Framework	(a) If expropriation of land was not expected and is required, or if loss of access to land was not expected but may occur, that the bank task Team Leader is consulted (b) The approved Land Acquisition Plan/Framework (if required by the project) will be followed
F. Toxic Materials	Asbestos management	(a) If asbestos is located on the project site, mark clearly as hazardous material (b) When possible the asbestos will be appropriately contained and sealed to minimize dust (c) The asbestos prior to removal (if removal is necessary) will be treated with a wetting agent (d) Asbestos will be handled and disposed by skilled & experienced professionals (e) If asbestos material is to be stored temporarily, the wastes should be securely enclosed and marked appropriately (f) The removed asbestos will not be reused
	Toxic / hazardous waste management	(a) Temporary storage on site of all hazardous or toxic substances will be in safe containers with composition, properties and handling information (b) The containers of hazardous substances should be placed in a leak-proof container to prevent leaching (c) The wastes are transported by specially licensed carriers and disposed in a licensed facility (d) Paints with toxic ingredients or solvents or lead-based paints will not be used
G. Affects forests and/or protected areas	Protection	(a) All recognized natural habitats and protected areas in the immediate vicinity of the project or exploited, all staff will be strictly prohibited from hunting, foraging, logging or other activities (b) For large trees in the vicinity of the activity, mark and cordon off with a fence and a sign system and avoid any damage to the trees (c) Adjacent wetlands and streams will be protected, from construction site run-off, by a sediment control feature to include but not limited to hay bales, silt fences (d) There will be no unlicensed borrow pits, quarries or waste dumps in adjacent areas.
ACTIVITY	PARAMETER	MITIGATION MEASURES CHECKLIST
H. Disposal of medical waste	Infrastructure for medical waste management	(a) In compliance with national regulations the contractor will insure that newly constructed health care facilities include sufficient infrastructure for medical waste handling and disposal, not limited to: <ul style="list-style-type: none"> ▪ Special facilities for segregated healthcare waste (including soiled instruments, sharps or fluids) from other waste disposal; and ▪ Appropriate storage facilities for medical waste are in place; and ▪ If the activity includes facility-based treatment, appropriate disposal options are available.
I Traffic and Pedestrian Safety	Direct or indirect hazards to public traffic and pedestrians by construction activities	(b) In compliance with national regulations the contractor will insure that the construction and construction related traffic regulated. This includes but is not limited to <ul style="list-style-type: none"> ▪ Signposting, warning signs, barriers and traffic diversions: site will be clearly marked of all potential hazards ▪ Traffic management system and staff training, especially for site access and egress ▪ Provision of safe passages and crossings for pedestrians where construction activities are taking place ▪ Adjustment of working hours to local traffic patterns, e.g. avoiding major traffic hours or times of livestock movement ▪ Active traffic management by trained and visible staff at the site, if required to ensure safe passage for the public. ▪ Ensuring safe and continuous access to office facilities, shops and residences, if the buildings stay open for the public.

PART 3 ENVIRONMENTAL MANAGEMENT PLAN							
Phase	What (Is the parameter to be monitored?)	Where (Is the parameter to be monitored?)	How (Is the parameter to be monitored?)	When (Define the frequency / or continuous?)	Why (Is the parameter being monitored?)	Cost (if not included in project budget)	Who (Is responsible for monitoring?)
During activity preparation							
During activity							

