

REPORTS 184

“IF YOU RUN AFTER TWO HARES, YOU WILL CATCH NEITHER”

– THE COOPERATION BETWEEN UNIVERSITIES AND FOOD SECTOR
COMPANIES IN AOMORI PREFECTURE AND SOUTH OSTROBOTHNIA REGION

AAPO JUMPPANEN, FUMIHIKO KOYATA AND TIMO SUUTARI



“IF YOU RUN AFTER TWO HARES, YOU WILL CATCH NEITHER”

– THE COOPERATION BETWEEN UNIVERSITIES AND
FOOD SECTOR COMPANIES IN AOMORI PREFECTURE
AND SOUTH OSTROBOTHNIA REGION

AAPO JUMPPANEN, FUMIHIKO KOYATA AND TIMO SUUTARI



Publisher University of Helsinki
Ruralia Institute
www.helsinki.fi/ruralia

Lönnrotinkatu 7 Kampusranta 9 C
50100 FI-MIKKELI 60320 FI-SEINÄJOKI

Series Reports 184

Cover Photo Timo Suutari

ISBN 978-951-51-3758-6 (pdf)
ISSN 1796-0630 (pdf)

FOREWORD

Universities are key drivers of the development and renewal of societies, regions and firms. The emphasis on knowledge and expertise has increased the importance of universities, but also forced universities to change. Discussion about the role of universities has increased, particularly since the autonomy of knowledge production within universities has been challenged, and is shifting towards decentralized and application-oriented knowledge production, in which an increasing part of the research is carried out in multidisciplinary research projects and based on external funding. The end users of knowledge, such as firms, are increasingly involved in the joint development of new knowledge and seek to solve problems in collaboration with researchers. Therefore, knowledge production is not privileged to universities and research institutions, but new knowledge is increasingly produced in different contexts of applications within companies.

This publication focuses on the changing role of universities in regional contexts. The research subject is academy-industry collaboration, and more precisely, cooperation between universities and food sector companies. The study is based on ten interviews with university professors, senior researchers and research administration managers in Japan and Finland. The interviews were conducted between 2015 and 2017. Associate Professor Fumihiko Koyata (Hirosaki University, Faculty of Humanities and Social Sciences) and University researcher Aapo Jumppanen (The University of Helsinki Ruralia Institute) conducted the first set of interviews on February 2015 in the cities of Hirosaki and Aomori in the Aomori Prefecture of Tohoku region in Japan. Aapo Jumppanen conducted the second set of interviews during spring and autumn 2017 in the city of Seinäjoki, in the South Ostrobothnia region, Finland.

The joint funding of the Hirosaki University, Faculty of Humanities and Social Sciences, University Consortium of Seinäjoki and University of Helsinki Ruralia Institute have made the writing of this research report possible. The European Union's regional development fund (ERDF) and the Regional Council of South Ostrobothnia have supported our aspirations as the research project was conducted as a part of the ERDF-funded Agrobioeconomy Seinäjoki project. We want to thank the financiers for the support that made this study possible and especially we would like to thank all the interviewees, who gave us valuable comments. We hope that this report will offer fresh and valuable insights for the regional development and cooperation between universities and the food sector in Finland, Japan and elsewhere.

Seinäjoki and Hirosaki
August 2018

The Authors

CONTENTS

ABSTRACT	7
1 THE THIRD MISSION OF THE UNIVERSITY?	9
1.1 Academic Engagement at Regional Level.....	9
1.2 Materials and Methods	10
2 DESCRIPTION OF THE REGIONS AND UNIVERSITY ACTORS INVOLVED	12
2.1 Aomori Prefecture: The Role of Food Industries in Regional Economy and Hirosaki University	12
2.2 South Ostrobothnia: The Role of Food Industries in Regional Economy and the University Consortium of Seinäjoki.....	14
3 KEY FINDINGS	17
3.1 The Overall Situation of Food Sector Companies in South Ostrobothnia and Aomori.....	17
3.2 The Nature of Academic Engagement in Aomori and South Ostrobothnia	18
3.2.1 How the Academic Engagement Projects Get Started?.....	18
3.2.2 Forms of Academy-Industry Cooperation	19
3.2.3 The Role of Academic Engagement Projects in Gaining Academic Merit...	20
3.2.4 The Sources of Funding	22
3.3 The Challenges of Academy-Industry Cooperation within Food Sector	22
3.3.1 Does Size Matter? Academic Engagement with Big and Small Companies	23
3.3.2 Evaluating the Experiences of Academic Engagement	24
4 CONCLUSIONS	25
5 RECOMMENDATIONS	27
REFERENCES	28
LIST OF INFORMANTS	30

