

CHAPTER 10

FOOD INNOVATION AT INTERFACES

Experience from the Öresund Region

MAGNUS LAGNEVIK

School of Economics & Management, Lund University, Sweden

INTRODUCTION

This paper presents the innovation system ‘Food Innovation at Interfaces’. The system has its centre of gravity in Scania, a province in the south of Sweden. The combination of multinational companies, small innovative companies, cutting-edge academic centres, professional research institutions, competitive support organizations and co-operative authorities forms the key resource for the Öresund food cluster. In order to provide an understanding of the embeddedness of the innovation system, the paper starts with a short introduction of the Öresund area.

BACKGROUND AND EMBEDDEDNESS

The Öresund Region – Denmark and Scania in southern Sweden – is today one of the fastest-developing food clusters in Europe. The cluster area is officially appointed as a highly prioritized area by both the Swedish and Danish Governments. The area is supported by the governments of the two countries regarding research, education and infrastructure. This, together with the combination of large international companies, small innovative companies, strong academic centres, professional research institutions and competitive support organizations, creates a combination of resources that can make the Öresund cluster a centre of excellence in food. Denmark has always been a large food producer with high export volumes. A recent benchmarking study shows that, in relative terms, Denmark exports about three times more agricultural and food products than any other country in the world. The very south of Sweden – Scania – is the centre for Sweden’s food industry with about 45 percent of the food industry being located in this area. All sectors of the food business area are found here, covering the total chain from plough to plate.

209

W. Hulsink and H. Dons (eds.), Pathways to High-tech Valleys and Research Triangles: Innovative Entrepreneurship, Knowledge Transfer and Cluster Formation in Europe and the United States, 209-223.

© 2008 Springer.

Primary production, the food-processing industry, packaging, production machinery, distribution, warehousing and quality control can be found in the cluster as well as competence for product and process development, both in industry and academia.

Today the food cluster is a part of the European market. The natural and traditional market is northern Europe from the UK to Russia. And the cluster dominates the Scandinavian food market. Due to the high concentration of retailers and wholesalers in the area and the well-developed distribution system, a company located in the Öresund area can, by working with a handful of customers and supporting companies, serve almost all of the 23 million consumers in Scandinavia and the 100 – 200 million in the Baltic Rim. The Baltic states offer good market potential and an expanding food market parallel with the rising living standards and changing consumer patterns.

Due to the breadth and depth of the industries in the cluster it is easy for foreign investors to establish themselves in the region and be able to participate in all the research and development activities of the food cluster. Several research parks are to be found in the area. Companies are engaged in co-operation in all parts of the industry and with academia. The combination of multinational companies, small innovative companies, cutting-edge academic centres, professional research institutions, competitive support organizations and co-operative authorities forms the key resource for the Öresund food cluster.

RESEARCH AND DEVELOPMENT

The Öresund Region is fifth in the league of high-density R&D areas in the EU. It provides a marketplace for business and research co-operation¹. The Öresund region has no less than eleven universities with a total of 120,000 students. The programme bringing the universities together has been dubbed the Öresund University. The Öresund University is a voluntary arrangement between universities on both sides of the Öresund sound. The participating universities and institutes are:

- Lund University (Scandinavia's largest establishment for higher education and research with over 38,000 students)
- The University of Copenhagen, Technical University of Denmark
- The Copenhagen Business School
- The Royal Veterinary and Agricultural University
- The Swedish University of Agricultural Science, Alnarp
- The Royal Danish School of Educational Studies
- The Royal Danish School of Pharmacy
- Roskilde University
- Malmö University College
- The Royal School of Library and Information Science.

Denmark and Sweden are among the most productive societies in terms of scientific research output per capita, as Sweden is ranked no. 3 and Denmark no. 6. Viewed in a regional perspective, the highest concentration of scientific output in the Scandinavian countries is produced in the Öresund Region. Thus, the Öresund Region is ranked no. 4, after London, Paris and Moscow, as the most productive

region in Europe regarding scientific research measured as the number of published publications per capita². The innovation climate can also be described in the following way:

- 2.85% of GDP spent on R&D (EU 1.19%, U.S. 1.98%)
- 22.9 EPO patent applications/1M inhabitants (EU 17.9, U.S. 29.5)
- 1431 scientific publications/1M inhabitants (U.K. 810, U.S. 708).

