IS.UPC – Research Institute for Sustainability Science and Technology

2014-2015 ANNUAL REPORT

UNIVERSITAT POLITÈCNICA
DE CATALUNYA
BARCELONATECH

INDEX

1. PRESENTATION

The Research Institute for Sustainability Science and Technology of UPC - BarcelonaTech is the responsible unit for promoting, coordinating and carrying out academic activities in the fields of sustainability science and sustainable technologies.

The Institute's mission is to generate technical and conceptual tools to create a more sustainable production and development model and to collaborate in the UPC's endeavor to provide scientific and technical support for human, social, cultural and economic progress.

The IS.UPC is active in higher education, research and innovation, technology transfer and promotion of sustainability culture.

Its main objectives are as follows:

- Opening up sustainability research to UPC groups and researchers, by coordinating and promoting multi and trans-disciplinary research projects.
- Organizing and promoting specific postgraduate courses and degrees (Master's degrees, PhD programmes and other specialized teaching activities) directly linked with the UPC research in the fields of sustainability science and sustainable technologies, as well as embedding sustainability in other UPC educational programmes.
- Making the UPC management, in itself, a source for research demands in sustainability and a field of study and experimentation.
- Disseminating the results of the research carried out at the IS.UPC, both to the university community and to the society as a whole, and sparking discussion about it.
- Encouraging the commitment and interaction of the UPC within society, and encouraging UPC´s support of civic demands for promoting progress towards more sustainable development models.

1.1. LETTER FROM THE DIRECTOR

The Research Institute for Sustainability Science and Technology of UPC – BarcelonaTech (IS.UPC) was created by the Generalitat de Catalunya, the Catalonian Government, in November 9th of 2010). Since its creation, it has been a landmark in Sustainability research.

Today, our institute assembles more than 200 professionals, including staff scientists, postdocs, PhD students, technicians, general research support staff, administrators and maintenance personnel, devoted to the well-functioning of IS.UPC. Despite the difficult economic situation that our country is currently facing, the IS.UPC has maintained its dynamisms, transforming, adjusting and improving to continue performing excellent science and attracting public and private competitive funding, both from national and international sources.

This Annual Report covers the activities of IS.UPC from September 2014 to August 2015. During this period, main efforts have focused on consolidating an interdisciplinary academic space within the UPC community to face the challenges of sustainable human development through science progress and technology innovation. The integration of economic, environmental and social aspects of technology, architecture and engineering, as well as the reference points of closing of cycles and systemic thinking, are some of the distinctive characteristics of the Institute research focus. Academic excellence, strategic international and local networking, and a trans-disciplinary approach to knowledge creation and dissemination are other key characteristics the Institute.

The IS.UPC has its own Master degree in Sustainability Science and Technology (2 years – 120 ECTS). Besides the PhD studies in Sustainability. (90 PhD students), and the support for interdepartmental PhD studies in Environmental Engineering (50 PhD students). With 18 PhD dissertations read in this academic year.

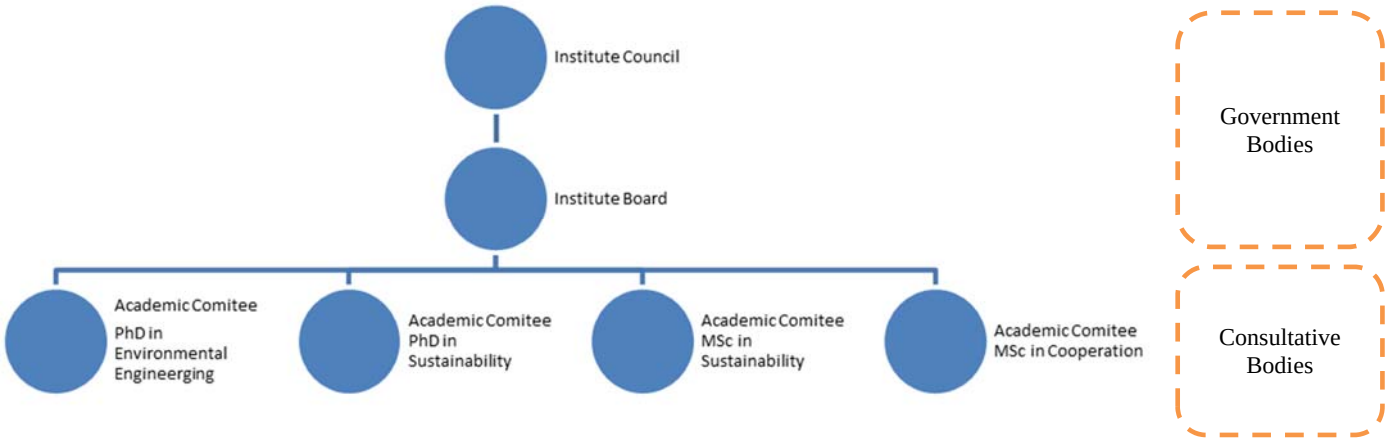
Finally, I would like to highlight the national and international recognition that our institute is achieving in sustainability science, with many of the research groups that constitute an outstanding international reference in their areas of expertise.

I would like to express my profound gratitude to the whole of the IS.UPC personnel, at every professional level for their dedication, motivation and enthusiasm!

Jordi Segalàs, director

2. ORGANIZATION STRUCTURE

2.1. ORGANIZATION CHART



2.2. INSTITUTE BODIES

Single-member bodies

Joan de Pablo Ribas	Director (until January 2015)
Jordi Segalàs i Coral	Director (since January 2015)
Enrique Velo García	Secretary (until January 2015)
Miriam Villares Junyent	Secretary (since January 2015)
Agustí Pérez Foguet	Deputy Director (until February 2014)
Jordi Segalàs i Coral	Deputy Director (between February 2014-January 2015)
Martí Rosas Casals	Deputy Director (since January 2015)

2.3. COLLEGIATE BODIES OF GOVERNMENT AND REPRESENTATION

Institute Board

Joan de Pablo Ribas	Director (until January 2015)
Jordi Segalàs i Coral	Director (since January 2015)
Enrique Velo García	Secretary (until January 2015)
Miriam Villares Junyent	Secretary (since January 2015)
Jordi Segalàs i Coral	Deputy Director (between February 2014-January 2015)
Martí Rosas Casals	Deputy Director (since January 2015)
Esperança Portet Cortes	Head of administration (until May 2015)
Xavier Àlvarez del Castillo	
Albert Cuchí Brugos	
Alejandro Josa García-Tornel	
Francesc Magrinyà Torner	
Jordi Morató Farreras	
Agustí Pérez Foguet	
Carles Riba Romeva	
Elisabeth Roca Bosch	
Antoni Roca Rosell	
Enric Trullols Farreny	
Miríam Villares Junyent	
Gemma Tejedor Papell	Representative of research trainees
Josep Lluis Moner Tomas	Representative of ICE-ISUPC administrative service Unit

Institute Council

Joan de Pablo Ribas	Director (until January 2015)
Jordi Segalàs i Coral	Director (since January 2015)
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	Deputy Director (until February 2014)
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Agustí Pérez Foguet	
Carles Riba Romeva	
Elisabeth Roca Bosch	
Antoni Roca Rosell	
Enric Trullols Farreny	
Miríam Villares Junyent	
Gemma Tejedor Papell	Representative of research trainees
Josep Lluis Moner Tomas	Representative of ICE-ISUPC administrative service Unit
Boris Lazzarini	Representative of administrative staff of ISUPC

2.4. COLLEGIATE BODIES FOR CONSULTATION

Academic Committee of the Master's in Sustainability Science and Technology

Jordi Segalàs Coral	Chair and Director (between February 2014-May 2015)
Martí Rosas Casals	Chair and Director (since May 2015)
Marta Prats Beltran	Secretary (until May 2015)
Alberto Cuchí Burgos	
Alejandro Josa García-Tornel	
Enrique Velo García	

Academic Committee of the PhD programme in Sustainability

Antoni Roca Rosell	Chair and Director (since July 2015)
José María Gil Roig	Secretary (until July 2015) and Chair (since July 2015)
Martí Rosas i Casals	Secretary (since July 2015)
Jordi Segalàs i Coral	(since July 2015)
Enrique Velo García	
Miriam Villares Junyent	

