



Mapping of EU Member States' / regions' Research and Innovation plans & Strategies for Smart Specialisation (RIS3) on Bioeconomy

Task 3

Case Study Report EXTREMADURA, SPAIN

Contract: RTD/F1/PP-03681-2015

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INFYDE, SL

1. Short Regional Bioeconomy Profile

Name of the case region/country	EXTREMADURA
Member State	SPAIN
GDP – Euro per capita (2014)*	15 500
Total ESIF Research & Innovation per capita per year*	37.85
Total H2020 per capita per year*	0.66
Value Chain Approach to the Bioeconomy**	Biomass supply and Waste, Biomass processing and conversion, Crop-based primary production, Foods and beverages, Animal-based primary production, Marine-based primary production, Bio-energy and fuel from biomass
Thematic Focus of the Bioeconomy Approach**	Agro-Food, Bio-based Fuel and Energy, Fisheries and aquaculture, Forestry and Wood, Crop Production, Horticulture, Agricultural residues and bio-energy crops
Research and Innovation Fields highlighted for the Bioeconomy**	Biology, Biotechnology, Chemistry, Life Sciences, Nano Technologies, Biology, Biotechnology, Chemistry, Life Sciences, Nano Technologies, Animal health, Veterinary sciences, Agronomy and crop sciences, oenology, etc., Forestry sciences
Bioeconomy Activity Level**	Low
CASE STUDY SUMMARY	
Bioeconomy Approach	Agro-food, agricultural residues and bioenergy crops.
Bioeconomy Ecosystem	Centred around agro-food and natural resources: Research and innovation entities: CTAEX, University of Extremadura, FUNDECYT -PCTEX, Energy Cluster, Tourism Cluster and Cluster of Cork, Extremadura Government and bioeconomy related ministries; Extremadura Avante and research and experimental development in biotechnology companies. Agri-food industry, energy sector, tourism, health and ICTs.
Bioeconomy Policy Support	RIS3 Extremadura; Fifth RTD Regional Plan of Extremadura 2014–2017; Sixth RTD Regional Plan of Extremadura 2017–2020 (not yet published); Spain – Rural Development Programme (Regional) Extremadura; Regional Bioenergy Plan 2015–2020
Successful initiatives and Good Practices	Hidronatura; Labpole; SAVECROP; COMFOREST; WALEVA; SYMBI; iCirBus-4Industries; FERTINOVA.
Main Needs, Gaps and Bottlenecks	More regional support needed; more hybridisation among sectors; more critical mass in the scientific sector; application of new models of sustainable exploitation needed; sustainable use of natural resources; sustainability of primary production.

* Source of the data: S3 – Regional Viewer: <http://s3platform.jrc.ec.europa.eu/synergies-tool>

** Data collected by this Study project in Task 1.

2. Regional Bioeconomy Ecosystem

2.1 Origin of Interest of the region in the Bioeconomy

According to the “Regional Innovation Scoreboard 2016” the Extremadura Region is a moderate innovator. However, since the S3 implementation, Extremadura presents a strong commitment towards sustainable development and green growth. Among important and recent initiatives (November 10, 2016, Cáceres) is the recent celebration by the Board of Extremadura with FUNDECYT–PCTEx and the Innovation Office of a Forum on Smart Specialization, financing and innovation in the company – “RIS3 Extremadura Forum 2016”¹ where among topics were debated the green economy trends in the driving sectors of Extremadura like agri–food industry, health and energy.

Another aspect that defines the origin and the trends of today’s bioeconomy in Extremadura can be considered the Extremadura scientific production that during 2009–2013 has been focused on agronomy and biological science in a proportion of 9.18% and biochemistry, genetics and molecular biology in 8.36%². In addition to these data, of importance is the intensive participation of the researchers from Extremadura in areas like Chemistry, biochemistry and biotechnology (30%), biology and ecology (18%), eco–design and new materials (11%)³.

However, the origins and the interest on Bioeconomy in the Extremadura Region starts from the endowment with natural resources and the real potential for bioeconomy development based on natural resources. In this context, Extremadura has 8,1 % Natura 2000 spaces of the total Spanish protected spaces and that represent 30.2% of the total surface of Extremadura⁴. Besides, the agri–food industry presents high coefficient of specialisation that demonstrates the potential for the bioeconomy in Extremadura. Additionally, Extremadura enjoys important hydric resources and ecological surface (the last mainly concentrated in Badajoz).

