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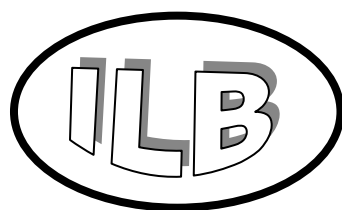
# **System Dynamics and Innovation in Food Networks 2014**

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## Knowledge Transfer Tools for Enhancing Sustainability

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### Extended abstract

The majority of SMEs needs repeated explanations and evidences to be convinced about the feasibility of adopting measures for improving sustainability. This is a particularly challenging task since meeting the requirements of business growth, reduction of environmental impact, social responsibility and good governance at the same time requires complex thinking and ability to find trade-offs. Human and financial resources of SMEs are usually limited. It is difficult to motivate them to change their practices until they can't see that these changes improve or at least maintain the viability of their business and will bring them clear benefits and relatively quick return of their invested efforts and resources. Although everybody agrees that the reduction of the environmental impact and increasing the social responsibility of food and agriculture businesses is unavoidable and beneficial for the society in general, SMEs are not convinced that their additional costs and efforts will be acknowledged by the customers and consumers. If during the explanation of the sustainability requirements the main emphasis is put on the environmental aspects this message may not be satisfactory effective to persuade food SMEs to take actions, particularly in the less affluent countries. Similar typical causes of the reluctance to act on improving compliance to environmental and social requirements were found in the Latin- American countries and in Hungary, which include the following arguments and concerns:

- The smaller is a business, the smaller is its contribution to the total environmental impact.
- Many other businesses including larger ones than us can continue to make business without making major changes in their activities. Why should we make the first step? Is it a real consumer requirement?
- Who will cover the additional costs of the changes, sustainability measures?
- Our limited resources have to be focused on production. We do not have time to spend on measurements and calculations. Why shall we share our data with our competitors, why shall we give them information, what they can use for competing with us?

Although customer requirements can be used to impose pressure on suppliers to achieve some changes their impact will be limited until the suppliers can find alternative markets for their products produced with the current practices. Better improvement can be achieved by convincing SMEs that the changes towards improved environmental and social performance will result in improved competitiveness and profitability. For persuading SMEs their main problems in operating their business should be understood – e.g. the permanent struggle to cope with the pressure of the customers to reduce prices and in parallel to comply with the more and more demanding legal and customer food safety, environmental and social requirements while price of energy, water, material and cost of labour is permanently increasing. Such value propositions should be offered for them which provide a solution for harmonised improvement of several aspects of some of these expectations. Both in LA and in South-East Europe farmers and SMEs have to be convinced about the benefits and trained on the appropriate methods of collaborating with peers, to share resources and costs without disclosing confidential information

Experiences collected during work with food SMEs showed that resource efficiency and improving competitiveness are very attractive subjects for nearly all of them. Improving the efficiency of using resources such as energy, water, material, and packaging material not only results in reduction of costs but also leads to reduction of environmental impact. More efficient use of labour force will also reduce costs and potential solutions for using the staff saved to increase the added value of the products and services can be explored instead of making them redundant. Thus the subject of resource efficiency provides an approach through which the interest of food SMEs can be raised and direct benefits reflected by better competitiveness can be offered in parallel with the reduction of environmental impact. In addition to that several benefits of collaboration along the food chain can also be explained to SMEs.

There are several experiences from different areas of food science, technology and management, which indicate that better understanding, acceptance and adoption of new concepts can be achieved if several knowledge transfer tools are combined for explanation of the benefits and demonstration of the practices for SMEs. The opportunities for personal discussions with experienced tutors and experts, learning from peers, using decision supporting calculation tools are particularly important in the learning process of SMEs. Therefore several knowledge transfer tools were applied in the SALSA FP 7 project such as awareness raising workshops, trainings with group exercises, webinars, explanation of successful cases, personal visits, guidelines for successful practices, short practical summaries, posters, web-based self-assessment tools for measuring sustainability performance of soy and beef supply chains, making all this information available at a (project) website. Trainings were provided to intermediaries and food businesses involved into the beef and soy supply chains exporting their products to Europe in Argentina, Brazil and Mexico. The trainings covered the legal requirements and private trade standards which have to be met for exporting to Europe, the food chain management principles, the chain management approach of innovation, the application of modelling tools developed in the project. Within the food chain management course the benefits and methods of collaboration of chain members were emphasized as the access to complementary resources, capabilities and competences of the chain partners which can be used for developing new joint core competences, more efficient use of resources and better information on market situation, trends, customer requirements, prices, etc. Advantages of networking of SMEs with peers were also explained with practical examples. The techniques for identifying common chain goals, defining chain performance indicators, selection of the most feasible strategy alternatives were explained. For the intermediaries additional trainings were provided on successful practices of knowledge transfer and on organising training courses.