Academic Committee of the PhD programme in Environmental Engineering

Santiago Gassó Domingo	Chair and Coordinator Dept. of Engineering Projects
Ana Andrés Lleó	Secretary
Miquel Casals Casanova	Construction Engineering Dept.
Martí Crespí Rosell	Institute of Textile Research and Industrial Cooperation. of Terrassa
Joan de Pablo Ribas	Dept. of Chemical Engineering
Xavier Flotats Ripoll	Dept. of Agricultural Engineering and Biotechnology
Joan García Serrano	Dept. of Hydraulic, Maritime and Environmental Engineering
Andrés Navarro Flores	Dept. of Fluid Mechanics
Agustí Pérez Foguet	Research Institute for Sustainability Science and Technology
Jordi Romeu Garbí	Dept. of Mechanical Engineering
Teresa Vidal Llúcia	Dept. of Textile and Paper Engineering
Alejandro Josa García-Tornel	Representative of the Master of Environmental Eng
Josep Joaquim Masdemont Soler	Applied Mathematics I Department

2.5. TEAM

2.5.1. ADMINISTRATIVE AND MANAGEMENT TEAM

Esperanza Portet Cortes	Head of Administration
Marta Prats Beltran	
Araceli Adam Salvatierra (until May 2015)	
Ofèlia Alba Soca (until May 2015)	
Ana Andres Lleo	
Ma. Montserrat Añor Jávega (until May 2015)	
Carme Bernaus Garcia (until May 2015)	
Mercé Civit Payan (until May 2015)	
Isabel Darnell Martin (until May 2015)	
Ma. José Delgado García (until May 2015)	
Yolanda Delgado Rodríguez (until May 2015)	
Josep Maria Galabert i Pujol	
Felisa Lopez Lopez (until May 2015)	
Josep Lluis Moner Tomas	
Joaquim Morte Aixandr (until May 2015)i	
Maica Sanz Gomez (until May 2015)	
Sisco Villas Espiti (until May 2015)a	

2.5.2. RESEARCH AND TECHNOLOGY TRANSFER

Academic Staff	Joan de Pablo Ribas
	Agustí Pérez Foguet
	Jordi Segalàs i Coral
	Enrique Velo García
	Alejandro Josa García-Tornel
	Jordi Morató Farreras
	Albert Cuchí Burgos
	Antoni Roca Rosell
	Elisabeth Roca Bosch
	Francesc Magrinyà Torner
	Miríam Villares Junyent
	Xavier Àlvarez del Castillo
	Enric Trullols Farreny
Technical Staff	Pol Arranz
	Giné Garriga, Ricard
	Jiménez Fernández de Palencia, Alejandro
	Boris Lazzarini
	Josep Lluis Moner Tomas
	Tejedor Papell, Gemma
Project Leaders – Research	Miralles Esteban, Núria
	Perez Foguet, Augustí
	Segalàs Coral, Jordi

2.5.3. TEACHING

Faculty responsible for the organization and planning of master's subjets:

Barceló Garcia, Miquel

Cuchí Burgos, Albert

De Pablo Ribas, Joan

Etxeberria Larrañaga, Miren

Gassó Domingo, Santiago

Gil Roig, José María

Magrinya Torner, Francesc

Miralles Esteban, Núria

Morató i Farreras, Jordi

Oyón, José Luis

Pagès, Anna

Pérez Foguet, Agustí

Ramírez Ros, Rafael

Rosas Casals, Martí

Sánchez Vila, Xavier

Segalàs Coral, Jordi

Vidal López, Eva

Villares Junyent, Míriam

PhD programme in Sustainability

UPC researchers responsible for the mentoring and/or supervising of doctoral theses (2014/2015) were:

Aguado, Antonio
Alier Forment, Marc
Àlvarez del Castillo, Xavier
Alvarez del Castillo, Maria Dolors
Bacardit, Anna
Bosch, Ricard
Cadafalch, Jordi
Carrillo, Fernando
Cònsul, Ricard
Cuchí, Albert
de Felipe, José Juan
Domenech Lega, Bruno
Escribano, Beatriz
Ferrer Martí, Laia
Fonseca i Casas, Pau
Garcia Almiñana, Jordi
Garrido, Núria
Gil, José Maria
Kallas, Zein
López, David
Magrinyà, Francesc
Mayorga, Miguel
Montserrat, José
Morató, Jordi
Ollé Otero, Luis
Ortego, Maribel
Pérez, Agustí
Quera Miro, Manel
Riba, Carles
Roca Rosell, Antoni
Roca, Elisabeth
Rodríguez Cantalapiedra, Inmaculada
Rosas, Martí
Ruiz, Rafael
Segalàs, Jordi
Torres, Antonio Luis
Velo, Enrique
Vidal, Eva
Villares, Miriam
Xercavins, Josep

PhD programme in Environmental Engineering.

UPC researchers responsible for the mentoring and/or supervising of the doctoral theses (2014/2015) were:

Baldasano Recio, José M.	Josa, Alejandro
Barra Bizinotto, Marilda	Martí Gregorio, Vicenç
Bruno Salgot, Jordi	Mestres Ridge, Marc
Candela, Lucila	Miralles Esteban, Núria
Casals Casanova, Miquel	Navarro Flores, Andrés F.
Casas Pons, Ignasi	Perez Foguet, Agustí
Cortina Pallas, José Luis	Pérez García-Pando, Carlos
Crespi Rosell, Martí	Puigagut Juárez, Jaume
De Pablo Ribas, Joan	Riba Ruiz, Jordi-Roger
Escalas Cañellas, Antoni	Rius Carrasco, Antoni
Ferrer Martí, Ivet	Riva Juan, Maria Carmen
Flotats Ripoll, Xavier	Roca Ramon, Xavier
Gangolells Solanellas, Marta	Romeu Garbí, Jordi
Garcia Serrano, Joan	Sanchez-Avila, Francisco
Garfí, Marianna	Sierra Pedrico, Juan Pablo
Gassó Domingo, Santiago	Uggetti, Enrica
Gibert Agulló, Oriol	Valderrama Angel, César Albert
Giménez Izquierdo, Francisco Javier	Vázquez Ramonich, Enric
Gonçalves Ageitos, María	

2.5.4. UNDERGRADUATE TRAINEES

Number of master students with a training undergraduate scholarship:

Academic year 2014-15	
Master in Sustainability (in extinction)	0
Master in Sustainability Science and Technology	13
Total number of scholarships	**13 scholarships**

2.5.5. POSTGRADUATE SCHOLARSHIPS

Number of postgraduate scholarships in academic year 2014-15:

PhD in Sustainability	
FPI UPC-FPU UPC	3
FPU	1
PhD in Environmental Engineering	
FPI UPC-FPU UPC	4
FPU	2
FPI	1
FI	4
Total number of scholarships	**15**

3. FINANCIAL INFORMATION

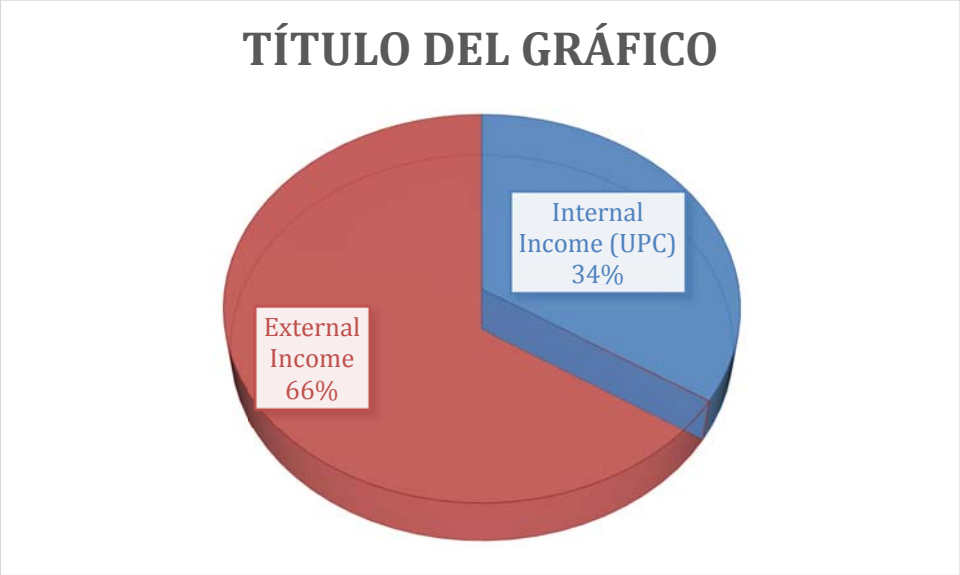
A description of IS.UPC financial accounts for the fiscal year 2012 is summarized in this section.