implementation							
During activity supervision							

Sample Environmental Management Plan for Center of Excellence

Possible Environmental Issues	Mitigation Measures	Monitoring Strategy and Contingency Measures
1. Air Emissions	<ul style="list-style-type: none"> • Lab staff will be provided with information and training on methods to minimize air emissions. • Procurement of equipment which is ODS free (refrigerator, A/C, fire extinguisher, etc.) and proper servicing of ODS containing equipment. • List of hazardous air pollutant sources and emissions and category will be provided to the laboratory. • A list of actual and potential emissions in the lab (fumes foods, stacks vents, etc.) will be prepared. 	<ul style="list-style-type: none"> • Biannual exposure assessment of air pollutants will be developed. • Periodic verification of control systems will be undertaken • Records of emissions will be kept and reviewed periodically by Bank supervision team and any other relevant authorities. It will be responsibility of EMS In charge for annual certification. • Regular inspection and maintenance of ventilation system.
2. Waste Water Discharges	<ul style="list-style-type: none"> • A comprehensive listing of sources and location of wastewater discharge will be prepared and maintained. • Appropriate operating procedure will be undertaken for minimization of wastewater (such as neutralizing predisposal treatment, etc.) • On-site septic tank systems or appropriate waste water treatment system depending on the waste water characteristics will be encouraged for implementation. After proper treatment waste water will be discharged in to existing municipal sewer line. • Lab personnel will be trained in minimization and management of 	<ul style="list-style-type: none"> • Periodic maintenance will be undertaken of the sewer system. • Periodic testing of lab procedures will be carried out to ensure compliance with regulatory measures. • Regular training will be provided to ensure waste minimization.

	wastewater discharges.	
3. Hazardous Waste	<ul style="list-style-type: none"> • Different types of hazardous waste stream such as unused chemicals, spent solvents, etc. will be identified for appropriate collection, transportation and disposal system. • Special segregation and disposal method will be adopted for used lead acid batteries and alkaline batteries • Training and awareness program will be imparted to laboratory staff for safe handling of hazardous waste. • Waste minimization procedure will be developed and followed. 	<ul style="list-style-type: none"> • Biannual assessment will be undertaken for hazardous waste. • 4 times/year periodic medical surveillance will be conducted for all employees. • Records of waste generation and disposal will be kept and reviewed on regular basis by the laboratory.
4. Radioactive Waste	<ul style="list-style-type: none"> • Radioactive waste will be identified, segregated and managed in accordance with current regulations and the facility radioactive materials and waste management plan. • Staff training on the radioactive materials and waste management plan carried out at least 2 times/year 	<ul style="list-style-type: none"> • Regular assessment and monitoring in accordance with the facility radioactive materials and waste management plan. • Plan updated annually, or when new relevant technologies or practices are introduced. • Once per year periodic medical surveillance will be conducted for all employees. • Records of waste generation and disposal will be kept and reviewed on regular basis by the laboratory.
5. Handling of Hazardous Chemicals	<ul style="list-style-type: none"> • Required precautionary measures (such as hand gloves, masks and apron) as per manufacturer requirements/recommendations for handling different types of chemicals to minimize potential chemical exposure when working with hazardous chemicals. • Appropriate labels for all hazardous chemicals, e.g. flammable and 	<ul style="list-style-type: none"> • Periodic personal exposure assessment will be undertaken for chemicals. Simultaneously, periodic medical surveillance program will be undertaken for all employees. • Periodic visual inspection of all labels, symbols and

	<p>combustible material, oxidizing material, poisonous material, for clear identification of risks and precautionary measures to be taken.</p> <ul style="list-style-type: none"> • Selection use and maintenance matrix for personal protective equipment will be developed for preventing direct contact with corrosives, carcinogens and irritants. • During reconstruction of proper ventilation/exhaust system will be designed to avoid exposure to vapors and fumes of hazardous chemical. • Appropriate radiation protection devices will be procured and used to work with radioactive chemicals. • Suitable spill containment procedure will be developed for different types of hazardous chemicals. • Training on First Aid measures will be organized to all employees. • Training on handling of hazardous chemicals will be provided to the laboratory staff. ‘Train the trainers’ program will be undertaken. 	<p>signs will be designed, followed and recorded by the laboratory.</p> <ul style="list-style-type: none"> • Compliance with regulatory measure will be undertaken by the Laboratory in charge. • Periodic maintenance and validation schedule will be prepared for checking effectiveness of the engineering control devices mitigation measures. • Records of all incidents/events related to handling of hazardous chemicals will be kept and reviewed periodically by the lab.
<p>6. Storage of Hazardous Chemicals</p>	<ul style="list-style-type: none"> • Procedure for segregation of chemicals will be developed and followed according to chemical classes and compatibility criteria. • Minimum inventory storage procedure of every hazardous chemical will be prepared. • Proper storage criteria for flammable, combustible and volatile chemicals will be identified. Filled and empty chemical containers will be segregated accordingly. • During reconstruction proper ventilation/exhaust system will be designed to avoid exposure to vapors and fumes of hazardous chemical. • Training program will be organized on proper storage and health effect for all employees. 	<ul style="list-style-type: none"> • Periodic inspection criteria and regular visual inspection schedule to be developed and implemented. • Periodic review will be carried out to procure safer alternatives for highly toxic, carcinogenic, reactive or mutagenic material. If available. • Periodic checks will be done of the ventilation system by the lab.