ABSTRACT

This report focuses on the changing role of the universities in regional context. The research subject is academic engagement between university actors and food sector companies in Aomori Prefecture in northern Japan and in South Ostrobothnia, western Finland. The organizations under research are Hirosaki University from Aomori and Seinäjoki University Consortium and the University Association of South Ostrobothnia. The study is based on 10 interviews of university professors, senior researchers and research administration managers. Interviews were made between 2015–2017.

The food industries of Aomori Prefecture and South Ostrobothnia are SME dominated, but a few big companies are the most important single actors in the regional economies. In both regions, company size affected the methods and likelihood of successful academic engagement. Big companies in both regions have good resources such as their own R&D staff, generous budgets and better understanding about the market situation and the limitations and possibilities of the academic research, compared with SMEs, whereas small companies are more agile and have more open disclosure policies.

The nature of academy-industry cooperation is based on applied research projects that use the triple-helix and quadruple-helix models. In both regions, individual researchers collaborate with companies in such fields as product and service development and market research. In Hirosaki University, the academic engagement is also organized through more institutionalized forms of interac-

tion, such as the regional Apple Committee that brings together companies, apple producers, regional and local officials and researchers to create new products and business opportunities within the apple cluster together. The Hirosaki University Institute for Food Sciences also has a donation laboratory, where the production of practice-oriented dissertations is possible. This type of strategically focused innovation community is missing in South Ostrobothnia, although there are project-based temporary organizations such as AB Seinäjoki to help the overall development of the agrobioeconomy sector of the region, including the food sector.

The methods by which the regions started academic engagement with companies shared many similarities, but there were also notable differences. It seems that Hirosaki University has a more systematic approach supporting the starting of academic engagement, whereas the actors in South Ostrobothnia rely more on personal relations. A more institutionalized form fits the more numerous academic engagement needs of Aomori Prefecture whereas in South Ostrobothnia the demand for academic engagement is more limited and the scholars can rely more on personal relationships.

In both regions, academic engagement projects as such have a limited role in gaining academic merit. Publishing in peer-reviewed journals is the most important indicator for advancing an academic career. Researchers also faced similar problems in conducting academic engagement projects: the lack of time and the different logics of business and academic research as typical challenges.

1 THE THIRD MISSION OF THE UNIVERSITY?

1.1 ACADEMIC ENGAGEMENT AT REGIONAL LEVEL

Throughout their history, universities have been important elements and drivers of the development and renewal of societies, regions and firms. The emphasis on knowledge, expertise and know-how as key production factors has further increased the importance of universities, but also forced universities to change. Discussion about the role of universities as part of the renewal of societies has increased, particularly since the mid-1990s. In particular, Michael Gibbons and his contributing partners opened a debate on new ways of producing scientific knowledge in their book *The Dynamics of Science and Research in Contemporary Societies*, published in 1994. The main claim of the book was that the autonomy of knowledge production within universities and disciplines is shifting towards decentralized and application-oriented knowledge production, in which an increasing part of the research is carried out in multidisciplinary research projects and based on external funding. These joint projects are characterized by the fact that, alongside researchers in different fields, the end users of knowledge are increasingly involved in the joint development of information and seek to solve problems in collaboration with researchers. (See Nowotny, Scott & Gibbons 2003, 179, 186.) Therefore, research communities will become more porous at their borders, which, on the other hand, will also enable the creation of different forms of co-operation. In addition to this, knowledge production is not privileged to research and higher education institutions, but new knowledge is increasingly produced in different contexts of applications, i.e. companies and advisory and intermediary organizations.