On the Swedish side, one finds education and research concerning food at Lund University, especially at the Lund Institute of Technology of Technology (LTH), at the School of Economics and Management and the Swedish University of Agricultural Science, Alnarp (SLU). On the Danish side, the leading universities in this field are The Royal Veterinary and Agricultural University and the Technical University of Denmark. Research in the region covers all kinds of scientific knowledge in the food chain from plough to plate as well as scientific knowledge in industries related to and supporting the food chain.

In addition to the universities, a number of organizations have been created to facilitate the exchange of research and development between universities and the food industry. In the Öresund cluster we can identify 12 research organizations dedicated to R&D in the food sector and 16 organizations that have as their mission to create and support co-operation between the food industry and the universities.

Turning our attention to research and development in companies, the Öresund region has a strong position in the food branch. Many Swedish and Danish food companies have located their R&D centres in this region, as have packaging, processing and distribution plants. Several of them are world-class actors, both in food and in related and supporting industries.

CHARACTERISTICS OF THE INNOVATION SYSTEM

If we relate the empirical data to the GEM model of Paquet and De la Motte we find that the necessary parts to form an innovation system are put in place³.

Groundings (supply determinants)

- Resources: Several unique resources. Unique knowledge. Some world class resources.
- Infrastructure: Well developed. Driven by the industry and supported by two national governments as well as the regional government in Scania.

Enterprises (structural determinants)

- Supplier and related industries: Several world-class companies in packaging, ingredients, equipment, freezing and transportation.
- Firm structure and strategies: Outspoken development ambitions. Coherent ambitions regarding international competition and development.

Markets (demand determinants)

- Local markets: Local markets with demanding consumers in specialized areas of development like health, food safety, ethical food, organic food and animal welfare. However, local markets offer too small volumes for profitable development, production and sales of high-value-added niche products. Access to external markets is necessary.

- Access to external markets: Most of the key players in the Öresund region are active in the European and Baltic markets – offering quantity as well as refined high-value-added products.

THE INNOVATION SYSTEM AS PART OF A TURNAROUND PROJECT

The industry is fragmented, and many companies still have a regional or national approach⁴. The reason for this is that historically the Swedish food market was protected from international competition. During the last decade, the Swedish food industry has been rapidly developing from a position as a sheltered national industry into a position as an industry exposed to strong international competition. This has occurred gradually in three steps.

The first step was already in 1986 when the Swedish government took a point of departure in a consumer-benefit approach and declared that the food sector gradually should be exposed to international competition. This induced a change in Swedish agriculture and many Swedish agricultural companies started an adaptation process to respond to the new working conditions. The second step and a major change in the competitive situation occurred when Sweden joined the European Community on 1 January 1995. Then the barriers to entry for finished food products were completely removed. The third step occurred on 1 May 2004 when the new member states joined the European Community. The Swedish food industry and agriculture are now exposed to fierce international competition. Our closest neighbour states, e.g., Lithuania and Poland, can produce agricultural bulk products at a cost that can never be met by Swedish farms and agricultural companies. In addition, the food industry has experienced the IT and Biotech revolutions, two important technological revolutions that have radically changed the working environment for food companies. If we add the increased consumer interest for food safety and healthy eating, we realize that the arena for the food industry has changed radically from the mid-nineties.

In this new situation, some companies have chosen to define the new situation as an exciting base for innovative food production and production of high-value-added food products, services and concepts. Other companies have responded with cost-cutting, seeking economy of scale and structural adjustment. The latter type of companies is experiencing continuous challenges, while the companies that have chosen innovation as the way to the future also found continuous challenges, but of a different kind. The fact that different parts of the industry chose different strategies to handle the new competitive situation has created a situation in which the industry is fragmented. The companies in the latter category have in general terms ventured into a turnaround strategy. They have developed new ways to interact in the regional innovation system and it is about these companies that this chapter tells a story.