FINANCIAL ACCOUNTS

2015 OPERATIONAL INCOME (EUR)

	UPC	EUROPEAN COMISSION	CATALAN GOVERNMENT	SPANISH GOVERNMENT	PRIVATE ENTITIES	**TOTAL**
INTERNAL						**60.000**
Cap 2	5.000					**5.000**
2015 Sustainable Plan	55.000					**55.000**
EXTERNAL						**115.311**
Competitive Projects		94.366				**94.366**
Others			20.945			**20.945**
TOTAL	**60.000**	**94.366**	**20.945**			**175.311**

OPERATIONAL INCOME



4. UPC 2015 SUSTAINABILITY PLAN

Despite budgetary restraint and a decreased availability of resources, the UPC reaffirmed its commitment to sustainability by advancing in the application of sustainability criteria in all of its academic activities. Thus, it has maintained the objectives and actions planned in the second implementation stage of the 2011-2015 UPC Sustainability Plan (see 2012 Annual Report).

The IS.UPC's contribution to promoting and coordinating the Plan has been significantly affected by this reduction in the resources available, but it has nevertheless been able to present a methodological proposal for reviewing and concluding the Plan and to propose the foundations for it to be continued in a subsequent stage (2015-2020), and to implement and provide continuity in some of the key actions planned, as outlined below.

4.1. PROJECTS OF THE PLAN

Actions of teaching initiatives developed by the Institute of Sustainability are particularly significant in terms of their impact. The commitment of the UPC is visualized in the master`s degree courses and doctoral courses developed at the institute among others. Briefly the Institute of Sustainability offers the following courses:

- Master's degree in Sustainability,
- Doctoral degree in Sustainability and,
- Doctoral degree in Environmental Engineering

Additionally, the Institute realized the following initiatives:

Conservation of the Olla del Rei, the lake on the UPC campus in Castelldefels

The IS.UPC has promoted several environmental improvements on the campus:

- In 2012, the Government of Catalonia included the Olla del Rei in the Wetland Inventory of Catalonia (IZHC), whose boundaries failed to protect sensitive areas of great ecological value. On 16 May 2013, the IS.UPC presented a report justifying the conservation of the entire area, which was accepted by the General Directorate for the Environment, and it subsequently set the definitive boundaries that are now included in the official file in the Inventory.
- An official ceremony celebrating the inclusion and definitive boundary of the lake on the Baix Llobregat Campus in the Wetland Inventory of Catalonia was held in November 2013. Under the presidency of the UPC rector and the Catalan government's general director for the Environment, studies by Dr Ignasi Torre, *Els ocells de l'Olla del Rei* (Birds in the Olla del Rei), and the director of the IS.UPC Joan de Pablo, *Les actuacions de millora ambiental de l'Olla del Rei i el seu futur* (The environmental improvement of the Olla del Rei and its future),

were presented. The directors of the schools and the manager of the Institute of Photonic Sciences defended the values informing efforts to protect the Olla del Rei for teaching and research.

- The Olla del Rei is subject to water pollution episodes that have on occasion caused the death of fish and wildlife. To remedy the situation, the IS.UPC, in collaboration with the Metropolitan Area of Barcelona, prepared and presented the report *El sistema de drenatge de pluvials i sanejament a l'entorn del recinte universitari de Castelldefels* (The system of rainwater drainage and sanitation around the university campus of Castelldefels, by Martin Gullón, director of the Water Cycle Services of the Barcelona Metropolitan Area, and Joan de Pablo, director of the IS.UPC, 22 July 2013), which has been submitted to the Catalan Water Agency as the basis for a structural solution to the problem.
- In June 2013, the Catalan government's General Directorate for the Environment awarded a grant of €26,993.07, which allowed the UPC to run the following three initiatives to improve the campus lake.

  Action 1. Removal of invasive and exotic flora (pampas grass and giant cane) and fauna (turtles).

  Action 2. Installation of two barrier islands of floating macrophytes in the area that connects the lake to rainwater channels, in an effort to prevent water pollution episodes.

  Action 3. Installation of a fence of wood and rope to deter access to the protected area and to allow the fauna to rest.
- In June 2014, the IS.UPC presented a new project to take new actions for the recovery of the good ecological status of the Olla del Rei wetland, availing itself of the subsidy order of the Catalan government's General Directorate for the Environment, which has still not been resolved.

Sixteenth UPC Environmental and Sustainable Ideas Competition

The IS.UPC resumed the preparation and call for the sixteenth edition of the Competition, which had to be postponed in the two previous years due to lack of sponsorship. In addition to the UPC, the sponsors were the Government of Catalonia's Ministry of Spatial Planning and Sustainability, the Barcelona Provincial Council and the Metropolitan Area of Barcelona.

In view of the objectives set out in the previous edition of the Competition (see the 2012 Annual Report), two calls were organised: the university call for projects by bachelor's, master's and doctoral degree students at the UPC and the open call for members of educational communities, university graduates and social bodies.

The jury was appointed and mechanisms were put in place for the submission of projects, their assessment and the awards, which amount to a total of €8,000.

Support Plan for the Third Environmental Sector in Catalonia (2011-2014) and Citizen Commitment to the Sustainability of Barcelona (2012-2022)

- The IS.UPC, represented by its director Joan de Pablo, was designated by the Government of Catalonia as a member of the academic monitoring committee of the Support Plan and thus attended various meetings in which criteria were set to foster the strengthening of this key sector in the move towards a green economy.
- The IS.UPC pledged its allegiance to the Citizen Commitment and was involved in promoting the new Citizen Council for the Sustainability of Barcelona.

5. RESEARCH AND PROJECTS

This section details research projects, agreements and collaborations undertaken by IS.UPC researchers

5.1. RESEARCH AND KNOWLEDGE TRANSFER PROJECTS

FINALIZED PROJECTS

Consultancy to review the Conceptual Model of the Rural Water Supply and Sanitation Information System (SIASAR): Indicators, Indices, and Sanitation and Hygiene Module

In 2013 the World Bank funded an in-depth review of SIASAR, to provide concrete recommendations in order to make the SIASAR and the data it provides more useful for operational, investment and policy decisions. The final report focused on identifying main deficiencies of the tool and on developing key recommendations to support the implementation of SIASAR as an efficient tool for operational, investment and policy decisions. The recommendations were grouped in five work packages: WP1: Coordination at the regional and Work Package level // WP2: Communication and dissemination of Work Packages results // WP3: SIASAR Reliability Improvement // WP4: SIASAR Promotion and User Base Expansion // WP5: SIASAR Sustainability Promotion. According to the discussion with the countries, the most relevant recommendation included was the "WP3: SIASAR Reliability Improvement". The countries requested the WB assistance to implement this work package to improve the reliability of SIASAR. Thus, the assignment aims to support countries to increase reliability and feasibility of SIASAR as an efficient tool to support operational, investment and policy decisions. More specifically, the outputs were:

i) Support countries to review the conceptual framework, facilitating the discussion on basic forms, classification matrixes, index methodologies for data collection, validation and update, and indicators composition and visualization, with special focus on the Sanitation and Hygiene module; and

ii) Assist countries to review existing and potential tools for the visualization of indicators, and prioritize those to be presented in the different SIASAR interfaces

To do this, the study focused on assessing the validity of the data produced by the system based on needs and demands of sector stakeholders and potential users. The assignment included the following tasks: i) Revision of the conceptual framework in which aggregated indices (classification matrices) are founded, i.e. analysis of achieved results, and proposal for the improvement of the framework on the basis of reliability of system's outcomes and by identifying new potential indicators; ii) Review of indicators currently exploited that are created from available raw data, as well as the basic forms developed for data collection. Integral to this review is the proposal of different methodologies for data collection and data update; iii) Identification of

indicators that should be prioritized in the SIASAR web and / or in other tools and related services, and proposal of tools and alternatives for their visualization; iv) Review of ISSA index and proposals for improvement that would guarantee robustness and validity of this composite; v) Improvement of the Sanitation and Hygiene module of SIASAR, by facilitating discussion on this specific module and by proposing new methodologies for data collection, data integration and data visualization; and vi) Design of pilot activities to be implemented by the country teams and SIASAR partners to validate the conceptual model.

Scope: International

Agreement signed with: The World Bank - Water and Sanitation Program

Partners: Governments of Nicaragua, Honduras, Panama, Rep. Dominican Republic and Universitat Politècnica de Catalunya

Led by: Universitat Politècnica de Catalunya

Funded by: The World Bank - Water and Sanitation Program. In total, US$ 79,900

Dates: April 2014 to December 2014

Principal researcher: Pérez Foguet, Agustí

The Global Dimension in Engineering Education - GDEE -

The Global Dimension in Engineering Education -GDEE- is an initiative that aims to increase the awareness, critical understanding and attitudinal values of undergraduates and postgraduates students in technical universities related to Sustainable Human Development (SHD) and its relationship with technology. This is being dealt with by integrating SHD as cross-cutting issue in teaching activities by improving the competences of academics and through engaging both staff and students in initiatives related to SHD.