Universities across the world are seen as essential for generating knowledge and providing higher education for the population. Nevertheless, they also have a so-called third mission, which is to create and maintain links with knowledge users and facilitate the transfer of technology. (Perkmann et al. 2013, 421.) A frequently repeated statement of the importance of knowledge, know-how and in-

novations as sources of growth is even more relevant. In recent years, much has been said about the change in innovation activity to become more transparent, demand-driven and user-oriented. At the same time, universities and scientific knowledge have been challenged to adapt and respond to ever-changing and tightening innovation competition between nations, regions and firms. As a result, universities are increasingly seen as one main driver for national and regional growth and competitiveness. This is also reflected in the debate about how to better utilize and increase the effectiveness of research results, especially in the emergence of new growth sectors. Many national and regional strategies have set up a wide range of expectations for universities, both in terms of promotion of innovation and support for well-being (see Ritsilä, Nieminen & Sotarauta 2007, 15).

To describe the roles of the universities in a more nuanced way, they can be classified into four categories, i.e. education, the production of new knowledge, the strengthening of local scientific and technological problem-solving capabilities, and the provision of interpreting capabilities for exploration. The first two of these are, in a way, the traditional tasks of the university, through which human capital is strengthened by providing educated people for society. Problem-solving capacity, in turn, means the university's ability to collaborate directly with companies, for example in the form of joint research projects. Universities may also make their research infrastructure available for industry use. Providing interpretative facilities, on the other hand, means searching for untapped opportunities together with other social actors, in which different work seminars, co-operation platforms or alumni networks provide platforms for interaction. (Lester & Sotarauta 2007, 32–33.)

The third mission of universities seems sometimes to be a new phenomenon merely a couple of decades old (E.g. Lester 2007, 9), but scholars like Philippe Laredo (2007) emphasize that it is actually a venerable one. Academia has interacted with the surrounding society and economy for centuries and well before the discussion about the third mission began. For Laredo, the central role of the university has been the education of professionals

for different functions in society. It is not, however, often considered part of the third mission of the university. (Laredo 2007, 441–442, 445–446.)

One way of fulfilling the third mission is the commercialization of academic knowledge, which involves the patenting and licensing of innovations and academic entrepreneurship. Academic literature, policy makers and regional and national level officials emphasize commercialization as it creates strong links between academic knowledge and economic activity. Many universities have thus adopted policies and created structures such as science parks, business incubators and technology transfer offices to support commercialization (Perkmann et al. 2013, 421). Scholars like Laredo have nevertheless openly criticized the idea of these “entrepreneurial universities” that apply for patents, derive revenue from contracts and give birth to spin-off firms (Laredo 2007, 444–446).

Although the commercialization of academic research is an important part of the third mission, it is not the whole of it. According to Markus Perkmann et al. (2013), the larger sphere of cooperation can be described by the concept of “academic engagement”. It involves formal and informal activities between academic and non-academic organizations like consulting, contract research and collaborative research, as well as networking and giving ad hoc advice to practitioners. (Ibid. 423–424.)

At the regional level, the role of academic engagement is important for keeping up the dynamism of the regional economy and helping its actors to adapt to changes in markets and technologies. Local universities play a key role in this process by helping local firms to adapt to these changes and take up new technologies and market knowledge. Many initiatives are made for the patenting and licensing of intellectual property and the provision of these assets to local firms. Nevertheless, these direct contributions are not usually the most important functions of a university, as the most important contribution is education. Universities also serve as a public space that contributes to the local innovation performance by attracting financial, knowledge and human resources to the region. They can also help to adapt outside knowledge to local conditions and thus support the innovation capabilities of the local economy. Universities can also recognize, unlock and redirect existing local knowledge that is not used in the best possible way and put it into productive use. (Lester & Sotarauta 2007, 1–2; Lester 2007, 11, 23.)

In this report, we will study the modes of academic engagement between university actors and

food sector companies in Aomori Prefecture in northern Japan and in South Ostrobothnia, western Finland. The organizations under research are Hirosaki University from Aomori and Seinäjoki University Consortium and the University Association of South Ostrobothnia. The study is descriptive and comparative by nature and is aimed to bring more self-understanding about the different ways of organizing academic cooperation on these rural regions.

We admit that both the cultural and administrative contexts of the regions are fundamentally different, and thus direct transfer of any best practices is extremely difficult. Nevertheless, university actors in both countries have the same mission: to find new ways to support regional economic development. This same goal is shared with numerous national, regional and local governments throughout the world (Lester 2007, 11). As the underlying logic of the academic engagement is the same, learning from each other’s experience at a general level is thus possible. The report is also aimed at increasing the self-awareness of the regional actors of the methods and challenges of food industry-academia cooperation. We also hope that our examples will be of help to regional developers outside Aomori and South Ostrobothnia as well.

