



## BUSSINES MODEL 1. ALMERIA

### RUSTICA BUSSINES MODEL FOR ALMERIA REGION

#### SHORT SUMMARY FOR PRACTITIONERS

EN version

Intensive greenhouse agriculture in the Almería region produces approximately 2 million tons of organic waste annually, primarily derived from horticultural crops grown under plastic. These wastes pose management challenges due to their seasonality, the large volume generated, and the presence of non-biodegradable plastic materials such as polypropylene raffia. Although there are composting facilities that process some of this waste, the adoption of compost among farmers remains limited.

A biofertilizer blend specifically designed for the region's edaphology characteristics has been developed, consisting of 50% compost, 20% biochar, 20% insect biomass, and 10% insect frass. This formulation has the potential to improve soil fertility in organic greenhouse crops (4,245 ha), with a recommended application of 10.5 tons per hectare every three years. However, biochar production faces significant barriers in the region due to a shortage of woody biomass.

The proposed business model is based on a circular economy strategy, integrating farmer cooperatives, waste management companies, and providers of emerging technologies, such as waste bioconversion through insects. This strategy aims not only to reduce reliance on mineral fertilizers but also to efficiently manage the organic waste generated.

#### SHORT SUMMARY FOR PRACTITIONERS

NATIVE version

La agricultura intensiva en invernaderos en la región de Almería produce aproximadamente 2 millones de toneladas de residuos orgánicos anualmente, principalmente derivados de cultivos hortícolas bajo plástico. Estos residuos presentan desafíos en su gestión debido a su estacionalidad, el gran volumen generado y la presencia de materiales plásticos no biodegradables como la rafia de polipropileno. Aunque existen plantas de compostaje que procesan algunos de estos residuos, la adopción de compost entre los agricultores sigue siendo limitada.

Se ha desarrollado una mezcla de biofertilizantes específicamente diseñada para las características edafológicas de la región, compuesta por 50% compost, 20% carbón vegetal (biochar), 20% biomasa de insectos y 10% excrementos de insectos. Esta formulación tiene el potencial de mejorar la fertilidad del suelo en cultivos orgánicos de invernadero (4.245 ha), con una aplicación recomendada de 10,5 toneladas por hectárea cada tres años. Sin embargo, la producción de carbón vegetal enfrenta barreras significativas en la región debido a la escasez de biomasa leñosa.

El modelo de negocio propuesto se basa en una estrategia de economía circular, integrando cooperativas de agricultores, empresas de gestión de residuos y proveedores de tecnologías emergentes, como la bioconversión de residuos a través de insectos. Esta estrategia busca no solo reducir la dependencia de fertilizantes minerales, sino también gestionar eficientemente los residuos orgánicos generados.

**BUSSINES MODEL 1. ALMERIA**

## RUSTICA BUSINESS MODEL FOR ALMERIA REGION

**CONTEXT**

The Almería region, located in southeastern Spain, is renowned for its intensive agricultural activity, particularly in the production of greenhouse horticultural crops, which span approximately 32,000 hectares. This agricultural model generates around 2 million tons of organic waste annually, presenting a significant challenge for waste management and valorization. Farmer cooperatives play a crucial role in marketing agricultural products and adopting sustainable practices.

**PROBLEM**

The management of organic waste is hindered by the seasonality of waste generation, which is concentrated mainly between May and June and in February, at the end of harvest cycles. The logistical limitations of treatment plants, lack of space, and the presence of plastic waste (especially polypropylene raffia) constitute critical barriers to effective valorization. These challenges have been validated through stakeholder workshops, highlighting the urgency of addressing these issues.

**SOLUTION**

A business model based on circular economy principles is proposed, integrating biofertilizer production from organic waste generated in agricultural activities. This approach promotes collaboration between farmer cooperatives and waste management companies, facilitating the conversion of waste into high-quality biofertilizers. The optimal blend designed to improve soil health consists of compost (50%), biochar (20%), insect biomass (20%), and insect frass (10%).

**OUTCOME**

The implementation of this business model could allow for the valorization of up to 13% of the waste generated in the region, sustainably introducing biofertilizers into the agricultural market. This approach not only reduces dependence on mineral fertilizers but also promotes regenerative agricultural practices that enhance soil health and long-term sustainability. By effectively utilizing the significant volumes of organic waste produced in the intensive horticulture of Almería, this model addresses waste management while fostering a more sustainable agricultural ecosystem. Additionally, it aligns with the interests of local cooperatives and waste management companies, creating a collaborative framework that improves resource efficiency and ultimately contributes to a more resilient agricultural system in the Almería region.

**PRACTICAL RECOMMENDATIONS**

It is recommended to implement training programs aimed at farmers regarding the use and benefits of biofertilizers and compost. Additionally, it is crucial to promote synergies between farmer cooperatives and waste management companies to facilitate the valorization of organic waste. Lastly, establishing economic incentives to encourage the adoption of innovative technologies in biofertilizer production and waste management is suggested.

Demonstration of circular  
bio-based fertilisers and  
implementation of optimized  
fertiliser strategies and value  
chains in rural communities

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