Since SMEs prefer practical examples demonstrating the benefits for their business to understand and accept new approaches in addition to the training modules presentations were made on good practices, practical experiences, and successful cases and on such results of research projects which are related to sustainability. A presentation on European business and innovation approaches based on the food chain management principles covered examples on food transparency practices (from Transparent-Food FP7 project) related to certification, applications informing consumers and customers on environmental performance, provision of indicators, benchmarking tools, self-assessment and decision supporting tools for comparing the benefits and drawbacks of alternative products, technologies, systems for businesses. Further examples were shown on ensuring the authenticity of quality Simmental beef through labelling and vacuum packing, on application of the enablers of the Future Internet (from SmartAgriFood FP7 project) for tracing and tracking of meat and for smart shopping information system for consumers, a valorisation approach of citrus by-products (NAMASTE FP7 project) and on application of calculating carbon footprint. An other presentation was made on approaches, methods, technical developments to improve sustainability performance through improving the efficiency of using resources such as material, energy, water, labour time, maintenance, reducing waste, utilising by products, exploiting benefits of business collaboration along the chain. Practical examples and project results covered application of the lean techniques in the food sector for identification and elimination of sources of losses (from the IMSFood CORNET project) such as analysis of the distribution of weight of semi-finished and finished products to reduce selling of food product with weight over the specified weight, using thermo-vision technique for identification of insulation problems in heating and freezing equipment, energy saving of fluidised-bed freezers through optimised mass flow, saving water through dry cleaning. Envisaged technical solutions for the Food Factory of the Future (from the FoodManufuture FP7 project) were explained, which included the use of integrated sensor networks for real time process control of production machinery leading to reduction of use of energy, water and improving yield, business modes for reduction of investment and maintenance costs of machinery enabling easier access for SMEs, optimising food package volume and light weight packages, virtual design for simulation of processes, which can be used for optimising operations for resource efficiency, packaging solutions to extend shelf-life, thus reducing the food waste. Energy saving

solutions based on the application of variable speed drive in compressors were also explained (from the Cool-Save FP 7 project) since reduction of food waste provides an obvious way to reduce environmental impact. The approach for optimising the food and related resources through better design of the operation of the food chain was also presented. All these technical and management system solutions were used to demonstrate that SMEs have several alternatives for improving the sustainability, particularly reducing the environmental impact without compromising competitiveness.

Web-based self-assessment tools were developed by different teams within the project. An LCA based analytical tool is provided for defining and monitoring key sustainability performance indicators of soy and beef chains, benchmarking the actual performance against a set of supply chain KPIs, and defining improvement needs and opportunities. This tool is linked to an integrated operational tool for assessing the sustainability impact of the improvement options which can be used for defining redesign strategies. Guidelines were developed to help the use of these modelling tools. The tools and the guidelines are available through a web-based platform, the SALSA E-platform. Based on the experiences of other food modelling tools like predictive microbiological models typical applications by businesses including SMEs include comparing alternatives in practices and parameters, evaluation of the impact of changes and improvement scenarios, benchmarking of sustainability performance, optimising processes and their control, identifying, highlighting hot points, customising approaches and designing sustainability strategies.

The applicability of the knowledge and the approach developed in the SALSA project was tested also in a European business environment, in Hungary where the sustainability concept is not well understood and adopted yet by the farmers. The knowledge and methods were used to help the testing of the new voluntary ENVIFOOD protocol, which is aimed at harmonising the environmental footprint methodologies. The tests on the Hungarian Charolais beef chain showed that the current practice of finishing the breeding of calves before fattening and selling the young animals to abroad for fattening results in a fairly high impact/kg meat on the CO<sub>2</sub> emission, e.g. that those steps of the beef breeding are carried out in the county which cause the majority of the negative impact on the climate change. This indicates the need for thinking over the current practices considering the environmental impact.

The experience shows that interest of SMEs to sustainability can be raised by focusing first on such methods which create a core value for them such as the resource efficiency which reduce costs and increase the profitability and competitiveness of the business and in parallel result in improvement of the environmental performance for meeting other sustainability criteria. Therefore these topics can provide a starting step for implementing sustainability measures. Encouraging innovation and investment in resource efficient technologies through knowledge transfer and training can support the adoption of sustainable food production methods. It was found that the combined use of different knowledge transfer tools and methods is more effective in improving the acceptance and adoption of the sustainability concept, than the use of single tools.

**Keywords:** *resource efficiency, value proposition, cost reduction, sustainability, knowledge transfer*

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