MarginUp! | Growing value on marginal lands

SPANISH USE CASE

Hemp & Kenaf for Construction & Energy

Innovative crops. Circular solutions. Resilient regions.

OBJECTIVE

Improve land use efficiency in Mediterranean low-yielding lands by integrating hemp and kenaf into sustainable construction materials, reducing water use and enhancing circular biomass utilization.

THE VALUE CHAIN

CULTIVATION ON MARGINAL LAND
Hemp & kenaf in crop rotation (with maize) in Coria, Extremadura

→

HARVEST & PROCESSING
Fibre extraction and pre-treatment

→

BIO-BASED CONSTRUCTION MATERIALS
Natural fibre panels (replacing 30–50% polystyrene)

→

BY-PRODUCT UTILISATION
Residues for biogas and biofertilizer production

→

SUSTAINABLE BUILDINGS & ENERGY
Use in prefabricated construction and renewable energy applications

KEY FIGURES (2025)

8–10 t/ha	-20%	200 m²	≥ 70%	Lower carbon footprint
Target biomass yield	Water use per hectare	Prototype bio-based panels	Biomass residues converted to biogas or biofertilizers	(vs. conventional materials)

KEY GOALS & ACTIVITIES

1 Improve land productivity & optimize biomass cultivation

- Establish 500 m² pilot plots in Year 1, scaling up to 5,000 m² in Years 2–4.
- Implement crop rotation with maize to maintain soil fertility.
- Optimize irrigation through smart sensors.

2 Develop bio-based building materials

- Process 1 tonne/year of hemp & kenaf fibre for panel production.
- Develop 200 m² of bio-based panels (1 prototype dwelling).
- Optimize fibre treatment for higher durability and industrial processing.

3 Enhance circularity & bioeconomy applications

- Use biomass residues for biogas and biofertilizer production.
- Conduct pilot trials with anaerobic digestion at CICYTEX.
- Develop local bioeconomy partnerships.

TRL PROGRESSION

TRL 5 → TRL 7
From pilot to demonstration

LOCATION

Coria, Cáceres, Extremadura, Spain

GEOGRAPHICAL SCOPE

Regional

LEAD BENEFICIARY

CICYTEX

KEY PARTNERS

MODULAR SYSTEM, AMBIENTA, CTAEX, COPAL Cooperative

MAIN RESULTS & STATUS

- Pilot plots and first cultivation – **Completed**
- Crop rotation and irrigation setup – **In progress**
- Fibre processing optimisation – **In progress**
- Prototype panels (200 m²) – **In progress**
- Anaerobic digestion trials – **In progress**
- Scaling and replication planning – **Planned**
- Final demonstration – **Pending** (M48)

ENVIRONMENTAL IMPACT & BIODIVERSITY

Feeding habitat for birds
Alauda arvensis, Apus apus, Ciconia ciconia, Emberiza calandra, Hirundo rustica, Saxicola rubicola

Pollination service
Supports wild pollinators and greater plant diversity

Carbon sequestration
Increases soil organic carbon and root biomass, contributing to climate change mitigation

BENEFITS

Lower greenhouse gas emissions

Circular use of biomass

Rural jobs and income opportunities

Resource-efficient construction

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CICYTEX — CENTRO DE INVESTIGACIONES CIENTÍFICAS Y TECNOLÓGICAS DE EXTREMADURA

modular home

ctaex — centro tecnológico nacional agroalimentario

COPAL