IMPORTANT DIMENSIONS OF THE INNOVATION SYSTEM

We can also be more specific in the analysis of the ‘Öresund food cluster’, using the analysis dimensions developed by Enright⁵. Using these, the outcome is as follows.

Geographic scope. Approximately half of Swedish agricultural production is located in the southern part of Sweden. Other industrial and agricultural production and development areas, for example in the west and in the Linköping and Uppsala areas, are linked to the Öresund cluster through various kinds of networks. A large part of the R&D activities are performed in the Öresund area. On the Danish side, many of the corporate headquarters as well as R&D functions are located within the region, which in principle covers most of Denmark.

Density refers to the number and the economic importance of the businesses in the cluster. The number and importance of the actors are key factors for the two nations. The concentration index for the food industry is high in Skåne. For the most important local communities, it varies between 2.0 and 4.6⁶. Strong exporting companies are located within the Öresund cluster.

Width refers to the number of horizontally related industries in the cluster. Here we find the food cluster combined with related and supporting world-class industries in packaging, ingredients, marketing and transportation. High-class research in biotechnology and information and communication technology is to be found in the region. This creates opportunities for innovation in the borderland between industries.

Activity base refers to the number and nature of activities in the value-added chain. How much of core strategy is decided in the cluster? How active are the developers and innovators in marketing and corporate coordination in the region? The region is interesting because unique areas of competence are available; they are present in the whole value-added chain and in many related and supporting industries. A large number of innovation projects have been launched and many have been successful.

Depth refers to the extent of vertically related industries in a cluster. The whole value-added chain from plant engineering and primary production to food production and food services is present in the cluster. Retailing and food distribution companies are present in the cluster, but some key development functions must be sought in other locations. The marketing and R&D functions are well developed, however.

Growth potential is limited in the traditional food business based on bulk production. In functional foods, convenience food and food services the growth potential is clearly higher. The same positive growth situation is apparent for organic food and certain high-quality products and services.

Innovative capability. The ability of the cluster to generate important innovations in products, processes, design, marketing, logistics and management has been demonstrated in innovation processes resulting in various kinds of functional-food

products and in process innovations in the areas of traceability and quality control in the value-added chain. In related industries we also see innovations in, for example, packaging, ingredients and freezing technology.

Industrial organization. There is a tradition of good co-operation between industry and regional authorities in Scania – and in the Danish case between national government and research institutions. Several organizations and knowledge webs have been developed and the dynamic interaction is lively. According to a recent British study¹ the Scanian ability to incorporate interaction and trust in the competitive dynamics is among the best in the world.

Co-ordination mechanisms. The co-ordination of activities is basically non-hierarchical, based on both single-client and multi-client relations between research institutions, specialized consultants and the industry.

This means that the conditions for innovative dynamics are present in the cluster. The main characteristics of the Öresund food cluster are its breadth and depth. The region's history as the food centre of two nations explains the representation of almost all sectors in the food industry and supporting industries. In some areas, the actors have grown and developed from being the leading companies in Sweden and Denmark to large and/or leading actors in the European and world markets. The depth of the food industry in this region can be explained by the fact that it has proven necessary for the food industry in the Scandinavian countries to develop special areas of competence within agricultural research and the food industry as well as in supply and distribution systems in order to become competitive on international markets.

DEVELOPMENT IN THE ÖRESUND REGION

We have observed an interesting development in the Öresund food cluster. The mobility of highly qualified professionals is increasing. From interviews in small innovative companies we learned that several top-quality managers and researchers have decided to move from large companies to new innovative firms. The main reason for this willingness to move from large international companies to small entrepreneurial ones is the IT-crisis at the turn of the millennium. Several large high-tech companies went bankrupt or had to reduce the number of employees substantially. In 2002, 1,260 highly qualified engineers were unemployed in Sweden. Ericsson alone, with the problem-ridden Ericsson Mobile Platforms and Sony Ericsson located in Lund, had to let 452 qualified engineers leave the company⁸. A majority of the unemployed engineers did not want to leave their home town. Often their wives had important and interesting jobs and the children liked to live in Lund. Therefore, quite a few experienced and commercially seasoned managers left large companies for new, innovative companies in several industries. Even the food industry got an infusion from these professionals. Quite a few were willing to trade the security and status of the large organization for a position with higher risk in small innovative companies. The reasons behind these moves were

also related to the opportunity to be an important part of an exciting development, to have more control, less structure and a greater possibility to share the profits.