7. Disposal of Hazardous Chemicals	<ul style="list-style-type: none"> • Hazardous chemical/waste will be segregated at source and treated appropriately and stored in separate container. • Appropriate waste management system will be defined. • Lab personnel will be trained in proper waste management procedures. 	<ul style="list-style-type: none"> • Periodic monitoring of waste treatment and disposal procedures will be done by the local environmental protection authorities (TBC).
8. Fire and Explosion	<ul style="list-style-type: none"> • Proper selection and installation of fire fighting equipment in effective locations will need to be implemented. Required new technology (smoke sensors, thermocouple, and fire alarms, as required) will be installed. 	<ul style="list-style-type: none"> • Periodic inspection of fire prevention equipment will be established. • Emergency response plan will be upgraded periodically.
9. Sustainable Practices	<ul style="list-style-type: none"> • Water conservation measures will be taken to reduce water consumption. • Minimum energy utilization measures will be implemented. • Laboratory employees will be education and motivated in energy and water management practices. 	<ul style="list-style-type: none"> • An energy and water inspection will be carried out to identify current equipment use and associated cost by the laboratory in cooperation with the local authorities.

EXCLUSIONS

IFC Exclusion List:

- Production or trade in any product or activity deemed illegal under host country laws or regulations or international conventions and agreements, or subject to international bans, such as pharmaceuticals, pesticides/herbicides, ozone depleting substances, polychlorinated biphenyls (PCBs), wildlife or products regulated under CITES
- Production or trade in weapons or munitions
- Production or trade in alcoholic beverages (excluding beer and wine)
- Production or trade in tobacco
- Gambling, casinos, and equivalent enterprises
- Production or trade in radioactive materials (this does not apply to the purchase of medical equipment, quality control (measurement) equipment and any equipment where the World Bank considers the radioactive source to be trivial and/or adequately shielded).
- Production or trade in unbounded asbestos fibers. This does not apply to purchase and use of bonded asbestos cement sheeting where the asbestos content is less than 20%.
- Drift net fishing in the marine environment using nets in excess of 2.5 km in length
- Production or activities involving harmful or exploitive forms of forced labor/harmful child labor
- Commercial logging operations for use in primary tropical moist forest
- Production or trade in wood or other forestry products other than from sustainably managed forests
- Production, trade, storage, or transport of significant volumes of hazardous chemicals, or commercial scale usage of hazardous chemicals (includes gasoline, kerosene, and other petroleum products)
- Production or activities that impinge on the lands owned, or claimed under adjudication, by indigenous peoples, without full documented consent of such peoples

International Best Practice in Safety of Research Laboratories

Procurement / Transport

- Minimize acquisition / quantity of hazardous materials, minimize storage time needed
- Identify mechanism of waste disposal before acquisition
- For chemicals, have Material Safety Data Sheets (MSDSs) accessible/confine deliveries to areas that are equipped to handle them (and train relevant personnel)
- Ensure container is intact and appropriately labeled (US regulations detail how hazardous materials have to be identified, packaged, marked, labeled, documented and placarded)
- Transport in appropriate (secondary) containers
- Use triple packaging system for infectious and potentially infectious substances
- Adhere to international air transport regulations

Storage / Management

- Inventory should have name as printed on the container
- For chemicals: include molecular formula for further identification and to provide a simple means of searching chemicals; include CAS (Chemical Abstract Service) registry number for unambiguous identification of chemicals despite the use of different naming conventions
- Source
- Size of container
- Hazard classification, as a guide to safe storage, handling, and disposal
- Date of acquisition, to ensure that unstable chemicals are not stored beyond their useful life, and Storage location