1.2 MATERIALS AND METHODS

This study was carried out between 2015–2018. In late February 2015, four semi-structured research interview sessions for five people were organized on the premises of Hirosaki University (see appendix). The interviews were conducted in English and Japanese and were organized by Associate Professor Fumihiko Koyata from the Hirosaki University Faculty of Humanities and Social Sciences. Mr. Koyata also participated all interview sessions as a second interviewer and translator. The informants were professors of Hirosaki University who had been active in academic engagement with the food sector for several years.

The second set of interviews was organized between January and November 2017 in Seinäjoki, Finland. Five people were interviewed in five different sessions. The interviews were conducted in Finnish. The academics interviewed in Seinäjoki represented three different universities (Turku, Vaasa, and Helsinki) and one nonprofit organization (The University Association of South Ostrobothnia) responsible for the fundraising of the regional professor network Epanet. All interviewees

had several years of experience in cooperating with food sector companies.

The Interviews followed a similar semi-structured form in Finland and Japan. They began with background questions such as the informant's field of research, current research topic(s) and the number of partnerships they had with food sector companies. This set of questions was followed by questions concerning the organization of the academic engagement activity, such as the role of intermediaries and triple- and quadruple helix models, the most important financiers and how to combine the requirements of academic publishing and the practical needs of the companies and so on. The last set of questions focused on the characteristics and requirements for research and development projects with food companies. The interviewees were asked such questions as: what kind of cooperation projects do they have with food companies. What are the typical challenges for cooperation? Does the academic engagement with SMEs differ from engagement with large enterprises?

The interviews were transcribed and analyzed using qualitative textual content analysis. Accord-

ing to Hsiu-Fang Hsieh and Sarah E. Shannon (2005), textual content analysis can be divided into three different approaches they call conventional, directed and summative. Within this study, the conventional context analysis forms the main methodological base. Its coding categories are based merely on observations from the original textual data, whereas the directed approach relies more heavily on theories for coding and the summative approach on pre-identified keywords. (Ibid. 1277–1286.)

The data analysis followed the stages of conventional context analysis (Hsieh 2005, 1279). The transcribed texts were first read through to obtain a good overall picture of their contents. Then this data was encoded by paying attention to words that seemed to form the core thoughts and concepts, which was supported by the note taking and creation of initial categories. These categories were then used to group codes into broader meaningful clusters that formed the base for the key conclusions of this study.

2 DESCRIPTION OF THE REGIONS AND UNIVERSITY ACTORS INVOLVED

2.1 AOMORI PREFECTURE: THE ROLE OF FOOD INDUSTRIES IN REGIONAL ECONOMY AND HIROSAKI UNIVERSITY

Aomori Prefecture is in the most northern part of Honshu Island and at the same latitude as New York, Beijing, Rome, and Madrid. Aomori Prefecture consists of 10 cities, 22 towns, and 8 villages. The population of Aomori Prefecture is 1,308,265 people (2017), which places it 31st place among the metropolises and districts of Japan. The area of Aomori is 9,644.55 square kilometers and it is the eight largest prefecture in Japan. There are three representative cities in Aomori: Aomori-shi 313,000, Hachinohe-shi 223,000 and Hirosaki-shi 173,000 inhabitants respectively as of April 2018. (National Census of Japan 2017, Aomori Prefectural Government 2018; Aomori City 2018; Hachinohe City 2018; Hirosaki City 2018.)

Aomori is an agricultural prefecture and well known for its apple, garlic, and burdock production. Its production of apples was 447,800 tons in 2016 (Ministry of Agriculture, Forestry and Fisheries (MAFF 2017a), which is 58.5% of the total production of Japan. As for garlic, Aomori produced 14,200 tons, and 47,800 tons of burdock. These production shares are 67.2%, and 35.3% of the overall national production (MAFF 2017c). Aomori is also the second largest producer of yam in Japan.

The fishery is also important for the regional economy. Warm and cold sea currents clash near the shore, which makes the coastal waters of Aomori ideal for fishing and the catch of many commercially important fish such as flatfish (*Hypomesus transpacificus*), Japanese icefish and cuttlefish is the second highest in Japan. Also, the catches of scallop and corbicula hold the second place in Japan (MAFF 2017b). The Gulf of Mutsu in the north-east of the prefecture is a centre for fish farming as its calm waters create ideal conditions for the industry. (Aomori Prefectural Government 2018.)