For these small companies this meant that they could acquire substantial experience and know-how as well as know-who, represented by the professional networks of their new top-notch managers. This kind of recruitment can be compared with a small football club recruiting star players from the Champions' League. Their ability to succeed increases substantially. The IT companies have now recovered and are growing quickly at the moment. However, only a minority of the newly recruited people are 'old' Ericsson employees returning. They stay on in their new companies, while Ericsson is recruiting new, young employees. The large corporations in a cluster thus have a role as a location-specific business and development school.

This is one advantage for the individual company that can be provided by the innovation system. The system can also offer advantages in that the close working environment surrounding the company offers a multitude of resources and areas of competence, external to the company but internal to the cluster. In addition, the innovation system can offer a supporting infrastructure and development visions driven by important entrepreneurs. In the Skåne Food Innovation System we also note that the most successful innovators often are 'Serial Innovators', meaning that they are active in the development of new products, services and concepts in many projects, with different partners and in various roles. The successful innovators thus serve as role models and also help the new entrepreneurs to mobilize courage and trust in their own ideas. These resources, which are specific to the cluster, make it a better place for business development than at other locations without a critical mass of resources, competent people and strategic visions. Innovation systems and clusters have at least three important effects on the development and innovation process:

- The productivity increases. The individual company can act as if they had scale economies in a number of areas of competence and technology without investing in them. Outsourcing parts of the development process is cost-efficient and maintains flexibility.
- The development speed and intensity increase. Simultaneous use of many development arenas and well co-ordinated activities can shorten the time from idea to finished product, service or concept.
- New companies are created. The cluster creates opportunities for simultaneous competition and co-operation between a number of large and small companies. From this, the seeds for the creation of new business concepts will grow and create new species of companies, resulting from unique combinations of resources⁹.

FOOD INNOVATION AT INTERFACES

Food Innovation at Interfaces is a 10-year project aiming at increased innovation and competitiveness in the Swedish food industry. One half of the resources in the project is invested by the Swedish national agency for innovation – VINNOVA. The

other half of the resources originates from the business community and regional institutions. Vinnova introduced a competition in 2001, a competition in which those could enter who could present a solid innovation project with unique resources and substantial growth opportunities. 159 proposals entered the competition and three won, Food Innovation at Interfaces was one of the three winners. In this competition one could find proposals from all industries and the fact that the food industry came out as a winner was very encouraging for the actors in the industry. It was seen as a signal that the food industry had a future and that it was worthwhile to participate in new development projects. The project started in July 2003. Innovation is defined as a process, "A New Way to Do things Commercially"¹⁰. This is very important for the management of the innovation system. An invention is not an innovation according to this definition, neither is a patent. It is only when a new idea has been processed all the way through the innovation process and created a commercial result that it can be defined as an innovation. This has been new thinking for some technical developers who earlier saw it as sufficient to create new technology. The result in the project has been better communication between the technical and commercial competence.

Interfaces

One basic belief in the project is that innovations are born at interfaces. Therefore we encourage interaction at interfaces between different areas of scientific knowledge, between different technologies, between academic research and commercial enterprises as well as interfaces between private and public organizations. Knowledge integration¹¹ between different knowledge areas will produce new products, services and concepts.

Triple Helix

The innovation system is a Triple Helix activity. By Triple Helix we mean co-operation between companies, researchers and society. The benefit of this approach can be illustrated with one of the key development areas, Functional Food. There we find knowledge integration between nutrition, medicine, food technology, food engineering, marketing and consumer research on the research side. Food companies, food ingredient companies and packaging companies join from the corporate side. The county government has the responsibility for the healthcare in the region and can enter the co-operation with a lot of knowledge, but also as a major receiver of the innovation results. In the Triple Helix network, innovation is the main activity. In order to achieve this, a solid trust must exist among the parties involved. The major challenge is that the different actors in the joint activity have different ultimate goals. It is possible, however, to define projects of common interest in which the actors can co-operate with a common goal for the project. As a result of the joint projects and the knowledge integration, no single actor owns the strategic problem. It is therefore important to have agreements about how profits from innovations will be shared¹².

