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Klaus Wagner

Federal Institute of Agricultural Economics, Marxergasse 2, A-1030 Vienna, Austria
klaus.wagner@awi.bmlfuw.gv.at

Knowledge transfer and innovation network on the example of the EU-project TECH.FOOD

Abstract: *The project "Tech.Food - Solutions and interventions for the technological transfer and the innovation of the agro-food sector in South East regions" was running in the framework of the EU-South East Europe Transnational Cooperation Programme, financed by the European Regional Development Fund (ERDF). It aimed at setting up a transnational network for building links among enterprises and research bodies of a wide area. It represented an opportunity to improve the partner's institutional capacity to be effective in promoting innovation. The direct involvement of enterprises represented transnationality, concurring to create innovation and internationalization opportunities to local productive systems. Partners of eight countries under coordination of an Italian lead partner implemented the project ideas of elaborating regional profiles of needs and weaknesses concerning research, development and innovation of the agro-food sector. Transnational networks, technological transfer nodes, technical focus groups as well as best-experience data base and tool development for raising the innovation potential should contribute to the project aims.*

Keywords: *knowledge transfer, innovation, food technology*

Introduction

The agro-food industry is one of the main sectors of the South East Europe (SEE) economy in terms of turnover, number of SMEs and employees. The ERDF South East Europe project "Tech.Food - Solutions and interventions for the technological transfer and the innovation of the agro-food sector in South East regions" arose from the needs of the sector, aimed to define common strategies, tools and opportunities to support research, technological development and innovation of food enterprises, It was coordinated from the Province of Modena, Italy. 13 partners from Italy, Austria, Greece, Romania, Hungary, Croatia and Serbia with an economic, agricultural, food technology and innovation consulting background created networks of information exchange on national and international level, among enterprises, experts, researchers and administration. The project ran from 2009 to 2012; detailed information is available on www.techfoodproject.eu.

The main objective was to support and improve the competitiveness of agro-food enterprises of the partner countries, in line with the strategic objectives of the Lisbon process. The concrete aim was to improve products quality and to implement processes and services more efficient and sustainable. The project realisation should contribute to renew consumers' confidence by allowing a more mature perception of products quality and an increased awareness of a high technological food production and should provide sector operators with new methodological and technical-scientific tools to improve competitiveness and security of food production and should ensure better monitoring of the technological research and support to innovation activities.

Methods

In order to develop an exchange of knowledge among the partnership a fundamental analysis of the innovation needs and potentials of each of the involved regions has been elaborated. It was implemented through a study of the agro-food sector for each participating region (**regional profiles and case studies**) and was carried out by a mutual interaction among the stakeholders. It described the agro-food vocations, the technological characterization of food productive systems, and paid particular attention to traditional food chains. The studies lead to address further project activities and strategic choices of public and private actors promoting innovation in the food sector.

The creation of a "**Transnational Horizontal Network**" (THN) provided a support system on technical, scientific, institutional and economic aspects linked to innovation in the South East Europe agro-food sector. THN included seven Technical Working Groups on different fields of agro-food innovation.

Poly-functional **Technological Transfer Nodes** (TTNs) in each region strengthened existing facilities and services to innovation (research bodies,

SMEs desks, etc.), and supported local initiatives, involving enterprises with seminars and focus group discussions.

An **Innovation Toolbox** aimed at identifying tools able to foster innovation. Analytical tools were developed and implemented via training seminars to improve awareness on innovation needs, while intervention tools were addressed in order to promote the application of best methodologies for innovation and knowledge management.

Functional links among enterprises and research bodies in different regions in order to generate common projects and to develop common business connections have been realised with thematic **Focus Groups**. An **Example of Excellence Database** shows recent developments of innovative projects in partner regions and **Innovation Roadmaps** contain specific indications for the implementation of innovation processes in the food sector.

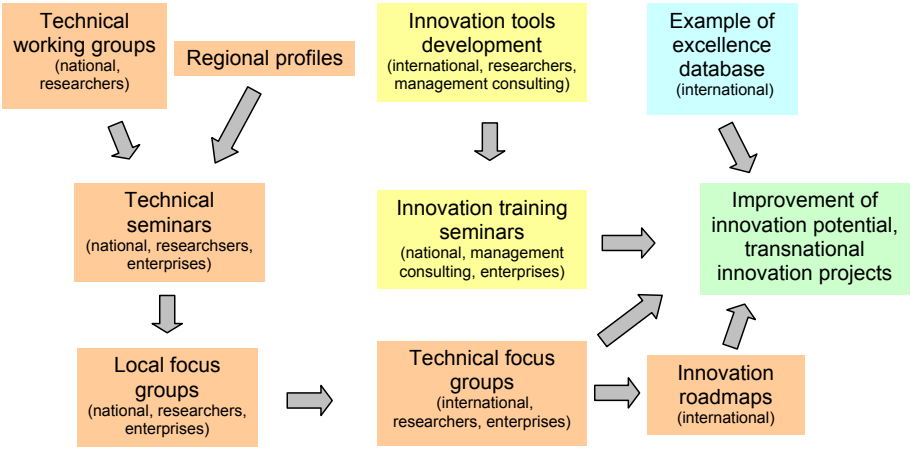

Figure 1. TECH.FOOD project approach, implementing a knowledge flow
Source: TECH.FOOD (2012), adapted.