Aomori has rich forest resources. The forest cover of the prefecture is about 640,000 hectares,

which is approximately 66% of the total area of Aomori (The Forestry Agency 2012). The natural beech forest in the Shirokami Mountains is the biggest in East Asia and is listed as a UNESCO World Heritage Property.

The most important manufacturing industries of the region in terms of manufacture shipments are nonferrous metals, followed by food, pulp and paper, steel and industrial machines. Altogether, the aforementioned five product categories constitute 65.2% of the manufactured shipments of the region. (Aomori Prefectural Government 2018.)

The agriculture, forestry and marine production industries are being developed under the coordinated policy of the so-called “local sixth sector industrialization”. Primary production, food industries and retailers do close cooperation to increase the profitability of the regional products. The policy has several sub-policies, such as supporting the networking of the food sector actors to increase connectedness and trust and a commitment to creating safe, reliable high-quality products. On the national level, the Japanese Ministry of Agriculture, Forestry and Fisheries promotes this policy. (Aomori Prefectural Government 2018; Ministry of Agriculture, Forestry and Fisheries 2018.) It was developed to support the domestic agricultural production of Japan, which has decreased because of intensive international competition on Japanese food markets, created by such trade agreements as the Trans-Pacific Strategic Economic Partnership Agreement (TPP). The quality of the imported food as well as its ecological footprint, however, are a concern for certain groups of Japanese consumers. The promoting of domestic agriculture through the sixth industrialization policy is seen as the solution to these consumer needs. The name of the policy comes from the Japanese system of industry classification, in which primary production is called the first industry, food processing the second industry and retail is known as the third industry. Number 6 symbolizes the multiplying effect of these three industries together. (Nakano 2014, 60–61.)

The sixth industrialization policy is also connected to the initiatives of the Japanese Ministry of Agriculture, Forestry and Fisheries (MAFF) to