Procedures

- Dispose of materials anticipated to not be needed within a reasonable time frame
- Use approved containers; make sure storage containers remain intact and sealed
- Dispose of chemicals prior to expiration date, monitor reactive chemicals
- Replace deteriorating labels before information is obscured or lost
- Follow regulations for safe storage in stockroom or lab
- Avoid storing chemicals on bench tops or lab hoods
- Store volatile chemicals in ventilated cabinet (near hood)
- If ventilation is not required, store in closable cabinet or on shelf with lip to prevent sliding
- Do not expose stored chemicals to heat or direct sunlight
- Observe all precautions regarding the storage of incompatible chemicals
- Provide vented cabinets beneath hoods for storing hazardous materials
- Use chemical storage refrigerators for storing chemicals
- Have fire protection system (sprinklers)

- Follow storage limits for flammable and combustible liquids
- Restrict access to storage facility

Protocols / Facilities for Use in Research

- Wear and use appropriate personal protection materials to minimize exposure
- Wash hands
- Reduce the possibility of creating splashes or aerosols
- Contain in biological safety cabinets operations that generate aerosols
- Use good housekeeping
- Use mechanical pipetting devices
- Promptly decontaminate work surfaces
- Never eat, ring, smoke, handle contact lenses, apply cosmetics, or take medicine in the lab
- Take special care when using sharps
- Keep lab doors closed when experiments are in progress
- Use secondary leak-proof containers to move or transfer cultures
- Decontaminate infectious waste before disposal
- Post appropriate warning signs
- Mark emergency equipment, maintain it, inspect it; list telephone numbers to call in case of accident
- Control access

For Radioisotopes

- Use only in designated areas
- Allow the presence of essential staff only
- Use personal protective equipment
- Monitor personal radiation exposures
- Use spill trays lined with disposable absorbent materials
- Limit radionuclide quantities
- Shield radiation sources
- Mark radiation containers with the radiation symbol, including radionuclide identity, activity, and assay date
- Use radiation meters to monitor working areas, protective clothing, and hands after completion of work
- Use appropriately shielded transport containers
- Remove radioactive waste frequently from the working area
- Maintain accurate records of use and disposal of radioactive materials
- Screen dosimetry records for materials exceeding the dose limits
- Establish and regularly exercise emergency response plans
- In emergencies, assist injured persons first

- Clean contaminated areas thoroughly
- Write and keep incident reports

For Animal laboratories

- Require good microbiological techniques
- Establish policies and protocols for all operations and for access to vivarium
- Establish appropriate medical surveillance program and supervision for staff
- Prepare and adopt safety or operations manual
- Post warning signs
- Decontaminate work surfaces after use
- Use appropriate biological safety cabinets or isolator cages; handle and decontaminate animal bedding and waste materials appropriately
- Transport material for autoclaving or incineration safely, in closed containers
- Treat, report, and record injuries

Training of Personnel

Employer develops Chemical Hygiene Plan containing (models available from U.S. government and from some professional societies)

- Employee information and training about the hazards of chemicals in the work area:
 - How to detect their presence or release
 - Work practices and how to use protective equipment
 - Emergency response procedures
- Circumstances under which a lab operation requires prior approval from the institution
- Standard operating procedures for work with hazardous chemicals
- Criteria for use of control measures
- Measures to ensure proper operation of fume hoods and other protective equipment
- Provisions for additional employee protection for work with select carcinogens and toxins
- Provisions for medical consultations and examinations for employees
- Labs should establish their own safety groups at the department level (include students and support staff)
- Labs should provide training in safety and waste management for all lab workers, including students in laboratory classes
- Labs should incorporate institutionally supported lab and equipment inspection programs into their overall health and safety programs
- Review exit / evacuation routes
- Know how to report fire, injury, chemical spill, or summon emergency response
- Know first aid
- Know location and use of emergency equipment such as safety showers and eyewashes
- Know location and use of fire extinguishers and spill control equipment (have appropriate kits readily

available)

- Lab personnel should establish ongoing relationships and clear lines of communication with emergency response teams
- Include information on safe methods for highly hazardous procedures commonly encountered by lab personnel that involve:
 - Inhalation risks
 - Ingestion risks
 - Risks of percutaneous exposures
 - Bites and scratches when handling animals
 - Handling of blood and other potentially hazardous pathological materials
 - Decontamination and disposal of infectious material

Segregation / Triage of Waste

Multihazardous waste – goal is reduction of waste to a waste that presents a single hazard.

