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## **SPECIALIZED TRAINING IN ENVIRONMENTAL SECURITY, CLIMATE CHANGE AND LAND RESTORATION. MASTERS ERASMUS, EUROPE LIFELONG LEARNING PROGRAMME.**

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**ABSTRACT:** Erasmus 2009-2013 is a cooperation and mobility programme in the field of higher education that aims to enhance the quality of European higher education. Several European Universities have partnered to jointly undertake training initiatives in a Master Erasmus format (MSc), the subjects are Environmental Security and the Climate Change. Environmental Security programme examines the threat posed by environmental events and trends to individuals, communities or nations. It may focus on the impact of human conflict and international relations on the environment, or on how environmental problems cross state borders. The other programme is about climate change and land restoration is an innovative educational product based on recent research, which indicates that there are significant benefits of enhanced technology collaboration on climate change and degraded land web based application that is now in progress. This paper shows the objectives and the methodologies for teaching both international programmes.

### **1. INTRODUCTION**

The United Nations Climate Change Conference, Durban 2011, delivered a breakthrough on the international community's response to climate change. In the second largest meeting of its kind, the negotiations advanced, in a balanced fashion, the implementation of the Convention and the Kyoto Protocol, the Bali Action Plan, and the Cancun Agreements. The outcomes included a decision by Parties to adopt a universal legal agreement on climate change as soon as possible, and no later than 2015. One of the decisions adopted by COP 17 and CMP 7 regard to the land use, land-use change and forestry, and invites the Intergovernmental Panel on Climate Change to review and, if necessary, update supplementary methodologies for estimating anthropogenic greenhouse gas emissions by sources and removals by sinks resulting from land use, land-use change and forestry activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol.

Land degradation is a human-induced or natural process which negatively affects the productivity of land within an ecosystem. The direct causes of land degradation are geographically specific. Climate change, including changes in short-term variation, as well as long-term gradual changes in temperature and precipitation, is expected to be an additional stress on rates of land degradation.

- Climate change-induced land degradation is expected through;
- Changes in the length of days and/or seasons;
- Recurrence of droughts, floods, and other extreme climatic events;
- Changes in temperature and precipitation which in turn reduces vegetation cover, water resource availability, and soil quality;
- Changes in land-use practices, such as conversion of lands, pollution, and depletion of soil nutrients.

Adaptation-related projects on land degradation should apply incremental reasoning during the design and preparatory phase. The focus of projects should be on reducing the impacts of climate change on land degradation over and beyond measures that would normally be undertaken as a land degradation focal area activity. In line with the adaptation funding window that applies in this case (see below), maintaining and/or strengthening the resilience of ecosystems and communities to climate change by reducing the rates of land degradation (caused by climate change) is a priority. Projects should reflect dynamic, long-term response measures that can effectively contribute towards the reduction of climate change-induced land degradation.

## **2. PROPOSED MASTERS**

### **2.1. Environmental Security**

The MSc Programme in Environmental Security is a second cycle programme of higher education that follows a first degree or an equivalent level of learning leading to masters level offered by a higher education institution. The target groups are Graduates of Business and Planning faculties who intend to work in the infrastructure projects, graduates of environmental faculties who intend to specialise in environment disasters management, fire fighters who intend to specialise in wildfire prevention, graduates who intend to set up firms specialised in equipment production.

The goal of environmental security is to protect people from the immediate and long term ravages of nature, human-induced threats to nature, and deterioration of then natural environment (Barbu et al., 2007). It encompasses concerns about the negative impact of human

activities on the environment, direct and indirect effects of environmental scarcity and degradation, and the insecurity individuals and groups experience due to environmental change such as water scarcity, air pollution, and global warming. The field of environmental security gained little attention following its emergence in the mid-1970s. The largest knowledge gap is in how to approach complex environmental problems. 21st century environmental challenges requires that university graduates possess a broad range of skills that cannot be delivered by traditional university curricula based on the concept of the environment as a subject of 'hard' natural science. Many learning programmes in Europe see the role of environmental education as a means to provide a platform for sound scientific research rather than to introduce decision-making concepts and tools.

This postgraduate course aims to provide specific training and education for graduates wishing to specialise in the growing field of environmental security management.