The expected results are: i) To increase competences of academic staff to integrate SHD as cross-cutting issue in teaching; ii) To create a network of academics for promoting the integration of SHD into technology studies; iii) To facilitate the connection between theoretical knowledge (lecturers and students from universities) with practice (through NGOs).

To achieve such outcomes, GDEE will produce and spread teaching materials, train teachers in SHD integration, promote networking among them, and link academics with NGOs through formal and non-formal actions at universities.

Scope: International

Agreement signed with: EuropeAid (Contract ref. DCI-NSAED/2012/280-929)

Partners: Universitat Politècnica de Catalunya (Spain), Universitat Politècnica de València (Spain), Universidad Politécnica de Madrid (Spain), Università degli Studi di Trento (Italy), Loughborough University (United Kingdom), ONGAWA (Spain), Training Centre for International Cooperation (Italy), Practical Action (United Kingdom), Engineers without Borders (United Kingdom).

Led by: Universitat Politècnica de Catalunya

Funded by: EuropeAid. Call: Non-State Actors and Local Authorities in Development - Raising public awareness of development issues and promoting development education in the European Union (EuropeAid/131141/C/ACT/MULTI).

Dates: February 2013 to January 2015

Principal researcher: Pérez Foguet, Agustí

Website: http://gdee.eu/

Building and strengthening ARA-Norte capacities for the planning and management of water resources in the basins of Cabo Delgado, Mozambique

The new Mozambican water policy (2007), is a step forward to improve country's policy and regulations relating to water, setting as priorities: i) to satisfy basic needs of water for human consumption; ii) to improve sanitation conditions, and iii) to develop an efficient use of water for economic development; iv) to guarantee water for environmental conservation; v) to reduce floods' and droughts' vulnerability, and vi) to promote regional integration. Main responsibilities recall on basin authorities. The aim of this project is to improve capacities of ARA-Norte (basin authority for the northern basins of the country) in the management of the internal watersheds of Montepuez Messalo, Megaruma Sea Side and in relation to: (1) Monitoring of resources water, (2) evaluation of water infrastructure, (3) environmental management, planning and control of the water resources, leading the participation and involvement of the involved stakeholders.

Scope: International.

Partners: ARA-Norte (Mozambique), Amphos 21 (Spain), Augas de Galicia (Spain), Universidade da Coruña (Spain) and UPC (Spain). Led by: Augas de Galicia.

Funded by: EuropeAid.

Start Date: 03.01.2012. **Estimated date of completion**: 09.01.2014.

Principal Researcher: Agustí Pérez Foguet

Andean Network of Graduate Studies in Integrated Water Resources (RAP-GIRH)

This project has identified the growing need for professionals to have an integrated approach to water management, interdisciplinary and regional guidance. The project aims to develop graduate programs with an innovative learning methodology, with a link with the labor, business and public, and methods that promote applied research and a permanent network of exchange and cooperation inter-university. Among others, include the following objectives:

- Strengthen educational programs on sustainability tools and mechanisms that promote active learning based on analysis of current social problems.
- To promote educational programs and research across the UPC considering the mass of water ecosystems as life support, beyond consideration as an economic resource and water planning.
- Promote partnerships with institutions (academic and non academic) working in the field of sustainability and cooperation.

Scope: International.

Partners: Wageningen University & Research centre (Holland), Universidad Mayor de San Simón (Bolivia), Universidad del Valle (Colombia), Universidad Central del Ecuador (Ecuador), Pontificia Universidad Católica del Perú (Peru), Universidad Nacional Pedro Ruiz Gallo (Peru) and Universitat Politècnica de Catalunya (Spain).

Led by: Wageningen University & Research centre.

Funded by: EuropeAid.

Start date: 01.04.2012. **Estimated date of completion**: 01.04.2015.

Principal Researcher: Núria Miralles

Erasmus Intensive Program: International Seminar on Sustainable Technology Development (STD)

The International Seminar on Sustainable Technological Development is a way of exchanging knowledge and information about an annual topic within the field of sustainability. It was developed during two weeks and conducted by professors from different European universities experts on future studies analysis (TUDelft, Chalmers UT, KTH, TUGraz among others). The constructive-learning activities were focused on the connections between technology development, environmental problems and societal change. The seminar developed case studies, round tables, practical visits, and other activities. This edition was focused on the production, distribution and consumption of sustainable clothing.

University-partners: KTH-Royal Institute of Technology, Universitat Politècnica de Catalunya, TU Delft, Chalmers University, Graz TU, Maribor University, University of Naples "Parthenope"

Funding agency: OAPEE-Unidad de Educación Superior 2013-1-ES1-ERA10-74528

Contract number: 3-ERA10-74528

Number of Agreement: 2013-1-ES1-ERA10-74528

Start date: 2011. Estimated date of completion: 2014

Contact persons: Jordi Segalàs, Gemma Tejedor

Further information:

https://is.upc.edu/seminaris-i-jornades/seminaris/std-2014

Establishing Modern Master-level Studies in Industrial Ecology (IEMAST)

The project aims to create a Master program that prepares engineers able to work on the design of technological systems, industrial and urban, industrial processes and consumer products, taking into account environmental problems and social and economic constraints in Azerbaijan, Belarus, Kazakhstan and Ukraine.

Scope: International.

University-partners: KTH-Royal Institute of Technology, Universitat Politècnica de Catalunya, TU Delft, Qafqaz University, National Aviation Academy, Belarussian National Technical University, Mogilev State University of Food Technologies, Baranovich State University, Kazakh National Technical University, Caspian State University

of Technology and Engineering, Atyrau Institute of Oil and Gas, National Technical University of Ukraine "Kiev Polytechnic Institute", Chernihiv State Technological University

Society partners: National Agency for Higher Education, Sweden, Association of power efficient engineering of Ukraine, Kazphosphate LLC, Baku City Department of Ecology and Natural Resources, Institute for Nature Management, National Academy of Science, Belarus

Led by: Universitat Politècnica de Catalunya.

Funding agency: EACEA

Contract number: 2-517346-TEMPUSIEMAST

Project number: 517346

Start date: 15-10-2011. **Estimated date of completion**: 14-10-2014

Project responsible: Olga Kordas (KTH), Jordi Segalàs at UPC.

Training Courses for Public Services in Sustainable Infrastructure Development in Western Balkans (SDTRAIN)

The project is designed to establish system for training of public authorities aimed at improving level of environmental expertise, facilitating good governance and sustainable infrastructure development in Western Balkan countries. To meet this overall objective, the project team will develop training programme for capacity building of the staff of public authorities in sustainable infrastructure, energy efficiency and good governance at partner Universities, that will be pilot in cooperation with EU teachers in BiH, Montenegro and Serbia; Key partner Universities teachers capacities in providing training in sustainable public infrastructure, will be improved at EU universities through retraining. A web-based toolkit will be developed as an interactive learning environment for training of public authorities. The project will ensure continuity of the training Programme and the web toolkit beyond Tempus Programme funding.

Scope: International.

University-partners: KTH-Royal Institute of Technology, Universitat Politècnica de Catalunya, TU Delft, Qafqaz University, National Aviation Academy, Belarussian National Technical University, Mogilev State University of Food Technologies, Baranovich State University, Kazakh National Technical University, Caspian State University of Technology and Engineering, Atyrau Institute of Oil and Gas, National Technical University of Ukraine "Kiev Polytechnic Institute", Chernihiv State Technological University

Society partners: National Agency for Higher Education, Sweden, Association of power efficient engineering of Ukraine, Kazphosphate LLC, Baku City Department of Ecology and Natural Resources, Institute for Nature Management, National Academy of Science, Belarus

Led by: Universitat Politècnica de Catalunya.

Funding agency: EACEA

Contract number: 2-TEMPUS 530530-SDTRAIN

Project number: 530530

Start date: 15-10-2011. **Estimated date of completion**: 14-10-2014

Project responsible: Olga Kordas (KTH), Jordi Segalàs at UPC.

5.2. AGREEMENTS AND COLLABORATIONS

FINALIZED AGREEMENTS AND COLLABORATIONS

Cross-cutting development education into technology studies in Barcelona

This project aims to provide a regional focus of the GDEE initiative on the Municipality of Barcelona. The specific objective is two-fold. On one hand, the aim is to adapt part of the GDEE teaching materials to the Catalan context, in order to engage academic staff from local universities. In addition, it also aims to bring the GDEE approaches closer to secondary school teachers in the field of technology, while promoting synergies between teachers from secondary and university level.