On the other side, and although, not very significant, in 2014 the R&D expenditure in biotechnology was around 0,2% of the total national, the recent success in Biotechnology and R&I (projects and initiatives to be further presented) in

¹ FUNDECYT.

<http://www.fundecyt.es/index.php?pagina=2&seccion=28&categoria=1¬icia=128&idioma=es#.WC66RfnhCUk>

² RIS3 Extremadura, calculated from SCOPUS data

³ RIS3 Extremadura, calculated from SCOPUS data

⁴ (<http://www.hoy.es/extremadura/201607/28/medio-ambiente-presenta-proyecto-20160728130443.html>).

Bioeconomy demonstrates a clear commitment and capacity to overcome these obstacles.

In strategic terms, also, the bet and the commitment for the bioeconomy can be understood from the main strategic documents of the region like:

- Regional Strategy for Research and Innovation for Smart Specialisation for Extremadura (Extremadura S3 Strategy 2014–2020) that implicitly tackles the bioeconomy issues;
- Fifth RTD Regional Plan of Extremadura 2014–2017 that emphasizes the applied and oriented R&D&I on agri–food industry and natural resources´ efficiency;
- Spain – Rural Development Programme (Regional) Extremadura.

Additionally, the General Secretary of Science, Technology and Innovation, Jesús Alonso, in his presentation “Extremadura priorities in their RIS3 on Bioeconomy” emphasized the regional capacity for the bioeconomy development due to environmental biodiversity, important water resources, around 28 research groups and 289 researchers for the bioeconomy.

Since the agri–food sector is considered a pillar of the Extremadura economy, major number of support programmes are oriented towards the agri–food sector. Therefore, the interest for the bioeconomy and the rising research capacity in this area. Here, in support to the R&I in Bioeconomy, in the Fifth RTD Regional Plan of Extremadura 2014–2017, the R&I priority lines are defined for the agri–food sector and namely food quality; food and health; food security; Agri–food technology and Agricultural, livestock and forestry production.

Another important factor is the increasing trend of University of Extremadura patent requests in areas such as medical or veterinary science, food or food, hunting, forestry, fishing, breeding and capture⁵.

2.2 Bioeconomy Stakeholders

In the following table are concentrated some of bioeconomy key–stakeholders:

Type	Entity	Some initiatives/projects/objectives/research lines
Ministries	Department of Agriculture, Rural Development,	Citizen Green Economy Strategy. Extremadura 2030. ⁶

⁵ Europa Press. Extremadura. “La UEx aumenta un 129% las solicitudes de patentes y modelos de utilidad”. <http://www.europapress.es/extremadura/noticia-uex-aumenta-129-solicitudes-patentes-modelos-utilidad-20160509195926.html>

⁶ Extremadura Government. <http://www.gobex.es/comunicacion/noticia&idPub=19583>

	Environment and Energy	
Universities	Extremadura University.	Promotion of business innovation through Innovative Public Procurement instrument ⁷ .
Companies and Clusters	Cluster of Energy	R&D trends identification: new technologies; regional, national and international consortium; public and private partnerships; R&D&I public aid; Conventions and collaborations, technological centers and international entities ⁸ .
	Cluster of the Cork (ASECOR)	Strategic Plan for the Cork Sector. Action 6.2.1. Increase in the production value added (diversification and finishing of products) ⁹ .
	Tourism Cluster of Extremadura (Cluster del Turismo de Extremadura)	Strategic Plan AEI Tourism Cluster of Extremadura 2013-2016; Research collaboration with the University of Extremadura, project "La gastronomía de alta gama, de lujo o de calidad, como eje potenciador del turismo cultural y de sensaciones en Extremadura" ¹⁰
Public institutions supporting sectors like agriculture, Fisheries, SME, Research, Innovation)	The Center for Scientific and Technological Research of Extremadura (CICYTEX)	Affiliated centres: <ul style="list-style-type: none"> - Institute of Cork, Wood and Charcoal (Instituto del Corcho, la Madera y el Carbón (ICMC)); - Agroalimentary Technological Institute of Extremadura (Instituto Tecnológico Agroalimentario (INTAEX)); - Agricultural Research Institute "La Orden-Valdesequera" (Instituto de Investigaciones Agrarias Finca "La Orden-Valdesequera"); - Center for Ecological and Mountain Agriculture (Centro de Agricultura Ecológica y de Montaña)¹¹.
Technology Parks	FUNDECYT-PCTEX ¹²	Projects: <ul style="list-style-type: none"> - SYMBI. "INDUSTRIAL SYMBIOSIS FOR A RESOURCE EFFICIENT ECONOMY" (http://www.interregeurope.eu/symbi/) - MITTIC, Technological Modernisation and Innovation based on ICT in strategic and traditional sectors (http://mittic.gobex.es/) - EcooEse - Cooperativas de Servicios Energéticos en