The course is intended to prepare graduates for the employment markets they are likely to face. The MSc Environmental Security and Management is designed to meet the changing needs of employers as well as the changing nature of the employment market. The proposed programme addresses a need for further study opportunities in the environmental security field at postgraduate level. It provides a progression route for graduates of any related BSc programmes (e.g. those concerned with environment, management, security management) would benefit from completing this programme in preparation for a career in environmental security. Graduates will enhance their progression prospect within the organisations they work for due to the high competencies acquired.

The main educational aims of the MSc Environmental Security are to:

- Facilitate an integrated and critically aware understanding of the advanced study of environmental security and the changing context within the field.
- Prepare students for a career in the environmental security and management profession by developing analytical skills at a professional or equivalent level, or for further study in the area.
- Develop in students the ability to apply theoretical knowledge and understanding of environmental security and management to practice within the field, both systematically and creatively, to improve effectiveness and performance.
- Enhance students' lifelong learning skills and personal development so as to be able to work with self-direction and originality and to contribute to the field as a whole.
- In this Master, the target group are Graduates of Business and Planning faculties who intend to work in the infrastructure projects, graduates of environmental faculties who intend to specialise in environment disasters management, fire fighters who intend to specialise in wildfire prevention, graduates who intend to set up firms specialised in equipment production.

## **2.2. Climate Change and restoration of degraded lands**

Climate change is a significant and lasting change in the statistical distribution of weather patterns over periods ranging from decades to millions of years. The European Master in Climate Change and Restoration of Degraded Land modules programme – RECLAND - is an innovative educational product based on recent research, which indicates that there are significant benefits of enhanced technology collaboration on climate change and degraded land web based application. Innovative education and training materials will be made available and through this a significant impact is expected on staff and practitioners.

The aim of this Master is to modernise curriculum provision in partner countries by implementing a strategic approach for applied and unified credit transfer type of postgraduate education that prepares students for the regional and global postgraduate job market. To jointly develop and deliver a European Masters modules programme technology enhanced in MSc Programme in Climate Change and Restoration of Degraded Lands based on the “Tuning” project framework.

Its objectives are;

- To develop teaching materials that utilise learning objects.
- To develop modules tailored to technology assisted on Climate Change and Degraded Land.
- To develop a virtual learning environment that facilitates learning and assessment.
- To disseminate the results to a wider European audience.
- To exploit the results by organising the transfer to other practitioners.



**Figure 1.** Coordination meeting in Madrid

The study of climate change and degraded land requires the study of causal relations between human causes and land use changes. This second Master will dynamically link people from different disciplines and from outside academia to improve students' experience, which will enable them to learn to deal with multi disciplinary decision making solution. This allows for students not to be just inserted into one system or discipline, but simultaneously into a process of learning about the relation between education, political, social, ecological and economic environment.

Following discussion with people in the sector and from industry with the occasion of the United Nations Climate Change Conference (Durban,2011) the following modules curriculum was considered:

- Introduction to Climate Change and Land Degradation.
- Combating Climate Change by Restoration of Degraded Land.
- Afforestation as a tool for restoration of land and Climate Change mitigation.
- Waste Land Restoration
- Water Management and Planification
- Erosion and Hydrological Restoration



**Figure 2.** Master Erasmus Partners in Tenerife Meeting.

The innovative learning materials developed within the project will be made available to a wider community by using a Virtual Learning Portal and re-usable learning objects including audio and video-materials. The pedagogical methodology of delivering the learning content will be tailored to the specific content which is encouraging the acquisition of knowledge and formation of specific skills.

Finally this programme wants to develop an innovative joint continuing postgraduate education curriculum and coordinated continuing education organizational structure for partner countries represents good example of optimal and coordinated resource utilization. The proposed MSc modules programme will provide provision for continuing education and cover the shortage of skills and educational resources on Climate Change and Restoration of Degraded Land at European level.

For both Master programmes the partners are;

- University La laguna, Spain
- University Politécnia de Madrid, Spain
- Estonian University of Life Science, Estonia
- University of West Hungary, Hungary
- Bucks New University, UK
- Transilvania University, Romania

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