

Thematic Actions

Coordinating Universities for the Proposal: UCM and UPM

Title of Action	Creation of a Centre for Research into Soil Degradation and Alternative Land Uses		
Participating partners	CIEMAT, UPM, UCM, CBGP	Other participants	
Personnel involved (indicate institution)	CIEMAT UCM-Faculty of Veterinary Sciences School of Forestry Centre of Biotechnology and Plant Genomics (UPM-INIA)		
Start date	1-1-2010	End date	31-12-2013
Cluster	Global Change and New Energies	Other clusters	
Areas of action	Research / Knowledge Transfer / Teaching Improvement and EHEA Deployment		
Location	Moncloa Campus		
Infrastructures involved	Existing laboratories and installations of the groups involved. Creation of the Support Centre with the new laboratories and installations detailed in this proposal.		
Keywords	Soil degradation; Biotechnology; Biorremediation; Fitotechnologies; Land use; Contamination; Molecular Biology.		
<p>Objectives:</p> <p>Today, soil loss and degradation is one of the most important environmental problems. Nevertheless, a correct diagnosis of our soils' health is much needed, especially after recent legal developments on soil conservation and recovery, such as RD 9/2005. In this respect, the different teams involved in this proposal – from CIEMAT, UCM, UPM and CBGP– possess an outstanding research record and apply a vast array of techniques to study soil problems. These range from the classic physico-chemical tools of the trade to biotechnology, genomics or microbiology, to cite a few. Their aim is to evaluate and to find optimal solutions to recover sites polluted by agriculture, forestry, mining or industrial activities. All the groups involved in this proposal have worked together previously, using a multidisciplinary approach to tackle key problems in the field. Such joint work would greatly benefit from the construction of the new joint centre, termed Centro de Apoyo a la Investigación en Degradación de Suelos y Alternativas de Uso (Centre for Research into Soil Degradation and Alternative Land Uses). This centre would favour the integration of:</p> <ul style="list-style-type: none"> • Tools to characterise, evaluate and monitor degraded soil (biosensors, FISH, microbiology, remote sensing, pollutant toxicity and availability, OMICS technologies, etc.). • Technologies to restore such soils (soil amendments, bioremediation, phytoremediation, etc.). • Evaluation of impacts in the soil-plant system (erosion, pollution, fires, climate change, etc.) as well as their consequences on soil biodiversity, both structural and functional. <p>The aforementioned centre would also promote a synergistic effect on the work of all groups, facilitating the access to resources that are presently dispersed. Moreover, regarding the publication of results and other diffusion events:</p> <ul style="list-style-type: none"> • We would have a common ground to organise events of mutual interest (research and teaching). • Specific courses might be organised, including Master's degrees at international level. • Workshops, seminars and/or conferences might also be organised. • Training would take place in an outstanding environment. <p>Finally, this initiative encourages the use of shared equipment and installations by all participants, avoiding current duplication of resources.</p>			



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<p>Description of the action:</p> <p>Creation of a centre with the following equipment:</p> <ul style="list-style-type: none"> • Laboratory of soil ecology and microbiology. • Microscopy room (SEM, confocal). • Pilot and pre-industrial applications experimental plant. • Laboratory of molecular biology. • Laboratory of rhizosphere studies. • Laboratory of physicochemical, biological and physiological assays on soil and vegetation. • Workstation facilities for geodata processing. • Cartography, GIS and remote sensing facilities. • Meeting and teaching rooms (courses, meetings, workshops, and seminars). 	
<p>Planned key results:</p> <p>The new centre will allow us:</p> <ul style="list-style-type: none"> • To implement and promote pre-existing collaborations among the groups involved in the proposal, by providing common research tools and space. The centre will promote joint, multidisciplinary approaches. These are required to solve the complex problems posed by the sites under study. Such conditions will foster the development of appropriate protocols and technologies to study and restore those sites, as well as the proposal, when necessary, of alternative, sustainable uses. The environment provided by this centre will also help to obtain results that meet international standards of scientific quality. • To bolster joint work among consolidated groups with complementary expertise, through the exchange of ideas, technologies and know-how. • To organise courses, seminars and similar events to divulge our results and advances. • To perform consulting tasks for companies and organisms of the biotech or environmental engineering sectors. 	
<p>Rationale for the action:</p> <p>All groups involved in this proposal have been working in the area of soil degradation and restoration over the past few years, with funding from competitive R&D grants and/or the private sector. Along the years they have established both lasting and ad-hoc collaborations on specific topics related to the proposal. The expertise of each group is essential to tackle relevant problems related to soil degradation (erosion, salinisation, pollution, anthropogenic impacts, etc.) and to propose viable solutions. Yet, none of the groups covers all the techniques and approaches that will be needed for this task, making it necessary to join efforts. We believe this is the only way to propose efficient solutions to the problem of soil loss and degradation. The creation of the Centre for Research into Soil Degradation and Alternative Land Uses will offer the opportunity, through the implementation of shared facilities, to perform pilot-scale work and tasks that cannot be afforded today by any group separately. Finally, it will also provide a common framework to teach and divulge the latest developments in soil conservation, evaluation, monitoring and restoration.</p>	
<p>International aspects:</p> <p>The groups involved in the proposal already have ample experience in collaborating with research groups abroad through joint research projects, participation in scientific meetings, personnel exchange and long-term stays in centres of excellence: UC Stanford, UC San Diego, West England University, and various EU Actions. This will help establish new collaborations and exchanges, as well as the participation of the centre in international initiatives.</p> <p>Furthermore, all the participants have experience in the organisation of international and national scientific events that can be used in future initiatives led by the new centre. The participants also have a wide experience in presenting their results in prominent international forums and publications. On a different level, we also propose to organise courses, workshops, conferences and meetings to divulge and transfer our results to interested parties.</p>	



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<p>Planned impact:</p> <p>This proposal aims at joining the individual efforts made so far by the participants, so that a propitious environment for permanent collaboration can be generated. In this respect a coherent, stable group of experts will be assembled with appropriate means to develop common strategies to solve key problems related to soil pollution. Such integration of capabilities under a common framework will undoubtedly favour their competitiveness to gather national and international funding. Creating a group of experts with the participation of highly rated institutions, such as CIEMAT, UCM and UPM, along with a singular centre such as the CBGP, greatly increases the chances of solving environmental problems related to soils. Moreover, it will provide the necessary equipment to conduct joint projects that cannot be undertaken individually.</p> <p>The proximity of the institutions involved in this proposal, the location of the new Campus, and the existence of previous collaborations among its members support the viability of this initiative.</p>	