



COST is an intergovernmental framework for European Cooperation in Science and Technology established to initiate networking and coordination of nationally funded research activities on a European level. It facilitates bringing good scientists together under light strategic guidance based on networks, called COST Actions, centered around research projects in fields that are of interest to COST countries and those with reciprocal agreements with COST (Argentina, New Zealand and South Africa).

COST Action ES1104

Arid Lands Restoration and Combat of Desertification

COST Action ES1104 focuses on practical measures that can be used by practitioners, stakeholders and authorities to restore degraded drylands and manage their recovery. It will run from June 2012 to May 2016. This networking Action has its origins in the European Union but its remit is to galvanize action and innovation within and beyond EU borders. The action welcomes participation and collaboration in this endeavor to create a global 'one stop shop' for the dissemination of knowledge and solutions to people in arid lands, and also creates opportunities for education and innovation through Short-Term Scientific Missions and Training Schools.

Training School 4

Indicators of Desertification: early warning signs

19 – 23 May 2014 – University of Lisbon, Portugal

Background:

Desertification is an important threat to the sustainability of human wellbeing, and many of the countries most seriously affected by it are also the least developed. Evaluation of the impact of measures taken to control and mitigate desertification is therefore a priority issue. This training school will focus on indicators of desertification, including those recommended by the United Nations Convention to Combat Desertification, and other techniques developed as early warning tools.

Early warning indicators allow the prevention of desertification before it becomes irreversible. Ecological indicators can inform us about the health of dryland ecosystems and how close they are to a tipping point. In this training school we will show how ecological indicators based on plant and lichen functional diversity can be used as early warning indicators of desertification. In addition to classroom lectures, there will be practical classes and field trips to desertified areas in order to demonstrate the most important methodologies for assessing desertification indicators.

Each student will be expected to give a short presentation about the needs of their country in terms of indicators of desertification, so that the trainers can give them advice to take home. The training school will be delivered by Cristina Branquinho (Associate Researcher of the Faculty of Sciences University of Lisbon) and Lúcio do Rosário (National Focal Point of UNCCD) in collaboration and with trainers both from local and foreign research institutes.

Provisional Programme:

Day 1

Students will be introduced to the need for indicators; the different types of indicators and what they should be used for; the indicator models used by different organizations (UNCCD, OCDE, EPA, EEA); the advantages and limitations of using ecological indicators; and the theory and practice of using early warning indicators.

The 11 indicators of the UNCCD will be explained, and the trainees will be introduced to their limitations, and shown how to calculate some of them. An overview will be given of other meteorological indicators associated with droughts and desertification. Different approaches to the use of remote sensing information for evaluating trends in desertification in Mediterranean Europe, Africa and South America will be presented. In some ecosystems it is possible to interpret seasonal patterns in order to obtain productivity and phenological trends in space and time. The Portuguese forest inventory will be used as an example of the importance of obtaining data on land cover over time to evaluate trends in desertification and ecosystem processes.

Day 2

Students will be introduced to the application and development of the aridity index for different countries, the temporal and spatial resolution of this indicator, and methods for calculating it. In preparation for the field trip on day 3, the basic ecology of semi-arid areas will be presented together with the most important methodologies for assessing the functional diversity of plants and lichen. Skills for evaluating soil quality will be developed together with an explanation of the most important methods for applying them in the field.

Day 3

There will be an all-day field trip along a desertification gradient, starting in the coastal area and ending in the interior where the most desertified areas in Portugal are located. There will be practical demonstrations of methods for assessing indicators of soil quality and plant and lichen diversity, and visits to restoration projects where mitigation measures to combat desertification have been successfully applied.

Day 4

The use of early warning indicators will be addressed by showing the results of the *Desertwarning Project* concerning the diversity of plants and lichens. Other indicators of overall ecosystem functioning, such as the use of stable isotopes on seeds, will be demonstrated together with examples of restoration measures carried out in Portugal during the last 30 years; part of the day

will be devoted to the trainees giving presentations about the application of indicators in their countries, and the associated challenges and limitations.

Day 5

The morning will be devoted to a field trip to visit restoration projects; in the afternoon the training school coordinators will provide practical advice on the application of desertification indicators in their country of origin of the trainees.

Eligibility: Applicants should be graduate students, PhD-students post-docs, or early stage researchers enrolled in or affiliated to an Institution located in a COST country: Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Latvia, Lithuania, Luxembourg, Malta, The Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom and the former Yugoslav Republic of Macedonia.

Applicants from approved Near Neighbour country institutions are also eligible to apply: the Centre for Ecological-Noosphere Studies, Armenian National Academy of Sciences; Al Hussein Bin Talal University, Jordan; Ibn Zohr University, Morocco; Al-Quds University, Palestine; and the Institut des Regions Arides, Tunisia.

The interest and/or first-hand experience of applicants should fit with the topic of this training school.

Financial support: COST Action ES1104 is offering 12 places on the training school on a competitive basis. Successful applicants will be offered a maximum grant of €1000 as a contribution towards the costs of travel, accommodation and meals. The exact award offered will depend on the cost of travel as this differs considerably across eligible countries. Please note that the grant will be paid by bank-to-bank transfer **after** the course has been completed. It is the responsibility of each participant to provide adequate insurance cover (personal, travel and medical) for the whole duration of the training course and travel period.

How to apply: Send a letter of application stating your reasons for wanting to take part in the Training School to Cristina Branquinho (cmbranquinho@fc.ul.pt) by **1 May 2014**. The letter should be accompanied by the following documents:

- (1) a 1-2 page CV containing your personal information, current home and university/institution mailing addresses, e-mail, Skype name (if possible), university education background including current enrolment status, training/work experience, publications.
- (2) a 1 page letter of motivation stating why you would like to participate in this training school.
- (3) for PhD students only: contact details of your supervisors