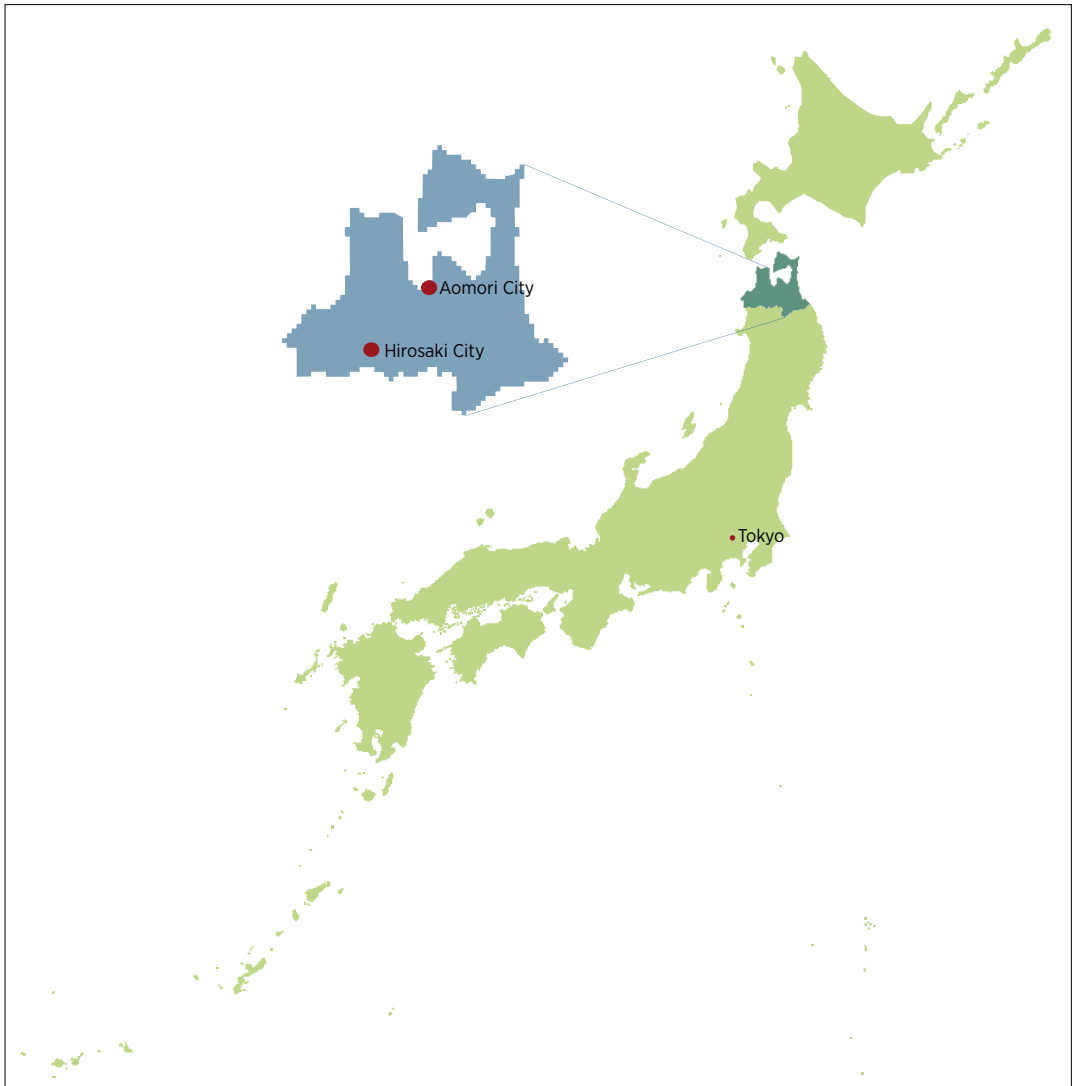


Figure 1. Aomori Prefecture (Teikoku Shoin 2018).

improve the food self-sufficiency ratio of Japan, which has been trending downward since at least the 1960s. In 2014, for instance the calorie supply basis for domestic food industries was 39% and the production value 64%. MAFF has, however, a bold plan to raise the food self-sufficiency ratio to 45% on calorie basis and 73% in production value by 2025. (MAFF 2014.)

Hirosaki University has a Faculty of Agriculture and Life Sciences offering tertiary education to the future employees of food sector companies (Hirosaki University, Faculty of Agriculture and Life Science 2018). Those who graduate from the faculty are employed in food processing companies, farm co-ops or gardening seed companies. The staff of

the faculty also perform collaboration with the local companies to innovate new foods or cultivars. For instance, researchers of the University developed a new kind of apple cultivar for the Aomori Prefecture, which is then sold by a local company (Hirosaki University, Red Fleshed Apple 2018). They have also developed feed for cattle based on the side stream of apple production and a local meat processor sells the beef raised on this special feed. Furthermore, the researchers of Hirosaki University have succeeded in extracting collagen from the cartilage of salmon, which had previously been simply thrown away. The product, named proteoglycan, is sold in cooperation with pharmaceutical product makers and cosmetics makers.

Hirosaki University also has an institute for food science, a research institute that promotes the specialized and interdisciplinary study of food science (Hirosaki University, Institute for Food Sciences 2018). In addition, the Shirakami research center, located in the UNESCO world heritage site of the Shirakami Mountains, develops food with useful microbes. The research institute produces fermented food like bread, pickle, cheese, and yogurt and drinks such as refined sake, wine and cider. (Hirosaki University, Shirakami Research Center for Environmental Sciences 2018.)

2.2 SOUTH OSTROBOTHNIA: THE ROLE OF FOOD INDUSTRIES IN REGIONAL ECONOMY AND THE UNIVERSITY CONSORTIUM OF SEINÄJOKI

The South Ostrobothnia region is part of Western Finland Province. The regional capital, Seinäjoki, with 62 000 inhabitants, is located some 350 kilometers north of the Finnish capital Helsinki. The

region consists of eight towns and nine municipalities and has around 192 000 inhabitants. (The Population of South Ostrobothnia 2017.)

A high number of small businesses and domestic market orientation characterizes the regional economy. This makes the local economy resilient to the fluctuations of the global economy. Investments in research and development are also at a relatively low level though increasing (South Ostrobothnia – Smart & Outstanding Strategy for Smart Specialization 2014, 9–11). South Ostrobothnia is the most primary production- and food processing-oriented of the Finnish regions. As much as 16% of the food industry turnover of Finland is generated by South Ostrobothnian food industries. Agriculture and food industries also form 25% of the regional GDP (Ibid, 17).