- Consider frequency and amount of waste generated; assess risk
- Identify / characterize waste:
 - Physical description
 - Water reactivity
 - Water solubility
 - pH and possibly neutralization information
 - ignitability / flammability
 - presence of oxidizer
 - presence of sulfides / cyanides
 - presence of halogens
 - presence of radioactive materials
 - presence of biohazardous materials
 - presence of toxic constituents
- Minimize waste's hazards
- Determine options for management of hazards
- If appropriate, take steps to neutralize waste or render it non-hazardous
- When possible, select a single management option
- Establish procedures for dealing with unstable waste, or waste that requires special storage or handling
- Store safely:
 - Designated room or facility modified to contain the waste (with ventilation and effluent trapping)
 - Protect workers
 - Minimize risk of fire or spill
 - Minimize radiation levels outside of area
 - Consider compatibility of materials being accumulated (e.g., aqueous and non-aqueous)

waste should be separated)

- Give particular attention to the handling or cleaning of radioactive laboratory ware, and to the proper disposal of sharps.
 - Non-contaminated (non-infectious) waste can be reused or recycled or disposed of as general waste
 - Contaminated (infectious) sharps – collect in puncture-proof containers fitted with covers and treated as infectious; autoclave if appropriate
 - Contaminated material for decontamination by autoclaving and thereafter washing and reuse or recycling
 - Contaminated material for direct incineration

Disposal

No activity should begin unless a plan for the disposal of hazardous waste has been formulated

- Use appropriate disposal method for each category of waste
- Use appropriate containers
- Label and securely close waste containers
- Separate wastes as appropriate

For low level radioactive waste, options include

- Storage time for decay and indefinite on site storage,
- Burial at a low-level radioactive waste site,
- Incineration, or
- Sanitary sewer disposal

For biological waste, options include

- Disinfection
- Autoclaving
- For liquids, disposal in sanitary sewer; putrescible waste disposed of by incineration; needles and sharps require destruction, typically by incineration or grinding

Collection and storage of waste

- At satellite area near lab:
 - should be clearly identified, ventilated if necessary
 - determine whether to recycle, reuse, or dispose
 - hold here for less than one year; when containment volume limits reached, move to central accumulation area – package appropriately
- At central accumulation area:
 - separate according to compatibility, commingle solvents when appropriate

- label clearly, store in appropriate containers
- limit storage time to 90 days
- (ensure that employees are trained to handle waste materials as well as contingency planning for emergencies)
- When transporting, make provisions for spill control in case of accident; have internal tracking system to follow movement of waste
- Ensure that all necessary records have been generated (Quantities and identification of waste generated and shipped; Documentation and analyses of unknown materials; Manifests for waste shipping as well as verification of waste disposal; Any other information required to ensure compliance and safety from long-term liability)
- Disposal options:
 - Incineration – is method of choice for most wastes, but is most expensive
 - Normal trash – only where appropriate, must be clearly identified and appropriately labeled
 - Sanitary sewer – not commonly used; solutions must be aqueous and biodegradable, or low toxicity inorganics – make sure sewer doesn't drain into water supply inappropriate for waste disposal, and make sure waste is highly diluted
 - Release to the atmosphere – not acceptable; fume hoods must have trapping devices to prevent discharge to atmosphere
- If hazardous and non-hazardous wastes are mixed, entire waste volume must be treated as hazardous
- Preparation for transport to a treatment, storage, and disposal facility (TSDF)
- Waste generator must obtain assurance (in terms of documentation, permits, records) that provider is reliable

For infectious material

- Decontaminate, autoclave, or incinerate in lab
- Package appropriately (for incineration or for transfer to another facility for incineration)
- Protect against hazards to others to those who might come in contact with discarded items

Summary of Public Consultations

The final draft EMF was disclosed by the Ministry of Science (www.mne.gov.me) and Ministry of Education and Sports (www.mps.gov.me) on their websites on 18 October 2011 (see websites for text). MoS invited key stakeholders to the consultations, including government agencies, universities, research institutions and commercial companies, and environmental NGOs.

