

SOCIAL LCA

Evaluating Social and Socio-Economic Impacts of Bio-Based Fertiliser Solutions in Five Regional Value Chains

SHORT SUMMARY FOR PRACTITIONERS

EN version

The Social Life Cycle Assessment (S-LCA) analysis was conducted of the full RUSTICA concept, including the integrated fruit and vegetable nutrient recovery value chains developed in the context of 5 RUSTICA regions: Flanders, Pays de la Loire, Almeria, Friuli-Venezia Giulia and Valle del Cauca (Colombia). RUSTICA concept incorporates various technologies for the production of several fertiliser ingredients (microbial biomass, insect biomass, insect frass, nutrient concentrate, biochar, compost), each of which having own specific characteristics and composition that is linked to the regional inputs from which they are produced. These different ingredients are applied as specific RUSTICA Bio-Based Fertiliser (RBBF) blends formulated to match the current and future crop needs on a regional (or inter-regional) level, as defined by the regional multi-actor networks in 5 RUSTICA regions.

The aim of S-LCA was to determine the social and socio-economic aspects of RBBFs and technologies and their potential positive and negative impacts in the 5 RUSTICA test regions. Considering that RUSTICA technologies are still at an early development stage, a prospective S-LCA was performed from the sectoral perspective (the agricultural sector). The intended application of S-LCA in RUSTICA project was to identify social “hotspots” in the current agricultural practices in RUSTICA regions, as well as examine how the introduction of RUSTICA concept could influence (positively or negatively) these hotspots. Data for the S-LCA analysis was either derived from the project itself (e.g. market analysis), available public reports and databases, and through diverse interactions with RUSTICA partners and stakeholders.

SHORT SUMMARY FOR PRACTITIONERS

NATIVE version

The Social Life Cycle Assessment (S-LCA) analysis was conducted of the full RUSTICA concept, including the integrated fruit and vegetable nutrient recovery value chains developed in the context of 5 RUSTICA regions: Flanders, Pays de la Loire, Almeria, Friuli-Venezia Giulia and Valle del Cauca (Colombia). RUSTICA concept incorporates various technologies for the production of several fertiliser ingredients (microbial biomass, insect biomass, insect frass, nutrient concentrate, biochar, compost), each of which having own specific characteristics and composition that is linked to the regional inputs from which they are produced. These different ingredients are applied as specific RUSTICA Bio-Based Fertiliser (RBBF) blends formulated to match the current and future crop needs on a regional (or inter-regional) level, as defined by the regional multi-actor networks in 5 RUSTICA regions.

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

RUSTICA



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CONTEXT

The RBBFs are intended to provide agriculture with the same functional benefits as mineral fertilisers (well-defined composition and release rates) but sourced from locally available fruit and vegetable waste streams closing the nutrient cycles on a regional level. The potential replacement of mineral fertilisers with RBBFs will lead to the economic and environmental implications, but it could also affect various stakeholders and their well-being at the regional level, which was evaluated through S-LCA.

PROBLEM

To screen social and socio-economic aspects in agricultural systems in Belgium, Spain, Italy, France and Colombia and the presence of risky practices or outcomes that might negatively impact groups of stakeholders, and to evaluate the potential social and socio-economic impact (positive and negative) of the RUSTICA concept on these agricultural systems.

APPROACH

S-LCA was performed in a comparative way, which means that a business-as-usual scenario (the current agricultural practices in the regions) was compared with the RBBF business model scenarios in Belgium, Spain, Italy France and Colombia to assess the potential social and socio-economic changes (positive and negative) brought to the regions by the introduction of RBBFs.

OUTCOME

1. The initial screening analysis with regional stakeholders pre-selected stakeholder groups and social topics that were considered material for the regions.
2. The social implications (positive and negative) of introducing RBBFs for the pre-selected social topics varied across RUSTICA regions.
3. In all regions, the positive impact of RBBFs was identified for the following social topics: fair salary, health and safety living conditions, promoting social responsibility, employment (quantity and quality) product agronomic performance and technology development.
4. In all regions, the negative impact of RBBFs was identified for the following social topics: product application (affordability and complexity of application) by farmers.
5. The impact of RBBFs on other social topics was either neutral or varied from one region to another.

PRACTICAL RECOMMENDATIONS

- ✓ The introduction of RBBFs in the 5 RUSTICA test regions is largely positive or neutral for the well-being or regional stakeholders.
- ✓ The negative social impacts of RBBFs are mostly related with the high price of crop fertilisation by farmers compared to the current practices in the regions
- ✓ The high price of RBBFs is due to relatively low Technology Readiness Level (TRL) of RUSTICA technologies, but there is still a major potential for further improvement, optimisation and cost reduction.
- ✓ Tailored business development approaches are needed per region (based on regional waste streams, crop and soil needs and regional technological expertise and partnerships) to optimise the costs and maximise the potential social effects from the introduction of RBBFs.