Innovation System leadership

The changing competitive conditions that occurred during the 1990s have created thoughts among leading industrialists, in the regional government and among researchers. As a result, the three parties created a joint network organization called 'The Scania Food Academy'. This was a Triple Helix organization, even if the concept had not been launched at that time. In the organization, leading actors from the region did investigations and started joint actions in areas related to competence and competitiveness. Food and Agriculture are extremely important industries in our region. The insight that major changes were ahead made leading actors work hard together to improve the future for the food industry. It is also important in this context that the original initiative came from the food industry. This has created a Triple Helix organization in which the industry has had a leading role for more than one decade. This was noted by Björn Åsheim and Lars Coenen in a study in which they distinguish three types of regional innovation systems¹³.

The first type of regional innovation system is the territorially embedded regional innovation system, where firms base their innovation activity mainly on localized, inter-firm learning processes stimulated by the conjunction of geographical and relational proximity without much interaction with knowledge-generating organizations, i.e. R & D organizations and universities. The second type is the regionally networked innovation system. The firms and organizations are also embedded in a specific region and characterized by localized, interactive learning. However, through the intentional strengthening of the region's institutional infrastructure, for example through a stronger, more developed role for regionally based R & D institutes, vocational training organizations and other institutions in firms' innovation processes, these systems have a more planned character involving public-private partnerships and co-operation. The third main type of Regional Innovation Systems, the regionalized national innovation system, differs from the preceding cases in several ways. First, parts of the industry and the institutional infrastructure are more functionally integrated into national or international innovation systems, i.e. innovation activities take place primarily in co-operation with actors outside the region. Second, the collaboration between organizations within this type of Regional Innovation System conforms more closely to the linear model, as the co-operation primarily involves specific projects to develop more radical innovation based on formal analytical-scientific knowledge.

Åsheim and Coenen identify the Skåne Food Innovation Network as a regionally networked innovation system¹⁴. They also say the following about the regionally networked innovation system:

"Similar to the regionalized national innovation system, the knowledge infrastructure plays an indispensable role. But in contrast to it, the cluster is not science-driven but market-driven. In comparison to the territorially embedded regional innovation system, the networked Regional Innovation System often involves more advanced technologies combining analytic and synthetic knowledge"¹⁵.

From the Food Innovation at Interfaces it can be noted that this interface between analytical and synthetic knowledge has been the greenhouse of many innovative ideas. The 'Scandia Food Academy' was and is an extremely small and flexible

network organization. Through the co-operation over the years, it has been seen as a constructive force in the regional development and the level of trust is high.

Therefore, when competing for the Vinnova Vinnväxt prize it was seen as quite right that this small organization should represent the joint efforts in the region. As a result, the innovation system is led by a strong and competent board in a very small network organization. This has proven to be a cost-efficient way to lead the innovation system and to channel the resources. Decision-making speed and ability to adapt to changing conditions is important in the leadership of these innovation processes.

RESULTS AND LEARNING FROM THE FIRST THREE YEARS

During the first three years projects have been created for SEK 48 million in cash grants from Food Innovation at Interfaces including Vinnova. The regional partners have provided human resources and equipment in the range of SEK 23 million. It is estimated that the active companies and organizations participating in the Food Innovation at Interfaces network and process have contributed SEK 13 million in hours worked for the venture. This adds up to SEK 84 million, corresponding to EUR 9.2 million.

During the first three years

- 87 projects of varying size have been processed, developed and documented
- 141 companies with one or more participants have taken part
- 74 researchers – professors, postgraduate and doctoral students, and undergraduates – have participated actively in development work.