From the point of view of the knowledge-based economy, South Ostrobothnia and the Seinäjoki city region can be described as a less-favored region in the Finnish context. The less-favored regions are peripheral by reason of their geographical location or because they lack a university-based research and education system. (Pelkonen & Nieminen 2015.) This means that there is less research activity carried out in the region compared with university cities and there are just a few develop-

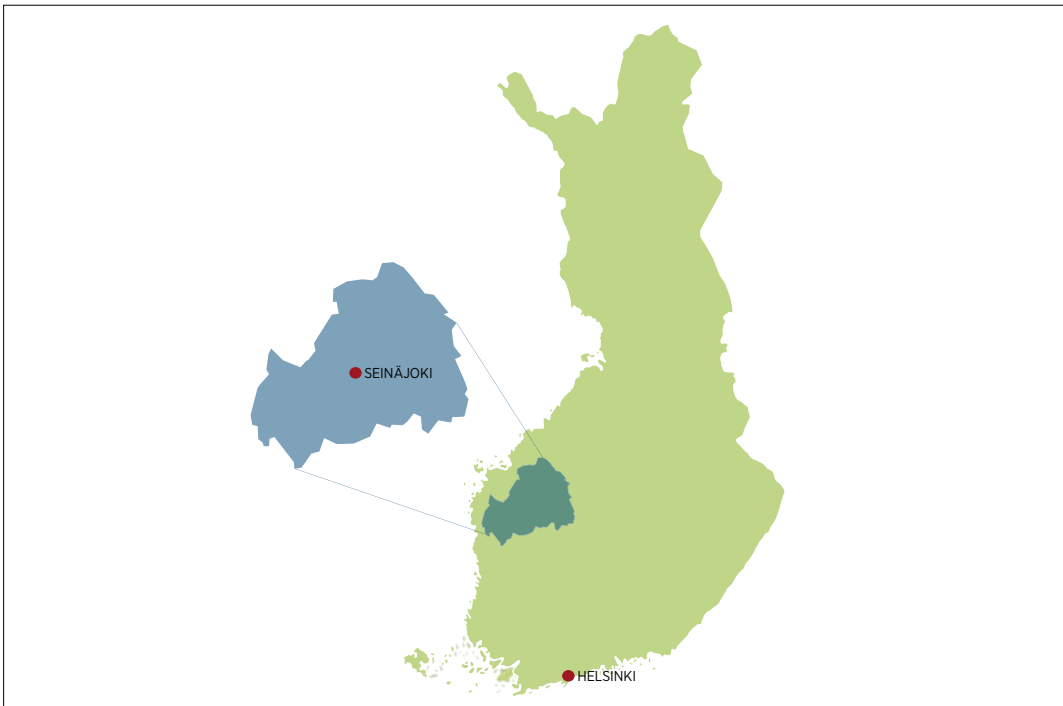


Figure 2. South Ostrobothnia and Seinäjoki.

ment institutions. South Ostrobothnia, however, has skillfully combined the limited resources of the region and found ways to fund regional innovation activities through outside funding and expertise, in which EU programs for regional and social development have been an important tool since Finland joined the European Union in 1995. The region does not have a university of its own, but it has successfully networked with several Finnish universities: the University of Arts, Helsinki, the University of Helsinki, the University of Tampere, the Tampere University of Technology, The University of Turku and the University of Vaasa have branches or affiliates in Seinäjoki. All these Universities (except Turku) belong to the University Consortium of Seinäjoki that is coordinated by the University of Tampere. The Seinäjoki University of Applied Sciences is also an important provider of tertiary education. Its research, development and innovation services are an important asset in supporting the local companies and the regional economy. (South Ostrobothnia – Smart & Outstanding Strategy for Smart Specialization 2014, 12, 24–26.)