MoS conducted a stakeholder consultation on the EMF on 21 Oct 2011 at the Ministry offices in Podgorice. Notwithstanding the broad invitation, only the Ministry of Sustainable Development and Tourism (MSDT) participated in the consultation. The meeting agenda is attached below.

The main issues discussed concerned the environmental policies, laws and regulations relevant to HERIC. The MSDT representatives offered substantial comments on these aspects of the draft EMF, which have been adopted and incorporated by MoS in this final version of the document. Comments were received also from the Ministry of Agriculture and Rural Development and have also been adopted incorporated in the final document. MoS will include a detailed briefing on the EMF and the responsibilities of research grantees to applicants and representatives of candidate pilot Centers of Excellence under Component 3, Establishing a Competitive Research and Innovation Environment, during the project launch workshop.

Agenda
Stakeholder Consultation
HERIC EMF
Podgorice, 21 October 2011

- HERC overview
- EMF purpose
- Legal and policy basis (Montenegrin law and World Bank policies)
- Potential environmental impacts of HERIC
- Screening, EMP Preparation, Exclusions, Consultation and Monitoring
- Roles and responsibilities
- Discussion

FAO Code of Conduct and Technical Guidelines

If the CoE or any of the research grant sub-projects involve agricultural pest management, the organization would need to be guided by the **FAO Code of Conduct**.

The FAO has taken the lead among international organizations in promoting the safe use of agricultural pesticides and has adopted an **International Code of Conduct on Distribution and Use of Pesticides** (2002). First adopted in 1985, the Code establishes voluntary standards of conduct for all public and private entities engaged in, or associated with, the distribution and use of pesticides and serves as the globally accepted standard for pesticide management. The Code, in conjunction with its supplementary technical guidelines, has been instrumental in assisting countries to put in place or strengthen pesticide management systems. Revised in 2002, the Code embodies a modern approach, based on sound management of pesticides focusing on risk reduction, protection of human and environmental health, and support for sustainable agricultural development by using pesticides in an effective manner and applying IPM strategies. Among the technical guidelines to the **Code of Conduct** of possible relevance to HERIC are the following:

- **Guidelines on Good Practice for Ground Application of Pesticides** (2001), which offer practical guidance (i.e. on decision-making, safety considerations, application procedures, etc.) to those involved in using pesticides for food and fibre production and recognizes that because pesticides may put people, other life forms and the environment at risk, the decision to use a pesticide should only be taken when all other alternative control measures have been fully considered.
- **Guidelines on Good Practice for Aerial Application of Pesticides** (2001), which offer similar practical guidance (i.e. on decision-making, safety considerations, application procedures, etc.) to those involved in applying pesticides by air and again insist that a pesticide should only be used when other alternative control measures have been fully considered and its use is part of an integrated control programme.
- **Guidelines on Organization and Operation of Training Schemes and Certification Procedures for Operators of Pesticide Application Equipment** (2001), which provide a general framework outlining the need for training and assessment and confirmation of operator competence in order to improve the safety and efficiency of pesticides in farm use, recognizing that it is essential that those who apply pesticides be familiar, not only with the equipment they use, but also with the general principles of crop protection, IPM and the pesticides they apply.

The **Code of Conduct**, with its emphasis on risk reduction, promotes the use of less toxic pesticides; recommends the avoidance of pesticides whose handling and use require the use of personal protective equipment; and advises prohibition of the importation, sale and purchase of highly toxic and hazardous products, such as those included in the 2004 classification by the World Health Organization (WHO) of extremely hazardous (Ia) and highly hazardous (Ib) pesticides (see <http://www.inchem.org/documents/pds/pdsother/class/pdf>). The MoS will ensure that the project complies with the **FAO Code of Conduct**, particularly with respect to prohibiting the purchase or use of any extremely or highly hazardous pesticides identified by WHO.