

More sustainable, resilient, and competitive food systems through the development of intermediate food value chains



PRACTICE ABSTRACT No: 31

Why and how to estimate the potential environmental benefits of an innovation at an early stage?

Any innovation aiming to bring environmental benefits to value chains (VCs) can only be reasonably considered after a comparison with existing value chains. It is essential to prioritize the value chains to be targeted and, if necessary, refine the innovation itself to improve its impact on the targeted VCs.

To implement such an approach, several steps must be considered:

- 1. Choose an innovation that is likely to reduce environmental impacts.** In the FAIRCHAIN project, the implementation of a small packaging machine (technical innovation) could help reduce environmental impacts by (1) consuming less energy and water than existing processes and (2) using alternative packaging (e.g., bio-based materials).
- 2. Define the targeted VCs and the key partners.** In FAIRCHAIN, the technical innovation mentioned was implemented in two value chains: one involving a small farm producing apples, apple juice, and applesauce (small-scale), and another involving an international food company processing mainly vegetables combined in recipes with animal-based ingredients, such as in sauces (large-scale).
- 3. Model the systems** associated with the targeted VC using the methodological framework of Life Cycle Assessment (LCA), applying a cradle-to-grave approach, i.e., from raw materials to the use of the product by the consumer, including packaging.
- 4. Collect data to assess the environmental impacts of the VCs.**
- 5. Assess the environmental impacts** using appropriate methods defined by the LCA methodological framework.
- 6. Analyze the results and quantify the potential** of the innovation to reduce environmental impacts.
- 7. Propose ways to amplify the potentials.**

This methodology was applied to the two value chains mentioned, showing contrasting results. For the small-scale scenario, processing contributes significantly to environmental impacts, namely due to the use of glass packaging in the existing value chain, indicating a strong potential for improvement through innovation. In the large-scale scenario, most of the environmental impacts come from the use of raw materials, especially animal-based ingredients. In this case, the potential of the innovation has yet to be confirmed. **These examples from the FAIRCHAIN project illustrate the importance of addressing environmental assumptions at the early stages of the innovation process and show how the estimation of environmental benefits can be evaluated in practice.**

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End Users

Industry & Retail
Small producers

Country

Belgium



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Links for additional information

[HTTPS://WWW.FAIRCHAIN-H2020.EU/CASE-STUDIES/BELGIUM/](https://www.fairchain-h2020.eu/case-studies/belgium/)



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ABOUT FAIRCHAIN

The FAIRCHAIN project launched in 2020 and coordinated by INRAE, is developing intermediate food value chains in the fruits and vegetable and dairy sectors. Through technological, organizational and social innovations and by developing business models FAIRCHAIN will enable small and mid-size stakeholders to scale up to supply fresh, sustainable and high-quality food products to consumers at a regional level.

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