During this period, an extensive network has been established at the interfaces with the food industry, with stakeholders from various parts of the chain of value. This has led to a marked increase in interest for Food Innovation at Interfaces on the part of established companies in the food industry since the start in autumn 2003, mainly from the region but also from other parts of southern and central Sweden. The majority of the enquiries that come from individual companies lead to a dialogue with one or more research institutions and there is therefore a close association with needs-motivated research.

During the first three-year period, the venture has mainly entailed stimulating the innovation system by providing new competence and deepening knowledge about the needs, prerequisites and opportunities for renewal of the food industry. The project has been evaluated by external national evaluators and by an international expert group. In the report from the national evaluation team, the three assessors have been able to note that

“The overall impression, based on this questionnaire and the interviews we have carried out, is positive, even very positive”.

“When we compare Food Innovation at Interfaces with other similar programmes, it is highly regarded by the participants. Tangible results have been achieved after only three years”.

“This involves attitudes, collaboration, competence, but also about tangible results in industry to an extent that usually takes more than three years to achieve, if at all”¹⁶.

This assessment provides a clear indication to continue and deepen the systemic approach in process work. The development of an ethnic network has considerably increased diversity in Food Innovation at Interfaces. This ethnic network consists of food entrepreneurs with a background in other countries than Sweden. When offered the opportunity to innovate and help their businesses to grow, this group has responded very favourably. Thus this network has given a considerable contribution to the dynamics of the food industry in Skåne. The key development activities are based on the creation of a large number of meeting places/projects where representatives of various interests and competencies can exchange and discuss ideas and develop creative solutions and business ideas. Another important group of activities aim at support to research initiatives aiming at new knowledge and a third group of initiatives aim at investment in innovation training at various levels.

EXAMPLES OF PROMISING PROJECTS¹⁷

Innovations in retailing and retail innovations

This project area deals with aspects of retailing and consumer behaviour that are related to food innovation. It is of fundamental importance to understand the processes whereby the consumer adopts new products as well as the commercial and institutional conditions in which retailers of various kinds accept, promote and sell new products successfully. Focus in this area is to measure the number of innovations in food retailing by comparing innovations in private labels with innovations in manufacturers' brands. Price levels, product characteristics and consumer response have been studied. This project has already gained a lot of attention from the trade and retail industry and has stimulated several discussions, workshops and initiatives in order to promote innovative projects at the interface between retailing and food production.

Innovation clusters in food service

In one convenience-food project – 'Lönsammare krog' – models and instruments have been developed that can be used in analysis of the economic consequences that follow from how much food and what kinds of food that can be pre-produced in the food service value-added chain. This project has been successful and innovative change activities have started between various actors in the value-added chain.

Opticool

The project deals with optimization of quality and best-before date in the whole cold chain from food producer via transport/storage and wholesaler to catering restaurants. The aim of this project is to make a continuous measurement of the cold chain in different flows of meat products the whole way from producer to catering restaurants over an extended period of time. The accumulated effects of temperature on products over time will be monitored and measured by The Bioett System. The data acquired from the measurements can then be used to improve the quality and in

discussions about best-before date, and also to verify the simulation model that has been developed in the parallel project LOGISAFE. As a result of this project there is an initiative to start a 'club' for users of The Bioett System including retailers.

FUNCFOOD – an inter-disciplinary PhD programme in functional-food science

FUNCFOOD is an inter-disciplinary PhD programme in functional-food science at Lund University, designed to provide interdisciplinary and generic research. The programme is performed in collaboration with the food industry and representatives of the commercial and industrial development and the health and medical-care system in the Scania region. Until now, nine PhD students have started their PhD work. FUNCFOOD comprises the following projects, which has been selected based on an international expertise evaluation:

- Combined effects of dietary fibres and gut associated bacteria to optimize gut health and counteract inflammatory conditions
- Alpha-linolenic-acid-rich lipid formulations for use in functional foods
- Design of cereal foods with advantageous effects in relation to IRS; exploiting a combination of food concepts
- Communication and marketing strategies in the functional-food area
- Healthy oat products: a basis for quality control from chemical and physiological studies
- Effective communication strategies for functional foods.