The main activities include i) the adaptation of teaching materials; ii) the development of two blended-learning courses - one per university-based staff and another one for secondary school teachers -; and iii) the implementation of workshops that bring together researchers from universities and practitioners from NGOs.

Scope: Local

Agreement signed with: Municipality of Barcelona

Partners: Universitat Politècnica de Catalunya (Spain)

Led by: Universitat Politècnica de Catalunya

Funded by: Municipality of Barcelona. Barcelona Solidària 2013 (29,977.22 EUR)

Dates: October 2013 to December 2014

Principal researcher: Pérez Foguet, Agustí

LCA to go PV

The goal of this project is to develop an adapted software tool addressed to Small and Medium Enterprises (SMEs) to be able to incorporate Life Cycle Analysis (LCA) into their product development and value chain proposition. IS.UPC collaborated with the Catalan partners Trama Tecnoambiental S.L. and Simpple to organize a dedicated workshop to present and discuss the LCA to GO tool with SMEs from the solar photovoltaics sector.

Scope: National

Agreement signed with: ITENE

Period: January 2014

Principal researcher: Pol Arranz

6. TEACHING

6.1. MASTER'S DEGREE IN SUSTAINABILITY SCIENCE AND TECHNOLOGY

The master's degree in Sustainability Science and Technology aims to provide students with advanced interdisciplinary training to facilitate understanding of interactions between society, the economy and the environment. Graduates will also have a sound understanding of scientific and technical options and trends for tackling key challenges for the sustainable development of current socio-environmental systems.

The course will train students to become entrepreneurs and agents of change in the field of sustainable development. Based on their specialisation in areas related to biodiversity, the environment, the built environment, services, the production system and information management, graduates will be able to design, implement and evaluate sustainable solutions in different fields of engineering and technology. Graduates will work in various cultural and professional contexts, applying a transdisciplinary approach based on scientific and technical rigour.

This master's degree has received the International **Master's Programme distinction** (2013 call) awarded by the Government of Catalonia's Agency for the Management of University and Research Grants (AGAUR).

The Master in Sustainability Science and Technology was validated by the Universities Council's Curriculum Validation and Accreditation Committee in July 2013.

Courses offered in academic year 2014-2015:

Mandatory courses:

Code	Subject	Professor
480011	Fundamentals of Economics, Environmental Economics and Ecological Economics	José María Gil
480012	Fundamentals of Engineering, Sustainability and Development	Agustí Pérez
480021	Fundamentals of Mathematical and Systemic Sustainability Modelling	Martí Rosas
480022	Fundamentals of Applied Statistics and Sustainability and Development Measurement	Agustí Pérez
480041	Fundamentals of Social Sciences and Approaches to Socio-Environmental Conflicts	Míriam Villares
480051	Fundamentals of Geosciences and Geographic Information Systems	Xavier Sánchez
480031	Fundamentals of Ethics, Business and Innovation	Miquel Barceló
480032	Fundamentals of Sustainable Management and Environmental Management Systems	Santiago Gassó
480042	Research-Action Workshop on Sustainability Science and Technologies (4)	Jordi Segalàs

Elective courses:

Code	Subject	Professor
480602	Construction and building construction engineering and technologies (1) (2)	Miren Etxeberria
480081	Urban Metabolism and Ecological Urbanism (2)	Francesc Magrinya
480091	Information and Communication Technologies	Eva Vidal
480111	Integral Management of Urban and Ecological Water Cycles	Núria Miralles
480092	Industrial Ecology (2)	Joan De Pablo
480071	Biodiversity and Socio-Ecological Systems (2)	Jordi Morató
480511	Urban and regional development (1) (2)	F. Magrinyà
290504	Social metabolism and City (3)	J. L. Oyón
480083	Regional and Transport Infrastructure Metabolism (2)	Francesc Magrinya
480131	Energy Efficiency in Building Construction	Albert Cuchí
480132	Building Construction Metabolism and Construction Projects	Anna Pagès
480152	Sustainable Design of Products and Services (2)	Jordi Segalàs
480171	Complex and Socio-Environmental Networks (2)	Martí Rosas
480521	Internacional Cooperation for Development (1)	Míriam Villares
2905063	Energy and City (3)	Anna Pagès
290504	Social metabolism and City (3)	J. L. Oyón
820767	Energy economy and comprehensive energy planning models (3)	Rodrigo Ramírez

(1) Subjects shared with Master's degree in Technology for Human Development and Cooperation

(2) Subjects taught in English language. Exams can be taken in Catalan, Spanish or English

(3) Electives from other Masters (available only acadèmic year 2014-15)

Defended TFMs

Metabolismo Energético de Comunidades en Transición en España
Análisis bajo criterios energéticos y sostenibles de un centro docente en las Franqueses del Vallès.
Transdisciplinary improvement on an isolated living model
Análisis de la efectividad del inhibidor en hormigones (convencional y reciclado) fabricados con agua de mar
Inventario de recursos energéticos de biomasa biodegradable en Sonora, México
Viabilidad económica de la producción y distribución agrícola local en la provincia de Barcelona
Análisis del estado actual del abastecimiento de agua de la Ciudad de Chihuahua como base para impulsar esquemas de utilización de agua de lluvia.
Análisis de las relaciones sociales; percepción y uso del espacio urbano en promociones residenciales con muros ciegos
Análisis de la viabilidad metabólica de los planes energéticos en Catalunya mediante la metodología MuSIASEM (Multi-Scale Integrated Analysis of Societal and Ecosystem Metabolism)

Análisis de Ciclo de Vida (ACV) social del Proyecto Reagritech (Regeneración y reúso del agua de escorrentía en parcelas agrarias mediante sistemas naturales de tratamiento)

6.2. MASTER'S DEGREE IN SUSTAINABILITY

The Master in Sustainability was substituted by the new Master in Sustainability Science and Technology, which was validated by the Universities Council's Curriculum Validation and Accreditation Committee in July 2013. Students had the option to adapt to the new study plan or finish their studies in their original plan of study. However, in the academic year 2014-15 the Master's offered the subjects according to the extinction plan in order to guarantee the graduation of the enrolled students.

Defended TFMs

Cradle to Cradle (C2C), como herramienta para la Educación en Ingeniería para el Desarrollo Sostenible (EESD)
Sistema d'hivernacles mediterranis amb cultius hidropònics en cobertes d'habitatges plurifamiliars existents.
Cosechado de microalgas cultivadas en lagunas de alta carga para el tratamiento de aguas residuales: efecto del almidón sobre la floculación y la producción de biogás
Emissions de Gasos d'Efecte Hivernacle en el sector Vitícola: Estudi comparatiu entre viticultura convencional i viticultura ecològica. Cas d'estudi: Catalunya oriental.
Potencial de las nanopartículas de plata inmovilizadas mediante la técnica de ultrasonido recubiertas de corcho granular como agente microbiano
Estudio del comportamiento estructural de construcciones de tierra: la técnica constructiva Earthbag

6.3. DOCTORAL PROGRAMME IN SUSTAINABILITY

Sustainability research involves specialists from different origins and backgrounds with a variety of disciplinary perspectives but with the common will to contribute to the development of society by providing future generations with the options and skills required to forge their own path.

The doctoral programme in Sustainability encompasses the research and courses that deal with the current challenges to sustainability: exhaustion, distribution and management of natural resources, including energy and water; climate change impacts and adaptation and mitigation mechanisms; modelling of socio-environmental systems and assessment of their evolution and development; poverty and imbalances in urban and rural environments; technological innovation and integrated concepts in construction, architecture and management of public services and the environment; and preservation and promotion of environmental and cultural heritage.

Sustainability science and technology is a highly interdisciplinary field of research that offers the opportunity to make original contributions in understanding and solving problems that affect the welfare and development of peoples and

societies, and in shaping a new perspective from which to analyse our reality, integrating approaches from different disciplines and embracing the very agents of change.

This programme, in which highly diverse research lines and fields of interest converge, may benefit from cross-disciplinary exchange between the different research lines. For this reason, in addition to the activities in which each research group is involved, a framework for discussion of research in progress is provided in the form of the Research Monitoring and Support Working Session. This session is held every academic year and is open to all doctoral candidates and lecturers who are interested in sustainability science and technology.

The doctoral programme in Sustainability was validated by the Universities Council's Curriculum Validation and Accreditation Committee, in accordance with the provisions of Royal Decree 99/2011, of 28 January, regulating official doctoral studies. The first academic year under Royal Decree 99/2011 was 2013-14.