⁷ SDCC (2015). "La UEx pionera en el desarrollo del instrumento de Compra Pública Innovadora en Extremadura". <http://culturacientifica.unex.es/index.php/en/239-la-uex-pionera-en-el-desarrollo-del-instrumento-de-compra-publica-innovadora-en-extremadura>

⁸ Cluster of Energy. <http://www.energiaextremadura.org/areas-de-trabajo/i-mas-d-mas-i/>

⁹ ASECOR. <http://www.asecor.com/index.php?lang=es>

¹⁰ Tourism Cluster of Extremadura (Cluster del Turismo de Extremadura). <http://www.clusterturismoextremadura.es/>

¹¹ CICYTEX. Affiliated centers to CICYTEX. <http://cicytex.gobex.es/en/centros/>

¹² <http://www.fundecyt.es/>

		Extremadura (http://www.ecoese.es/) – DESUR (http://www.desur.eu/)
Group of companies	Extremadura Avante	Services: business creation; support for innovation in companies; internationalization; industrial and business infrastructures; financing instruments ¹³ .
Research and Experimental Development in Biotechnology Companies in Extremadura	BIO RCC CONSULTORES SL	Studies and research in agricultural production, commercialization and new crops development (http://bio-rcc-consultores.pymes.com/)
	BIOBEE TECHNOLOGIES S.L.	“Design of cost- and energy-efficient integrated bioimpedance-based solutions, mainly for the fields of healthcare, food industry, veterinary and civil engineering” (http://www.biobeetechnologies.com/)

2.3 Bioeconomy – strategies, plans and projects

Document	On or related to the bioeconomy....
RIS3 Extremadura	Bioeconomy is implicitly found in the RIS3 Extremadura: <u>Priority:</u> Resource efficiency <u>Sectors:</u> Agriculture, food sector, energy Scientific and technology domains associated to R&D&I projects: Agronomy, Biology and Ecology; Chemistry, Biochemistry And Biotechnology; Ecodesign And New Materials; Electronics And Automatics; Software Engineering And Computers.
Fifth RTD Regional Plan of Extremadura 2014-2017	<u>Among strategic actions:</u> 1. Extremadura Bioenergy Plan, 2015-2020. 2. Savings plan, energy efficiency and renewable energies for municipalities.
Spain - Rural Development Programme (Regional) Extremadura	5th Priority. P5. N13 Enabling the energy independence of Agricultural holdings.
Strategy of sustainable development of Extremadura. 2011	– STRATEGIC LINE 1. CLIMATE CHANGE. Agricultural waste program STRATEGIC LINE 2. WATER RESOURCES. Irrigation Consulting Network (REDAREX) STRATEGIC LINE 3. NATURAL HERITAGE AND BIODIVERSITY. Strategic Program for the Sustainable Use of the Natural and Forestry Environment; Fisheries and Management Habitat of Ribera; Aquaculture.
Estrategia Economía Verde	Commitment towards the green and circular economy following the Commission guidelines

¹³ Extremadura Avante. <http://www.extremaduraavante.es/index.php/extremadura-avante/que-hacemos>