In each project one or several industrial partners participate.

Within FUNCFOOD there is a continuous discussion involving representatives for the health and medical-care system as well as industry partners regarding the potential of foods with added health benefits and how FUNCFOOD can contribute to strengthen interactions and implementation. The PhD students therefore receive specific skills in communication with other competences involved in the food innovation chain. The FUNCFOOD programme describes a unique interdisciplinary research effort involving industrial partners and has received international interest as an important engine in the food innovation cycle.

The International Food & Health Innovation Conference 2006

With the purpose of exposing research competence and know-how in the academic and industrial network in the region, Food Innovation at Interfaces, the Functional Food Science Centre and the School of Economics & Management have been engaged as a co-organizers of the International Food & Health Innovation Conference 2006. The conference on 25-27 October 2006 had 257 participants and the feed-back in the evaluation was very good. The conference also represents an insight into the innovation system that international bench learning and exchange of best practices with centres of excellence around the world is of utmost importance to upgrade the innovative dynamics in the region.

Leadership in innovation systems

Leadership and management issues in innovation clusters and innovation systems are problematic. Most research in the area is based on the assumption about an existing organization, defined roles, a certain amount of organizational structure and legitimate power structures. Many of these assumptions are not valid in innovation clusters and innovation systems. Therefore it is essential to capture the learning from Food Innovation at Interfaces in a systematic way. As a consequence, key areas of interest in this research are interfaces between different areas of competence, different power structures and different spheres of reasoning and logic. Closely related to the leadership issue is the evaluation issue. How can innovation systems and clusters be evaluated in a forward looking and constructive way, so that those who invest can judge if the money invested is well spent? In this evaluation it must be understood that developing an innovation system contains many more variables than investment in a specific innovation project. The principal approach to evaluation, learning and leadership in this project is to use a method in which the researchers study and learn about the relationship between the proactive system setting and the responsive system acting. The dialogue between the really important actions in the system, the actions that produce products, services and concepts, and the planned system setting is developed in such a way that bench learning and reflective creativity are enhanced. Development of relevant concepts and language to understand and interpret the situation is also of utmost importance. Last but not least is the implication of this method that the results are not only identified and documented, they are also used in action in the ongoing learning process of the innovation system, thus contributing to improve responsive system acting¹⁸.

FUTURE CHALLENGES

The 10-year perspective and the sustained investment for at least 10 years create a good breeding ground for innovation, but also for development of the innovative capability in the region. The role of the innovation clusters is to create innovations. The role of the innovation system is to support and develop the clusters, create learning opportunities, share knowledge and grow new knowledge and new capabilities that create sustainable innovation capacity and ability. These are the major challenges for the innovation system. The role of established institutions and large organizations will be further analysed in the coming years. One insight from this project is that large organizations may not be successful in innovation even if their top management is firmly dedicated to an innovation strategy. It has also been noted that innovation-supporting organizations need to adapt very much to the specific needs of the individual entrepreneur and that these needs vary substantially between industries. Therefore a 'one-size-for-all' entrepreneurial coaching can have detrimental effects. As a result of this insight, a new method for co-operation and information exchange between different innovation agencies is under development. The major task in this project for the coming years is to upgrade the innovative capability of the innovation system. In this project, a foresight process will be used

in parallel with bench-learning activities together with European and other international partners.

