

## **Methodological challenges for combining qualitative future scenarios and LCA in the food and agricultural sector**

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### **Keywords**

qualitative scenarios, quantification, life cycle assessment, alternative futures, foresight

### **Problem and aim**

The scenario method is an established instrument in foresight and strategy development that supports the user with handling uncertainties. Scenarios explore the future and identify different future perspectives, thus provide a background for decision-making. Moreover, by unfolding scenarios, decision makers win awareness of the variety of future possibilities, uncertainties in surrounding environment and indicators of discontinuities. Since they are based on assumptions about future developments scenarios mostly include a wide range of qualitative descriptions and are presented as story lines about alternative futures. A life cycle assessment, however, is based on quantitative data as well as values and numbers related to the present, e.g. alternative options of products (studied unit versus reference unit). In this study a concept to combine future scenarios with a life cycle assessment will be developed. Scenarios of the future European food sector serve as a basis to test the conceptual framework of quantifying the qualitative descriptions and their subsequent combination with LCA.

### **Methods**

Scenario method and LCA are in focus of the analysis. Qualitative information from scenarios will be transferred into quantitative data in the course of this study. That means that qualitatively described scenarios or aspects of these scenarios will be converted into variables in order to be incorporated into a LCA model.

### **Results**

In the European research project Food processing in a box (FOX) that is a part of the Horizon 2020 Research and Innovation programme scenarios for the European food sector are developed. They serve as future framework conditions for innovative technologies, that are developed by other partners in this project. The focus here lies on mildly processed fruits and vegetables through innovative, small-scale technologies in flexible and mobile processing units to be used in regional food systems. This study will develop a concept of how to integrate the findings from the scenarios for the European food sector into LCA in order to future-proof the analysis of the lifecycle of products. This enables the technology developers to design their processes in a more robust, sustainable and market oriented way.

### **Discussion/Interpretation**

The world is facing major global challenges with a high impact on food systems and food security. Climate change and digitalisation are examples for mega trends that have great impact on various stages of the food value chain. Consumer behaviour as well as the attitude towards sustainability in society are driving factors for the demand for diversified food. These aspects are discussed in scenarios within the project FOX. In this project scenario development as well as LCA is conducted for specific products and technologies. The consideration of qualitative aspects and alternative future developments in the LCA would set this quantitative method in a bigger context.

## Literature

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