Ciudadana. Extremadura 2030	for "smart, sustainable and inclusive growth" ¹⁴ .
The Integrated Plan for Waste of Extremadura 2009-2015	It has been elaborated by the Department of Industry, Energy and Environment of the Extremadura and among bioeconomy related objectives are: <ul style="list-style-type: none"> - "Take measures to promote the selective collection of bio-waste for composting and digestion." - "Promote R&D&I programs aimed at optimizing treatments, selective collection and reduction in waste generation."¹⁵
Projects	<p>INTERREG EUROPE:</p> <ul style="list-style-type: none"> - SYMBI (Industrial Symbiosis for a Resource Efficient Economy)¹⁶ <p>FP7 Projects¹⁷:</p> <ul style="list-style-type: none"> - AGRFORWARD: AGRoFORestry that Will Advance Rural Development (FP7-KBBE-2013-7); - EcoDry: Sharing Best Agroecological Practice for Resilient Production Systems in Dryland and Drought Conditions (FP7-PEOPLE-2013-IRSES); - POX-MEAT: Application of advanced methodologies for the analysis of protein oxidation in muscle foods (FP7-PEOPLE. FP7-PEOPLE-2009-RG); - BIOCOPAC: Development of bio-based coating from tomato processing wastes intended for metal packaging (FP7-SME SME-2011-1); MULTIHEMP: Multipurpose hemp for industrial bioproducts and bio mass (FP7-KBBE KBBE.2012.3.1-02); VALUE4WOOL: Market umbrella for the utilization of low grade grease sheep wool as organic soil amendment and fertilizer (FP7-ICT); - ECONWELFARE: Good animal welfare in a socio-economic context: Project to promote insight on the impact for the animal, the production chain and society of upgrading animal welfare standards. (FP7-KBBE. KBBE-2007-1-4-15). <p>LIFE:</p> <ul style="list-style-type: none"> - iCirBus-4Industries. "Innovative Circular Business on Energy, Water, Fertilizer & Construction Industries towards a Greener Regional Economy". LIFE14 ENV/ES/000688. - SAVECROPS¹⁸ - COMFOREST¹⁹ - WALEVA²⁰ - FERTINOWA²¹ <p>HORIZON 2020:</p> <ul style="list-style-type: none"> - TREASURE. (http://treasure.kis.si/wp/wp-content/uploads/2015/10/Solo-cerdo-lb%C3%A9rico-TREASURE.pdf)

¹⁴ Government of Extremadura (July 14th, 2016). " Fernández Vara propone convertir Extremadura en un referente mundial de economía verde ciudadana"

<http://www.gobex.es/comunicacion/noticia&idPub=19583>

¹⁵ Department of Industry, Energy and Environment of the Extremadura. "Plan Integral de Residuos de Extremadura 2009-2015 (PIREX)". http://extremambiente.gobex.es/files/biblioteca_digital/PIREX_2009_2015.pdf

<http://www.interregeurope.eu/symbi/>

¹⁷ These projects are retrieved from the RIS3 Extremadura. pp 110-111

¹⁸ <http://www.ctaex.com/savecrops-life/el-proyecto.html>

¹⁹ <http://lifecomforest.gobex.es/es/proyecto-comforest/objetivos-del-proyecto>

²⁰ <http://waleva.eu/project/>

²¹ <http://www.fertinnowa.com/?lang=es>

3. Bioeconomy Policy Support

3.1 General support framework

In support to research and innovation in the Extremadura Region, the following documents can be considered:

- In the **RIS3 Extremadura** there are identified 5 cross-cutting scientific and technological domains of which 3 are relevant for the Bioeconomy: **Agronomy, Biology and Ecology; Chemistry, Biochemistry and Biotechnology; Eco-design and New Materials**; Electronics and Automatics; Software Engineering and Computers.
- According to the **Fifth RTD Regional Plan of Extremadura 2014–2017**:
 - ✓ *Applied and oriented R&D&I*:
 1. *Agrifood. R&D&I priority lines*: Agricultural, Livestock and Forestry Production; Food Quality; Food and Health; Food safety; Agroindustrial Technologies.
 2. *Natural resources´ efficiency. R&D&I priority lines*: Economics of Natural Resources; Sustainable Exploitation of Natural Resources.
 - ✓ *Specific entities of SECTI (Sistema Extremeño de Ciencia, Tecnología e Innovación de Extremadura) that are: Secretaría General de la Ciencia y la Tecnología; Comisión de la Ciencia, la Tecnología y la Innovación de Extremadura; Consejo Asesor de la Ciencia, la Tecnología y la Innovación de Extremadura; Centro de Investigaciones Científicas y Tecnológicas de Extremadura (CICYTEX).*
- According to **Spain – Rural Development Programme (Regional) Extremadura** within the Priority 5. **P5. N13 Enabling the energy independence of agricultural holdings**, bioeconomy related area of interest can be considered **5C** “Facilitate the supply and use of renewable sources of energy, by-products, wastes, residues and other non-food raw materials to boost the development of Bioeconomy”. Rural development measures:
 - M01: Knowledge transfer actions and Information (art. 14);
 - M02: Development of agricultural and business holdings (art. 19)
 - M08: Investment in the development of forest areas and improvement of the viability of forests (art. 21 to 26)
- The **Extremadura Bioenergy Plan, 2015–2020**, brings together 5 strategic axes with 15 strategic lines, 42 strategic objectives and 95 actions. Among axes have been also defined those related to bioeconomy and precisely – “innovation and creation of knowledge around the bioeconomy”²².

²² ESEficiencia (May 28th, 2015). “Plan de Bioenergía en Extremadura”.
<https://www.eseficiencia.es/noticias/plan-de-bioenergia-en-extremadura>

3.2 Bioeconomy Policy Support

Concerning the Bioeconomy Policy Support, in strategic terms are:

- **RIS3 Extremadura.** Approved R&D&I projects. **ERDF Ininterconecta** Extremadura and Projects of the 7th Framework Program of the European Commission;
- **Fifth RTD Regional Plan of Extremadura 2014–2017;**
- **The Sixth RTD Regional Plan of Extremadura 2017 – 2020** that aims to increase the regional support and research and innovation in sectors like agro–industry, energy, tourism, health and information and communication technologies²³;
- The general policy orientation of Extremadura is towards a green economy that agglutinates the bioeconomy and will be concretely exposed in the new strategy “**Extremadura 2030**” on “**green citizen economy**”. So far, there is only a public announcement and speech by the President of the Extremadura Region, GUILLERMO FERNÁNDEZ VARA about this strategy, among others mentioning that there have been identified around 20 sectors for green work like “Eco–design, Agro–ecology, Conversion of waste into resources, Treatment and purification of waste water, Waste management and treatment; Production of renewable energies; Management of natural spaces; Management of forest areas; Prompt environmental services and entities; Environmental education; Livestock ecology; Ecotourism; Cultural pasturelands; Environmental employment in industry; and environmental R&D” and will concentrate 4 programs and about 30 projects²⁴.
- Research agenda and projects of **CICYTEX**. Some of these projects are²⁵:
 - o Agricultural Research Institute “La Orden–Valdesequera – Extensive crops : “Aprovechamiento energético de la biomasa procedente de residuos y cultivos energéticos” (LOI1301010/3). 2013–2014. Funding: LA ORDEN
 - o Institute of Cork, Wood and Charcoal– Forest Resource Technology. “Efectos de la torrefacción sobre madera para uso enológico y sobre biomasa” (IPI1301004), 2013–2014. Funding: CICYTEX
 - o Agroalimentary Technological Institute of Extremadura – Enology. “Optimización de la gestión agronómica del cultivo de variedades blancas en la región Extremeña en función de la calidad y

²³ Junta de Extremadura (July 20th, 2016). “El VI Plan regional de I+D+i tendrá como objetivo incrementar la inversión de Extremadura en investigación para converger con España”. <http://www.gobex.es/comunicacion/noticia&idPub=19616>

²⁴ Europa Press (14/07/2016) on Fernandez Vara discourse published by El Periodico Extremadura “Fernández Vara propone convertir Extremadura en un referente mundial de economía verde ciudadana”. http://www.elperiodicoextremadura.com/noticias/extremadura/fernandez-vara-propone-convertir-extremadura-referente-mundial-economia-verde-ciudadana_949834.html