PhD in Sustainability – Facts & Figures 2014-15

Access and enrolment	
New doctoral students	27
Doctoral students already enrolled	63
Total students	**90**
Defended thesis proposals / Research plans	
Thesis proposals	3
Research plans	14
Total thesis proposals / research plans defended	**17**
Doctoral graduates /read doctoral thesis	
Total doctoral graduates / read doctoral thesis	**8**

6.4. DOCTORAL PROGRAMME IN ENVIRONMENTAL ENGINEERING

The doctoral programme in Environmental Engineering provides doctoral students with advanced training and a high capacity for research in the field of environmental engineering, that is, having a knowledge and understanding of the impacts on the environment, both derived from human activities and natural processes, with the ability to evaluate the interactions between them, and the ability to propose and define possible actions to protect and recover the environment.

This programme is a multidisciplinary training framework in an international context that allows doctoral students to

obtain the scientific, methodological and technical skills to address the challenges of innovation and research that society demands in the field of environmental engineering. It can be considered the first doctoral programme in Environmental Engineering imparted in Spain. Additionally, it has the purpose of increasing internationalization and quality requirements defined by the "mention to excellence" of the PhD program in Environmental Engineering.

The doctoral degree in Environmental Engineering has been an interdepartmental programme since May 1999. The Institute for Sustainability Science and Technology, which began to contribute to the programme in the 2011-2012 academic year, manages the programme and provides coordination support.

On 15 November 2013 was announced in the Official Gazette of the Spanish Government the validation of the doctoral degree in Environmental Engineering by the Universities Council's Curriculum Validation and Accreditation Committee, in accordance with the provisions of Royal Decree 99/2011, of 28 January, regulating official doctoral studies.

PhD in Environmental Engineering – Facts & Figures 2014-15

Access and enrolment	
New doctoral students	10
Doctoral students already enrolled	40
Total students	**50**
Defended thesis proposals / Research plans	
Thesis proposals	2
Research plans	4
Total thesis proposals / research plans defended	**6**
Doctoral graduates /read doctoral thesis	
Total doctoral graduates / read doctoral thesis	**10**

7. DISSERTATIONS

7.1. DOCTORAL PROGRAMME IN SUSTAINABILITY

7.1.1 PhD theses read during academic year 2014-15

Arellano, Nelson
Thesis title: La Ingeniería y el Descarte Artefactual de la Desalación Solar de Agua.Llas Industrias de las Salinas, Sierra Gorda y Oficina Domeyko (1872-1907).
Supervisor: Dra. Antoni Roca Rosell
Reading date: 26/05/2015

Bosch González, Montserrat
Thesis title: Eficiència energètica en edificis d'ús docent en la ciutat mediterrània. Cas a estudi, ciutat de Barcelona
Supervisor: Dra. Inmaculada Rodríguez Cantalapiedra (Escola Politècnica Superior d'Edificació de Barcelona, UPC)
Co-Supervisor: Dr. Javier Álvarez del Castillo (Escola Tècnica Superior d'Enginyeries Industrial i Aeronàutica de Terrassa, UPC)
Reading date: 16/07/2015

Cubi Montanyà, Eduard
Thesis title: Energy Efficient Ventilation Strageties for Surgery Rooms
Supervisora: Dra. Núria Garrido Soriano (Dept. Màquines i Motors Tèrmics, UPC)
Co-Supervisor: Dr. Jaume Salom Tormo (Group Leader d'Energia Tèrmica i Edificació, Institut de Recerca en Energia de Catalunya)
Reading date: 19/12/2014

Lomeña, Monica
Thesis title: A Meta-evaluation of Sustainable Land Management Initiatives in Senegal.
Supervisor: Dr. Jordi Morató Farreras (coordinador Càtedra UNESCO de Sostenibilitat, Universitat Politècnica de Catalunya)
Reading date: 28/07/2015

Nasreldin, Osama Ahmed
Thesis title: Using Statistical Copulas to Measure Dependence in the Agrofood Sector.
Supervisora: Dr. Teresa Serra Devesa (Institut de Recerca i Tecnologia Agroalimentàries IRTA)
Ponent: Dr. José Maria Gil Roig (Enginyeria Agroalimentària i Biotecnologia, Escola Superior d'Agricultura de Barcelona, Universitat Politècnica de Catalunya)
Reading date: 26/01/2015

Pires Carneiro, Alex
Thesis title: Multi-criteria and Participatory Approach to Socio-Economic, Environmental and Institutional Indicators for Sustainable Water Use and Management at River Basin Level
Supervisor: Dr. Jordi Morató Farreras (coordinador Càtedra UNESCO de Sostenibilitat, Universitat Politècnica de Catalunya)

Reading date: 21/07/2015

Pons Pons, Marc
Thesis title: Climate change impacts on winter tourism in the Pyrenees and adaptation strategies
Supervisor: Dr. Martí Rosas Casals (Departament de Màquines i motors tèrmics - Escola d'Enginyeria de Terrassa, Universitat Politècnica de Catalunya)
Co-Supervisor (extern): Èric Jover Comas (Observatori de la Sostenibilitat d'Andorra)
Reading date: 07/11/2014

Salas Prat, Josep Maria
Thesis title: Complexitat Tècnica i Socioeconòmica de la Transició de Model Energètic. Una Aproximació Biomimètica a les Xarxes Intel·ligents de Transmissió d'Energia i Informació – "smart grid"
Supervisor: Dr. Ricard Bosch Tous (Departament d'Enginyeria Elèctrica - Escola Tècnica Superior d'Enginyers Industrials de Barcelona, Universitat Politècnica de Catalunya)
Co-Supervisor: Dr. Martí Rosas Casals (Departament de Màquines i Motors Tèrmics - Escola d'Enginyeria de Terrassa, Universitat Politècnica de Catalunya)
Reading date: 14/07/2015

7.1.3 Theses proposals defended during academic year 2014-15

Sistematización de la información para planes de acción en eficiència energètica en edificación residencial.
Validación y calibración de la simulación energética de edificios. La importancia del análisis de sensibilidad e incertidumbre.
Sustainability of the Agri?food System's Characterization with Food Sovereignty Framework and the Evaluation. Approach of the Major Threats

7.1.5 Research plans defended during academic year 2014-15

Consumos eléctricos de la ciudad de Loja - Ecuador y la incidencia del parque eólico Villonaco
Metodología para el diseño de màquines adaptadas a comunidades en desarrollo
Proyecto moderno y mediación con el lugar. Cali: Borrero, Zamorano y Giovanelli. 1950-1965
Building a decision-support methodology to define ecosystem services bundles and to analyze tradeoffs in diverse landscapes. Application to ecuadorian ecosystems.
Viabilidad de pequeños agricultores en cadenes de valor de mercado especializado. Un enfoque desde los medios de vida sostenibles y los riesgos.
Understanding food waste behaviours along the food supply chain - a multilevel approach.
La cultura como elemento transformador de la ciudad sostenible. Diseño y aplicación metodológica para el caso de Monterrey
Metodología de planificación de la electrificación rural mediante energías renovables en comunidades asilades.
Implementación de una plataforma para la sostenibilidad y escalonamiento de los proyectos sociales, ambientales y productivos de las organizaciones que hacen parte de las redes sociales apoyadas por CITMA
Detailed energy and comfort simulation of integral refurbishment of existing buildings in Catalonia

Análisis y Modelización de la evolución de patrones globales y regionales en los Conflictos Socio Ambientales. Aplicación a la Amazonía Norte Ecuatoriana.
La economía verde un eje transversal, en las dimensiones económica, social y ambiental del desarrollo, en la lucha contra la pobreza y la desigualdad y en pro de un desarrollo humano sostenible. Una agenda para el desarrollo nacional y local.
Estudi de la millora de l'eficiència energètica de la ventilació en sistemes de climatització amb l'ús de recuperadors de calor.
La diversidad en el contexto urbano como medida de la sostenibilidad. Aproximación al análisis de la ciudad desde la ciencia de los sistemas complejos y la ecología urbana.