NOTES

- ¹ www.ideon.se
- ² www.foodoresund.com
- ³ De la Mothe, J. and Paquet, G. (eds.) (1998), *Local and Regional Systems of Innovation*, Dordrecht, NL: Kluwer.
- ⁴ Ibid. pp. 58–59.
- ⁵ Enright, M. (2000b), 'The Globalization of Competition and the Localization of Competitive Advantage: Policies towards Regional Clustering', in Hood, N. and Young, S. (eds.), *The Globalisation of Multinational Enterprise Activity and Economic Development*. London, McMillan.
- ⁶ Nilsson, M., Henning-Svensson, M & Wilkenson, O: (2003) Skånska kluster & profilområden. Region Skåne, Malmö.
- ⁷ Mellentin et al. (2001), *International Functional Food Centers. Benchmarking of Best Practices*. London: The Centre for Food and Health Studies. Consultancy report for Scottish Enterprise.
- ⁸ <http://di.se> Nov 14 2002.
- ⁹ Porter, M. E. (1998b), *On Competition*, Harvard Business Review Books.
- ¹⁰ Porter, M. (1998a), 'Clusters and Competition', *Harvard Business Review*, Nov–Dec.
- ¹¹ Grant, R.M. (1996), 'Toward a knowledge based theory of the firm', *Strategic Management Journal*, 17, Special Issue Winter, 93–109.
- ¹² See e.g. Leydesdorff, L and Etzkowitz, H: (2001) The Transformation Of University-industry-government Relations. *Electronic Journal of Sociology* (2001) ASSN:1198 3655.
- ¹³ Asheim, B. T. & Coenen, L: (2005) Knowledge bases and regional innovation systems: Comparing Nordic Clusters in Research Policy 34 pp 1173-1190 and also in Coenen, L: (2006) Faraway, so close! The changing geographies of regional innovation. CIRCLE. Lund University, Lund p 73 –
- ¹⁴ Ibid. p. 78
- ¹⁵ Ibid. p. 74
- ¹⁶ Eriksson, B, Gälldin-Holmberg, B and Sarv, H (2006) Analys av web-enkät. Kortversion Vinnova report.
- ¹⁷ This section is based on the Three year evaluation report from Food Innovation at Interfaces with contributions from Inger Björck, Jan Brattström, Kjell Olsson, Ann-Marie Camper and Lotta Törner and the author of this chapter.
- ¹⁸ See e.g. Sarv, H., Aronsson, H; Carlsson, J and Lindskog, M (2002) Systemiskt lärande som ansats i logistikutvecklingen – en studie av internethandeln. Vinnova. Stockholm.

REFERENCES

- Asheim, B.T. and Coenen, L., 2005. Knowledge bases and regional innovation systems: comparing Nordic Clusters. *Research Policy*, 34 (8), 1173-1190
- De la Mothe, J. and Paquet, G., 1998. *Local and regional systems of innovation*. Kluwer, Amsterdam.
- Enright, M., 2000. The globalization of competition and the localization of competitive advantage: policies towards regional clustering. In: Hood, N. and Young, S. eds. *The globalisation of multinational enterprise activity and economic development*. McMillan, London, 303-331.
- Eriksson, B., Gälldin-Holmberg, B. and Sarv, H., 2006. *Analys av web-enkät: kortversion Vinnova report*.
- Grant, R.M., 1996. Toward a knowledge-based theory of the firm. *Strategic Management Journal*, 17, 109-122.
- Ideon AB, 2006. *IDEON science park*. Ideon AB. Available: [<http://www.ideon.se/>].
- Leydesdorff, L. and Etzkowitz, H., 2001. The transformation of university-industry-government relations. *Electronic Journal of Sociology*, 5 (4). [<http://dlist.sir.arizona.edu/114/01/th.html>]
- Mellentin, J., 2001. *International Functional Food Centers: benchmarking of best practices: consultancy report for Scottish Enterprise*. The Centre for Food and Health Studies, London.
- Nilsson, M., Henning-Svensson, M. and Wilkenson, O., 2003. *Skånska kluster and profilområden*. Region Skåne, Malmö.

- Olsson, K. and Lagnevik, M., 2006. *Food innovation at interfaces: three-year report 1 July 2003 – 30 June 2006: Vinnova report.*
- Porter, M.E., 1998a. Clusters and the new economics of competition. *Harvard Business Review*, 76 (6), 77-90.
- Porter, M.E., 1998b. *On competition.* Harvard Business School Press, Boston.
- Region Skåne, 2006. *Öresund food excellence.* Region Skåne. Available: [<http://www.foodoresund.com/>].
- Sarv, H., Aronsson, H., Carlsson, J., et al., 2002. *Systemiskt lärande som ansats i logistikutvecklingen: en studie av svensk internethandel.* Vinnova. Vinnova-Rapport no. VR 2002:9.