²⁵ The selected projects’ data have been retrieved from the CICYTEX. “Proyectos de Investigación”. <http://cicytex.gobex.es/es/proyectos/>

productividad” (RTA2014-00049-C05-04), 2016-2018.
Funding: INIA;

- Center for Ecological and Mountain Agriculture. “Estudio de estrategias de riego en precosecha y poscosecha en el cultivo del cerezo en el Valle del Jerte” (LOI1107001), 2011. Funding: LA ORDEN

Open calls like for example European Agricultural Fund for Rural Development (EAFRD), 2.000.000 euros: “Subvención para la creación de grupos operativos supraautonómicos en relación a la Asociación Europea para la Innovación en materia de productividad y sostenibilidad agrícola (EIP-AGRI)”²⁶;

- **Extremadura University** research agenda where the biomass is among very explored research lines. The departments that contribute and develop the R&I in bioeconomy in the region are: Food Science; Biochemistry, Molecular biology and Genetics; Ecology and Earth Science, etc). The University intensively works to become a reference in terms of Efficient Management of Hydronatural Resources. In this context, detaches the HIDRANATURA project.
- **CTAEX** involvement in bioeconomy related research projects and **Plan for the promotion of R&D&I in the agro-food sector of Extremadura**²⁷ and also “Plataforma Tecnológica del Tomate para Industria”²⁸
- **INNFACTO** projects;
- **EcoEse, Cooperatives of Energy Services in Extremadura**²⁹.
- **Extremadura Avante**. Initiatives: Agrotech startup; Innovation Dynamizers Program (Programa de Dinamizadores de Innovación); Innovation Bonds and Technology Vouchers 2015 (Bonos de Innovación y Vales Tecnológicos 2015);

Finally, among networks in which Extremadura actively participates and as a result contributes to the bioeconomy development in the region are:

- ERRIN (European Regions Research and Innovation Network);
- ERIAFF (European Regions for Innovation in Agriculture, Food and Forestry);
- Eurada (EUROPEAN ASSOCIATION OF DEVELOPMENT AGENCIES).

In this context, in 2015 in Brussels, the General Director of Industry and Energy of Extremadura Government, Carolina Grau, exposed the Extremadura Bioenergy

²⁶ CICYTEX. <http://cicytex.gobex.es/es/convocatorias/99/subvencion-para-la-creacion-de-grupos-operativos-supraautonomicos-en-relacion-a-la-asociacion-europea-para-la-innovacion-en-materia-de-productividad-y-sostenibilidad-agricola-aei-agri>

²⁷ <http://www.ctaex.com/transferencia-tecnologica/plan-para-el-fomento-de-la-idi-en-el-sector-agroalimentario-de-extremadura>

²⁸ <http://www.ctaex.com/transferencia-tecnologica/observatorio-tomate>

²⁹ <http://www.ecoese.es/>

Plan 2015–2020 in a meeting on Bioeconomy organised by the Committee of the Regions, ERRIN and ERIAFF³⁰.

3.3 ESIF and H2020 resources for the Bioeconomy

According to **FEDER INTERCONNECTA Programme** with a total requested budget (780.28 million euros) and in terms of sectorial distribution of projects in Extremadura, most of beneficiaries are from the agri–food sector (45,45%) followed by the environment (13,64%)³¹.

Within the **Spain – Rural Development Programme (Regional) Extremadura, P5. N13 Enabling the energy independence of agricultural holdings**, the forecasted indicator: *T16: Total investment in renewable energy production* (area of interest: 5C) is expected to record in 2023 about 16.191.257,33 euros.

According to the **Fifth RTD Regional Plan of Extremadura 2014–2017, The Extremadura Bioenergy Plan 2015–2020** it is planned to be financed by ERDF funds (axes 1, 3 and 5) and EARDF (axes 2, 4 and 5).

Last year exposed in Brussels the **Extremadura Bioenergy Plan 2015–2020** counts with 27,5 million euros of investment and whose measures will be financed from ERDF and EARDF.

Additionally, from the interview with CTAEX, it has been understood that usually the support comes from the regional government, at the national level they are interconnected to CDTI and at international level, it is participating in LIFE Programs, Eureka and Iberoeika, among others.