Regional Profiles, needs and potentials

Regional profiles were elaborated for Italy (Emilia Romagna), Croatia (Istria), Serbia, Greece (Attica), Romania (South Muntenia), Hungary (Central Hungary), and Austria (Upper Austria). They contained an analysis of the agro-food sector including education and research structures, policies and programmes, innovation support structures, a SWOT analysis, innovation needs and perspectives, trends and case studies. The results showed the discrepancies between the level of research results produced and the innovation index, especially between old and new EU Member States. The cause of such differences lies in the inputs which make a country more innovative, though sometimes the increase of mere inputs does not mean that a country will become more in-

novative. For example, Hungary, Istria County in Croatia and Serbia show an insufficient development of research and innovation activities, as confirmed also by the enterprises needs expressed through the questionnaires.

The profiles stated that the industrial Research & Development sector is weak and that companies have low technology capabilities. Developed countries employ the vast majority of their researchers while this is not true for other countries and at the same time only a low percentage of researchers work in the business sector, compared to the EU average. In addition, it is possible to introduce some considerations valid also for all the other TECH.FOOD partners, for example the fact that research and innovation activities for many companies are justified as a way to increase or retain market share and the product range expansion.

The most important goals of innovation activities are:

- lowering the production costs;
- new technology/equipment implementation;
- labour costs cuts;
- product quality, working conditions improvements and a better work organization.

The limiting factors of innovative activities are primarily:

- low innovative potential of the enterprise;
- insufficient qualifications (i.e. lack of employees' training);
- insufficient companies buyer attitude for accepting new products;
- uncertainty of the timetable for the realisation of innovation.

It is to consider that an enterprise board's vision is necessary to stimulate the enterprises propensity towards innovation activity, as well as the growth of the research and development competences, but also to improve structures for internal research.

In some countries, there are great efforts directed toward creation of business networks, such as clusters, which should contribute to increase of competitiveness especially of small and middle companies. These types of networking companies' organisations are of a great importance because all operators along food supply chains, regardless if they have regional, national or global scope, can benefit from common actions, such for example a common approach towards food safety and quality. Improved networking is essential for positioning a supply chain's product in highly competitive markets and ensuring consumer protection in already globalised food markets.

One of the main goals of the food sector should be the creation of a productive structure system, such as industrial districts, that involve many of specialised

and independent small and medium-sized businesses, concentrated in specific areas and operating in the same sector, either collaborating or competing. The districts are characterised by a strong vertical integration along the value chain and they grew in the past around some localized industrial segments. Such industrial districts have contributed to the socio-economic development of many regions in terms of widespread wealth and employment and the ability to compete at the international level, generating a considerable international openness of the economy. These regions now boast strong industrial specialisation throughout the production chain, in many cases located in specific areas where companies found their excellence on a system of knowledge based on local expertise. The main features of the district system are its flexibility and adaptability of the changes of the market.

Nodes and networks

In order to promote networking, innovation and technology transfer in every partner country a so called "regional technological transfer manager" was nominated as local node who cared for the establishment and coordination of Technical Working Groups (TWG), related in particular 7 issues to innovation in the agro-food sector:

- Tracking, tracing and monitoring of the goods handling;
- Traditional and organic productions;
- Packaging technologies;
- Functional foods;
- Goods logistics;
- ICT and innovative marketing solutions;
- By products managements and energy production.

In the end a network of 34 researchers in 7 different countries was involved, with the aim of fostering applied research to business needs. The researchers presented and discussed in technical seminars and elaborated working papers for example: "New technologies for decontamination of food", "Systems of traceability", "The Common Agricultural Policy in the function of organic production", "Increasing marketing possibilities of traditional and regional meat products", "Herbs as modern food", "Packaging for the generation 60+", "Nano-biotechnology as a tool for functional food formulations", "Energy self-sufficient food processing factories" and others.

These various research aspects were the background for discussions with more enterprises oriented presentations and discussions in national "local focus groups" and on international level in "technical focus groups", organised by "transnational technological transfer managers". Enterprises were invited and had the chance for information and national and international networking too. In this way a lot of information material and possibilities were created

with the aim to mitigate the lack of a common language that usually exists between institutions, research organizations and enterprises.