7.2. DOCTORAL PROGRAMME IN ENVIRONMENTAL ENGINEERING

7.2.1 PhD theses read during academic year 2014-15

Badia I Moragas, Alba
Thesis title: Implementation, development and evaluation of the gas-phase chemistry within the Global/Regional NMMB/BSC Chemical Transport Model (NMMB/BSC-CTM)
Supervisor: Dr. Oriol Jorba i Casellas (Barcelona Supercomputing Center – BSC)
Co-supervisor: Dr. Santiago Gassó i Domingo (Projectes d'Enginyeria. ETSEIB, UPC)
Reading date: 12/12/2014

Chaperon, Wilson
Thesis title: Modelización 3D de la dispersión de residuos generados en pisifactorías marinas
Supervisor: Dr. Joan Pau Sierra Pedrico
Co-supervisor: Dr. Marc Mestres Ridge
Reading date: 17/06/2015

Garcia Almiñana, Daniel
Thesis title: WTEA - Millores de la Metodologia per al Desenvolupament d'Auditories Energètiques
Supervisor: Luisa F. Cabeza Fabra (Departament d'Informàtica i Enginyeria Industrial, Universitat de Lleida)
Reading date: 01/09/2015

Giannakis, Stefanos
Thesis title: Solar disinfection of secondary effluent and the subsequent bacterial regrowth: considerations, limitations and environmental perspectives
Supervisor: Dr. Antoni Escalas Cañellas
Co-supervisor: Dr. Efthymios Darakas
Reading date: 29/10/2014

Guevara Vilardell, Marc
Thesis title: Development of a high-resolution emission model for air quality modelling in Spain
Supervisor: Dr. José María Baldasano Recio (Projectes d'Enginyeria, UPC)
Reading date: 17/12/2014

Lopes Del Rei Passos, Fabiana

Thesis title: Microalgae conversion to biogas: Pretreatment methods to improve the anaerobic digestion of microalgal biomass grown in wastewater treatment systems
Supervisor: Dra. Ivet Ferrer Martí (Dept. Enginyeria Hidràulica, Marítima i Ambiental. UPC)
Co-supervisor: Dr. Joan Garcia Serrano (Dept. Enginyeria Hidràulica, Marítima i Ambiental.
Reading date: 12/12/2014

Lopes Roldan, Ramon
Thesis title: Integration of advanced off-line and on-line systems for the monitoring of surface and drinking water quality
Supervisor: Dr. Jose Luis Cortina Pallás (Enginyeria Química – ETSEIB, UPC)
Co-supervisor: Dr. Vicenç Martí Gregorio (Enginyeria Química – ETSEIB, UPC)
Reading date: 10/07/2015

Scaini, Chiara
Thesis title: Modeling strategies for volcanic ash dispersal and management of impacts on civil aviation
Supervisor: Dr. Arnau Folch Duran (Barcelona Supercomputing Center)
Ponent: Dr. Santiago Gassó Domingo (Departament de Projectes d'Enginyeria, Escola Tècnica Superior d'Enginyeries Industial i Aeronàutica de Terrassa, Universitat Politècnica de Catalunya)
Reading date: 18/03/2015

Soret Miravet, Albert
Thesis title: Air quality management: Assessing the impacts of on-road transport strategies and industrial emissions in urban areas
Supervisor: Dr. José María Baldasano Recio (Projectes d'Enginyeria, UPC)
Reading date: 18/12/2014

Sotres Fernandez, Ana
Thesis title: Microbial fuel cell running on high strength animal wastewater – Nitrogen removal strategies and microbial community characterization

Supervisor: Dr. Marc Viñas Canals (Institut de Recerca i Tecnologia Agroalimentàries IRTA)
Co-supervisor: Dr. August Bonmatí Blasi (Institut de Recerca i Tecnologia Agroalimentàries IRTA)
Ponent: Dr. Xavier Flotats Ripoll (Enginyeria Agroalimentària i Biotecnologia, Escola Superior
Reading date: 24/07/2015

7.2.3. Theses proposals defended during academic year 2014-15

Microbial fuel cells implemented in constructed wetlands
Optimización de la producción y cosecha de microalgas en fotobiorreatores para el tratamiento de aguas residuales

7.2.4 Research plans defended during academic year 2014-15

Generación de índices socioambientales multidimencionales para el planeamiento hídrico. Aplicación en la cuenca alta del Río Laja, Mexico
Numerical modelling of microalgae systems for wastewater treatment
Modelling of geochemical effects related to geological CO2 storage in deep saline
Contributions to the determination of thermal behaviour of façades in new buildings by means of quantitative IRT (Infrared Thermography)

8. PUBLICATIONS

8.1. SCIENTIFIC PRODUCTION

The research activities and production of ISUPC members are included in the following link:
http://futur.upc.edu/ISUPC

9. ACTIVITIES

9.1. RESEARCH SEMINARS AND WORKSHOPS

IS.UPC Research Seminari *The use of Virtual Worlds to teach humanitarian principles*

XIV Coloquio de Geografía, Turismo, Ocio y Recreación: Espacios Turísticos e Inteligencia Territorial

Speakers : Míriam Villares and Elisabet Roca

Date: 25th October 2014

Place: Universidad de Sevilla

Web: http://turitec.com/es/pdf/XIV%20COLOQUIO%20AGE.pdf

VIII Jornadas de Geomorfología Litoral

Speakers : Míriam Villares and Elisabet Roca

Date: 5th June 2015

Place: Univesidad Pablo Olavide

ICZM 2014 - 3rd International Symposium on Integrated Coastal Zone Management

Speakers : Elisabet Roca and Míriam Villares

Date: 14th-17th October 2014

Place : Antalya, Turkey.

Web: http://www.iczm2014.org/

CONAMA 2014. 12º Congreso Nacional del Medio Ambiente

Speakers Míriam Villares and Elisabet Roca

Date: 24th November 2014

Place: Madrid

Web:

http://www.conama2014.conama.org/web/generico.php?idpaginas=&lang=es&menu=86&id=895&op=view&tipo=C

CIDUI 2014. MODELS FLEXIBLES DE FORMACIÓ: UNA RESPOSTA A LES NECESSITATS ACTUALS

Speakers: Elisabet Roca and Míriam Villares

Date: 2nd-3rd-4th July 2014

Place: Tarragona

Web: http://cidui2014.cidui.org/

Seminari d'Experts sobre Canvi Climàtic i Turisme. Impactes, riscos i adaptació. Organitzat pel CADS (Consell Assessor del Desenvolupament Sostenible).

Speaker: Elisabet Roca

Data: 20th November 2014

Place: Barcelona

RESURBE Congres New challenges for transition to resilience and adaptation through community development.

Date: 11th and 12th November 2014.

Place: UPC North Campus.

The first encounter of RESURBE Series Events took place in Barcelona 11th and 12th November 2014. It was attended by renowned local, national and international institutions. This series of Events is powered by RECNET and its allies, in order to promote the exchange of knowledge and purposeful dialogue between key actors in urban transformation.

RESURBE is structured around six thematic working groups. The progress of each of them will be introduced and consolidated over the events scheduled in 2015 – 2016, , Bogotá (September 2015) and Mexico City (February 2016). These workshops are willing to link academia, business and local government.
The workshops revolve around the following topics:

Forum 1: Risk management, adaptation and resilience.
Forum 2: Methodologies, approaches and ICT tools for resilience and systemic eco-innovation.
Forum 3: Process design, strategic planning and urban and regional planning of socio-ecological systems.
Forum 4: Knowledge management and transfer for intangible assets and for appropriate technologies.
Forum 5: Circular economy, urban metabolism and socio-ecological systems.
Forum 6: Participative processes, co-design and co-evolution.

RESURBE aims to reach all audiences. To accomplish this it is planned to generate a collaborative portal of the Series of Events enabling education and dissemination of the work made by the working groups. Also it will provide a set of good urban practices of community resilience, publication of 6 books, promotion of research and mobility, courses for local governments and eventually spreading in some TV programs.

RESURBE II, International Conference on Urban Resilience, New actors and action on climate change.

Date: 17th and 20th September 2015.

Place: Universidad del Rosario, Bogota, Colombia.

The second in a series of forums that aim to share knowledge and support dialogue among key stakeholders in the transition process and policy to resilience and adaptation to climate change. It was attended by leaders in innovation for participatory urban development and urban transformation and broad participation of government agencies, universities, research groups and the population.

Among the conclusions drawn in the event they are:

Involve local communities from a holistic view on the definition of public policies that respect the historic decisions and joint project initiatives of socio-environmental change.
Reappropriate the sense of community and citizenship from a socio-ecological point of view, making integrated management of different spatial scales, at local and regional level.
Recognize the value of intangible heritage and identity elements in urban areas.
Generate links with all stakeholders with innovative and inclusive applications of science and technology to promote resilience at local and regional level.
Integrate the participation of the academy with all stakeholders in an accompaniment concerted decisions.
Communicate the issues on climate change and resilience, and developing education systems to promote integration in public policies.