4. Successful Initiatives and Good Practices

This chapter highlights successful initiatives and good practices to promote research and innovation in bioeconomy–related fields.

³⁰ Junta de Extremadura (March 21, 2015 in Brussels). “La directora general de Industria y Energía expone el Plan extremeño de la Bioenergía durante un encuentro sobre Bioeconomía en Bruselas”. http://www.gobex.es/comunicacion/noticia&idPub=15928#.WEe_YfnhCUk

³¹ Data retrieved from CDTI. “CONVOCATORIA FEDER ININTERCONNECTA 2015 ANÁLISIS DE LAS SOLICITUDES (11 de septiembre de 2015)”

4.1 LIFE Project “SaveCrops”

From the interview with key-representative from The National Technological Centre of Food and Agriculture "Extremadura" (CTAEX), as case of success have been identified the Project ***LIFE SaveCrops- – POLYVALENT BIOCIDES FROM LOCAL WASTES*** which main objective is to develop a natural pesticide from residues for the posterior application to other crops³². Besides this Project was presented as a success story at the LIFE 2016 briefing in Badajoz³³.

CTAEX as project coordinator with the local company Abonos Líquidos SL (EAL) were the beneficiaries of this financial EU instrument – LIFE + Program (LIFE + ENV/ES/000613). Total duration: 2012–2015. Total budget: 740,237.00 EUR (EU contribution: 296,599.00 EUR).

In terms of background, this project starts from the challenge and the environmental concern that the agri-food industry is nowadays facing: the significant amount of waste it generates and the growing quantity of chemical pesticides used to growth the productivity in the sector.

In term of results, in the 2016 season, there have been already recorded the application of this biocidal product on tomato industry, olive grove and vineyard.

4.2 LabPole Research Project

Another important regional public-private initiative and a successful smart specialisation case within the University Campus of Caceres is the ***LabPole (Large Animal Biopole) Project***.

The main objective of this project is the configuration of a specialised biosanitary and bioetecnological pole for the following groups: cow, horses, pig, sheep and dog, considering the animal as patient, as food and as model for preclinical investigation. LABPOLE pursue a twofold scope: local companies' competitiveness through innovative services portfolio and excellence in research and technologies to face the regional/sectoral innovation challenges through the mix among the academic, the entrepreneurial and clinical research³⁴.

Total budget: 4 million euros of ERDF (2007–2013);

Instrument: Public Procurement of Innovation through the promotion of Business Innovation Program.

³² <http://www.ctaex.com/savecrops-life/el-proyecto>

³³ CTAEX (June 30th, 2016). “Se presenta el proyecto LIFE Savecrops como caso de éxito en la jornada informativa LIFE 2016 en Badajoz”. <http://www.ctaex.com/savecrops-life/avances/184/se-presenta-el-proyecto-life-savecrops-como-caso-de-exito-en-la-jornada-informativa-life-2016-en-badajoz.html>

³⁴ As described in the interview with the key-representative from FUNDECYT – PCTEX.

In order to increase the competitiveness, the following results/innovative services have been already registered:

- Technology and knowledge transfer to industry;
- Support Unit to Export (UAEX);
- New Formats NNFF)³⁵.

4.3 HIDRANATURA Project

There is also another best practice in relation to the bioeconomy in Extremadura. The **HIDRANATURA Project** aims at the efficient management of Natural Hydrological Resources.

Within the Campus de Excelencia Internacional Program, the project is according the Extremadura Region President, José Antonio Monago, “a great impetus for the social and economic development of the region”.

The Hidronatura Project is result of collaboration between Extremadura University and CEDEX (Centro de Estudios y Experimentación de Obras Públicas). Total budget: 540.832 euros with two modalities: Consolidation and public-private.

The HIDRANATURA thematic areas of specialization³⁶ are:

- Efficient management of freshwater and dependent natural resources;
- Agronomy;
- Innovative techniques;
- Integration between agricultural production systems and natural ecosystems
- Sustainable rural and urban development;
- Tourism and hydrothermal ecosystems;

5. Needs, Gaps and Bottlenecks to Deploy the Bioeconomy

This chapter describes the main needs of the area to further deploy the bioeconomy, as perceived by the regional stakeholders and in the revised documents. In particular, the gaps and bottlenecks that hamper the development of research and innovation for specific bioeconomy-related business areas are described.