Innovation tools and its implementation

Another aspect of the innovation process was the creation and application of various analytical and interventional innovation tools to improve innovation performances of food enterprises, institutions and research bodies. The tools are available for free from the web page www.techfoodproject.eu. Analytical tools consist in new generation methodological instruments aiming at improving awareness on innovation needs, also in order to optimize the further methodologies of intervention. For this purpose, enterprises may detect their innovation needs and potentials, while institutions and research bodies could enable these subjects to evaluate the effectiveness of past regional innovation policies. Intervention tools are mostly addressed to the application of best methodologies for innovation and knowledge management and have the goal to improve the public and private actors in the agro-food sector.

"Innovada" is a start-up program that provides a path in 4 stages (full immersion training day) to meet the needs of start-up with national and international consulting, high profile workshops and thematic business meetings.

"Modena Innova" is a local initiative that provides free advice of experts aimed at companies in the manufacturing, production services, energy, construction, commerce, tourism, food and public services.

A "Catalogue of Research" was developed to facilitate small and medium enterprises to have adequate support in the search for products and services in six thematic platforms.

"Knowledge Economy" shows the economic knowledge as a key element for the competitiveness of enterprises and the actual transformation of public administration.

The "relational Swot analysis – questionnaire" provides exhaustive information on how to use SWOT analysis through a clear description of objectives and a standard questionnaire to support stakeholders.

"Innovation Budgeting" aims at identifying specific budget maximizing strategies.

"Innovation Process Management" provides suggestions and explanations on how to innovate, given some of the cornerstones of quality as described already in the Deming Cycle (Arveson, 1998).

The "Strategic Planning" describes the first scanning of the internal and external environment with SWOT analysis as an analytical tool, then an internal and external analysis, the way to define strategies and innovation budgeting as an intervention tool.

The "Fit For Innovation - Self Assessment Test" is an analytical and intervention tool developed by CATT & Johannes Kepler University that has the focus on 5 topics for self assessment of enterprises.

A "Quick Competence Test" enables SME and R&D-organizations to evaluate their innovation ideas under the "big picture view". Every participating organization will get an individual competence-check about strength, weaknesses and interfaces for topics like targets, conditions, processes and outputs of their enterprise.

Training activities with these tools have been conducted in all partner regions in the course of the TECH.FOOD project.

Examples of excellence

The database of excellence examples provides activities and projects showing innovative solutions in organisation, management, co-operation, production, product development and marketing with the aim to disseminate technological knowledge and to facilitate competences flows and business relations. The free access database on the TECH.FOOD web page contains more than 120 most interesting and innovative recent examples of TECH.FOOD partner countries with type, sector, innovation topic characteristics, a short description and contact details. For example an Austrian Mountainherb-association is described as well as the food cluster Upper Austria which is a platform of research, science and enterprises to exchange their knowledge and needs. Other examples are the Italian research centre on animal production, the Italian marketing organisation Research to Business, the consortium Parmiagiano-Reggiano, the Serbian traditional meat production Zlatiborac and the Istrian Agro Cooperative Centre which concentrates on marketing and logistics for organic vegetables and fruits of Istria. The Hungarian Kalle enterprise concentrates on research of packaging materials and systems. The Greek lipid forum conducts research on lipids and oils and brings together all Greek scientists and enterprises on this topic. Some Romanian activities concentrate on research and marketing concerning pig and pork production as fully integrated processes.

Raising of the innovation potential and project experience

The TECH.FOOD project had the main objective to create a network of scientists, researchers, institutions and enterprises. The flow of data is now available for all the enterprises. Obviously it is of great interest for the small and medium ones that usually are not able to support large projects of research.

The project has been in fact developed with a large contribution of SMEs involved in the field of research and agro-food production.

More than 100 events and initiatives – at local and international level - have been organized; expert working groups produced and disseminated a flow of information on traditional food productions, regional and typical behaviour of food industries but also on the state of application of the food laws and principles and requirements in different EU-regions.

The network of competences is now accessible to all stakeholders involved in the food production and consumption facilitating the exploitation of results in the field of food safety and quality. It can be an overall basis of an international platform on food research developing the different themes.

The innovation process must be intended like a mutual interaction between stakeholders (enterprises, institutions, research), the so called triple helix system (Etzkowitz, Ranga, 2011). To be effective it is fundamental to tackle the disabling weakness of the process: creativity in developing innovation and capability to share the knowledge.

The experience of the TECH.FOOD process showed that large enterprises often use own innovation structures and networks for national and international interactions. SMEs often struggle with a lack of time and human resources to concentrate on innovation processes. In small enterprises the everyday work-life ties up most of the resources. They need well adapted support which provides them with long term perspectives. But very essential is a short term success to give the financial base for economic survival and to motivate them for investing in innovation.

Literature

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