9.2. PRESENTATIONS

Congress: WETPOL 6th International Symposium on Wetland Pollutant Dynamics and Control.
Title presentation: Regeneration of irrigation water and reuse of runoff and drainage water in agricultural plots by constructed wetlands.
Speaker: Lorena Aguilar – UNESCO Chair on Sustainability (Spain)
Date: September 2015

Annual Conference of the Constructed Wetland Association
Title presentation: Regeneration of irrigation water and reuse of runoff and drainage water in agricultural plots by constructed wetlands.
Speaker: Lorena Aguilar and Angel Gallegos – UNESCO Chair on Sustainability (Spain)
Date: September 2015

SER Conference 9th European Conference on Ecological Restoration

Title presentation: Constructed wetlands for diffuse pollution control from agriculture water runof.
Speaker: Jordi Morató – UNESCO Chair on Sustainability (Spain)
Date: August 2015

TIC@gro: Primer Workshop de Tecnologías de la Información y la Comunicación aplicadas a la Agricultura
Title presentation: ICT for the automation and control of constructed wetlands designed to treat agricultural runoff water polluted by nitrates.
Speaker: Jordi Morató – UNESCO Chair on Sustainability (Spain)
Date: June 2015

World Water Congres & Exhibition
Title poster presentation: Use of cork waste in constructed wetlands for chemical and microbiological pollutions control.
Speaker: Angel Gallegos – UNESCO Chair on Sustainability (Spain)
Date: September 2014. Portugal.

International Wetlands 2014 Conference: Wetlands Biodiversity and Services: Tools for Socio-Ecological Development
Title presentation: Constructed wetlands for diffuse pollution control of agricultural runoff.
Speaker: Lorena Aguilar and Angel Gallegos – UNESCO Chair on Sustainability (Spain)
Date: September 2014

9.3. AGREEMENTS AND COLLABORATIONS

El Paisaje del Riesgo Costero en el litoral catalán. La influencia del cambio climático (PaiRisClima)
The coastal risk landscape can be defined as the set of all the risks to which the coastal zone is exposed. This represents a holistic approach to the study of the hazards, consequences and / or damages, acting mechanisms including feedbacks and the perception of society.
This concept has been developed for the Catalan coast by the research team under the PaiRisC-M project where a conceptual model including main components of coastal risk was proposed. In that project, a first small-scale assessment was performed under current climatic conditions. Obtained results suggested that although the risk level along the coast could intensify significantly under the influence of climate change, territorial stakeholders paid no (or little) attention to this effect.
Within this context, the general objective of the project PaiRisClima is to evaluate the coastal risk landscape along the Catalan coast under different climate scenarios at regional scale. and propose risk management measures taking into account the effect of climate change.
The goal is to identify how the effect of climate change is propagated through the coastal system by influencing the different components. Its use will enable the manager to assess the relative importance of Climate Change in the different processes and consequences, assessing the need to include it when making decisions on risk management processes.

Scope: National
Partners: Universitat Politècnica de Catalunya
Led by: Universitat Politècnica de Catalunya
Funded by: Ministerio de Economia y Competitividad
Dates: January 2015 to December 2017
Principal researcher: Míriam Villares Junyent

Regeneration and reuse of runoff and drainage water in agricultural plots by combined natural water treatment systems (REAGRITECH).

The project aims demonstrate a method for recycling water resources at parcel scale, in order to optimize the resources for its best use in the ecosystem and therefore achieve a sustainable and integrated river basin, by improving the chemical characteristics of the reused water and, therefore improve the natural environment surrounding them.

Scope: Local
Agreement signed with: European Commission

Partners: Universitat Politècnica de Catalunya (Spain); Typsa Group S.A (Spain); and LEITAT Technological Center (Spain).

Led by: Universitat Politècnica de Catalunya

Funded by: DG Environment – LIFE+ Programme (2,167,886€)
Dates: January 2013 to December 2016
Principal researcher: Morató Farreras, Jordi

Integrated and sustainable management of cork waste generated in the cork industry (ECORKWASTE)

The project aims is the demonstration of the technical, environmental and economical feasibility of cork waste valorisation, according to the cork waste particle size. Cork waste with certain particle size will be used as absorbent material in wetlands, for the elimination of organic compounds in a wine industry wastewater treatment system. Other cork waste such as the used cork stoppers, cork waste that has reached to silting in the absorption process in wetlands and cork powder, will be used as substrate for energetic valorisation in a gasification process.

ECORKWASTE takes into account the waste management priorities established by the Waste Framework Directive 2008/98/CE and also the waste management aims for a Resource-Efficient Europe and the 7th Environmental Action Program. Besides, main targets of Directive 1999/31/CE about biowaste disposal in landfills are also tackled.

Scope: Local
Agreement signed with: European Commission

Partners: Universitat Politècnica de Catalunya (Spain); Typsa Group S.A (Spain); INNOVI (Spain); ICSURO (Spain); and CTM.

Led by: Universitat Politècnica de Catalunya

Funded by: DG Environment – LIFE+ Programme (1,903,898 €)
Dates: November 2015 to December 2018
Principal researcher: de Pablo Ribas, Joan

Participative strengthening of local development and adaptive capacities in vulnerable communities of Medellín. From the Moravia experience to the Camposanto Villatina Ecopark.

The project presented aims to promote local development and adaptive capacities in vulnerable communities, strengthening the social fabric by developing participatory socio-environmental processes to promote the use and maintenance of green spaces, and building capacities in the community for territorial management. All in order to reduce environmental risks, especially landslides.

The Project of the Eco-park Campo Santo – Villatina was established as a demonstrative experience that can help similar processes in other urban areas of Latin America.

Scope: International
Agreement signed with: City Council of Barcelona

Partners: Universitat Politècnica de Catalunya (Spain); UNESCOSOST Col – TdeA, Major of Medellin.

Led by: Universitat Politècnica de Catalunya
Funded by: Program Solidary Barcelona 2013 (216.950 €)
Dates: 2014 to 2016
Principal researcher: Morató Farreras, Jordi

Recovery of the area declared as protected soil due to risk in the sector Altos de la Estancia at the locality of Ciudad Bolivar

The project "Recovery of the area declared as protected soil due to risk in the sector Altos de la Estancia at the locality of Ciudad Bolivar" aims to combine efforts to develop and apply methodologies to promote and implement sustainable projects with the community through experience transfer, social and environmental actions and public awareness to strengthen the citizen ownership of the risk protection park of Altos de la Estancia.

Scope: International

Agreement signed with: Prevention and Emergency Care Fund (FOPAE)

Partners: Universitat Politècnica de Catalunya (Spain); Prevention and Emergency Care Fund (FOPAE); Botanical Garden of Bogota; and Tecnologico de Antioquia (TdeA).

Led by: Prevention and Emergency Care Fund (FOPAE)
Funded by: Prevention and Emergency Care Fund (FOPAE) (198.218 €)
Dates: 2013 to 2014
Principal researcher: Jorge Montoya & Jordi Morató

The project was selected among the top 20 global initiatives for risk management at the Risk Summit in Sendai, Japan (2015).

10. ANNEX

Academics with formal adscription to IS.UPC and research activity related:

- Àlvarez del Castillo, Xavier (http://futur.upc.edu/JavierAlvarezDelCastillo)
- Cuchí Burgos, Albert (http://futur.upc.edu/AlbertoCuchiBurgos)
- Josa García-Tornel, Alejandro (http://futur.upc.edu/AlejandroJosaGarciatornel)
- Magrinyà Torner, Francesc (http://futur.upc.edu/FrancescMagrinyaTorner)
- Morató Farreras, Jordi (http://futur.upc.edu/JordiMoratoFarreras)
- Pablo Ribas, Joan de (http://futur.upc.edu/JoandePabloRibas)
- Pérez Foguet, Agustí (http://futur.upc.edu/AgustiPerezFoguet)
- Riba Romeva, Carles (http://futur.upc.edu/CarlesRibaRomeva)
- Roca Bosch, Elisabeth (http://futur.upc.edu/ElisabetRocaBosch)
- Roca Rosell, Antoni (http://futur.upc.edu/AntonimariaClaretRocaRosell)
- Rosas Casals, Marti (http://futur.upc.edu/MartiRosasCasals)
- Segalàs i Coral, Jordi (http://futur.upc.edu/JordiSegalasCoral)
- Trullols Farreny, Enric (http://futur.upc.edu/EnricTrullolsFarreny)
- Velo García, Enrique (http://futur.upc.edu/EnriqueVeloGarcia)
- Villares Junyent, Miríam (http://futur.upc.edu/MiriamVillaresJunyent)