³⁵ Jesus Alonso presentation “Extremadura priorities in their RIS3 on Bioeconomy”.

³⁶ HIDRANATURA. “Áreas de especialización”.

<http://www.hidranatura.com/hidra/#!/page37.do?acond75=es&acond77=es&inu7.current.att11=1&acond99=es&link=oln18.redirect&rcond15.att3=22&kcond29.att7=27&rtu2.current.att7=27&kcond19.att7=27>

During the desk study and interviews and the challenges analysis, the following needs, gaps and bottlenecks in order to deploy the Bioeconomy have been identified:

Source of information	Identified needs, gaps and bottlenecks in order to deploy the Bioeconomy
RIS3 Extremadura	“The determination of a joint vision of the resources and capacities of the territory, and the opportunities arising from their intelligent exploitation, applying or generating different scientific-technological domains will help address the regional challenges...”
Fifth RTD Regional Plan of Extremadura 2014-2017	<p>Challenges in agri-food sector: Innovative formats; Functional foods; Sustainable agricultural production; Food security; Innovative companies; Critical mass in the scientific sector</p> <p>Challenges in basic research: Mobility of researchers.</p> <p>Management of natural resources: public sensitization on the sustainable and efficient management of natural resources; policy adaption to climate change; industrial development of Extremadura in line with efficient and sustainable use of natural resources.</p> <p>Tourism, culture and society: protection and the preservation of the Extremadura heritage and culture – new capacities, technologies and models of sustainable exploitation.</p>
Jesus Alonso’s presentation on Bioeconomy	<ol style="list-style-type: none"> 1. A need for specific bioeconomy related programs (underdeveloped regions) 2. “Including the touristic use of natural resources in the Bio-economy strategy” 3. “Extending the Bio-economy value chain through service sector (ecosystem services, tourism)”
CTAEX	<ul style="list-style-type: none"> – Increase the degree of sustainability of primary production. – Improve social and economic impact. – Improve the relationship and the transfer of knowledge to the business network. – Creation and effective use of by-products.

Additionally, according to CTAEX, the investment in R&D is a real challenge because of the size of the companies (most of companies are SMEs). Thus, *“the transfer of knowledge is very difficult, and research does not always translate into knowledge for the company, although in recent years more and more companies are coming to the technological center in search of solutions to problems”*. There is a critical need for more regional financial instrument to support the R&I in Bioeconomy.

Other need and at the same time as challenge is to continue on the economical, technology and scientific hybridization processes emphasizing the R&I between the agri-food sector with health, tourism (rural Extremadura) and energy for regional Bioeconomy. Although, one can already speak of a high hybridization with the energy sector.

6. Information Sources

Literature and Documents:

Documents:

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Project web-sites:

COMFOREST. <http://lifecomforest.gobex.es/es/proyecto-comforest/objetivos-del-proyecto>

FERTINOWA. <http://www.fertinnowa.com/?lang=es>

HIDRANATURA. <http://www.hidranatura.com/hidra/#!/page1.do?inu7.current.att11=1&acond99=es&rcond15.att3=1&kcond29.att7=1&rtu2.current.att7=1&kcond1.att7=1>

SAVECROPS. <http://www.ctaex.com/savecrops-life/el-proyecto.html>

SYMBI. <http://www.interregeurope.eu/symbi/>

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Other relevant websites:

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CTAEX. <http://www.ctaex.com/>

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TOURISM CLUSTER OF EXTREMADURA. <http://www.clusterturismoextremadura.es/>

Interviews and Contact details:

Name	Position	Institution/ Organisation	Phone	Email	Interview Date
Patricia da Costa Félix Bermejo	Project Unit Coordinator	FUNDECYT- PCTEX	+34 924 014 600 Ext. 250	patricia.bermejo@fundecyt- pctex.es	25/11/2016
Ascensión Ciruelos Calvo	Responsible for R&D&I projects	CTAEX	+34 924 44 80 77	aciruelos@ctaex.com	29/11/2016