The Epanet research network aims to develop the South Ostrobothnia region through research and development by increasing research volume in the region and supporting the competitiveness of regional enterprises by providing them up to date research information. The network was established in 1999 and it is an integral part of the regional innovation system. The concept itself is straightforward. At a regional level, four fields of research have been selected: health and creativity, sustainable food solutions, intelligent and energy-efficient systems, and entrepreneurship and business concepts. Fixed-term research professors are nominated to these fields in cooperation with the Universities of Tampere (the University of Tampere and the Tampere University of Technology), Helsinki (the University of Helsinki and the University of Arts), Vaasa and Turku. The professorships are largely financed by regional actors such as municipalities and companies. By early 2017, the Epanet network had concluded 220 separate contracts with different organizations, of which 70 were companies, and of these 15 were food companies. The Univer-

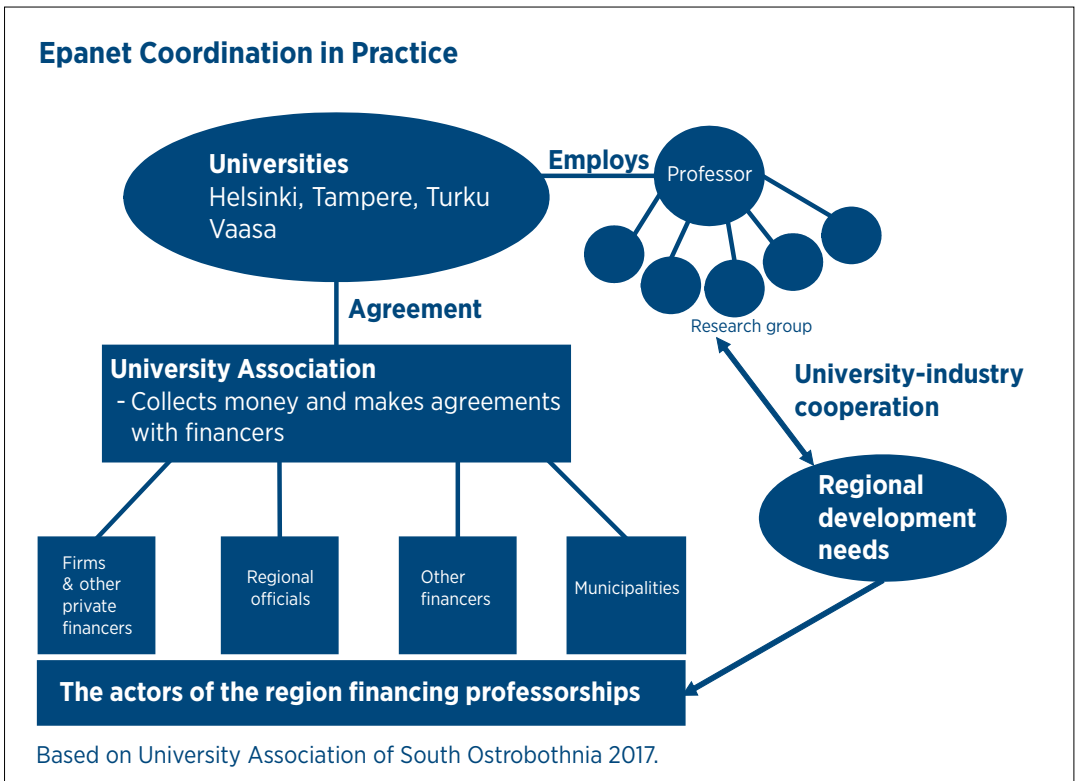


Figure 3. Epanet Coordination in Practice. (Based on the figure “Epanet Coordination in Practice”. Harjunpää & University Association of South Ostrobothnia 2017.)

sity Association is responsible for collecting funds for professorships. After the establishment of a new professorship, the appointed professor creates a research group and starts research and development projects that answer to regional needs. In March 2018, there were 26 professors and responsible researchers in the Epanet network. On average, the research groups led by professors have 3–5 members. Altogether, more than 100 people were employed by the Epanet network in 2018.

In addition to coordinating the financing of professorships, Epanet coordination offers a discussion forum for the researchers and professors of different disciplines. This has led to many interesting and regionally relevant multidisciplinary projects between Epanet research groups.

One of Epanet's strengths lies in its corporate culture and the low threshold of its services. The network has connections to regional and municipal officials and other actors of higher education. The 20–30 companies that actively take part in the network are also an asset. Naturally, there are

also challenges in the functioning of the network. Most notably, the professorships of the network are fixed-term and a lot of time and effort has to be used for fund raising. The Finnish Ministry of Education and Culture has cut the budgets of the Finnish universities recently, which has affected the financing of the professorships. Universities may allocate more administrative costs to professorships than before. University administrations emphasize high-impact international publishing, whereas the research done in South Ostrobothnia is often related more to applied academy-industry cooperation, which is a harder field to publish in highly valued peer-reviewed journals compared with the basic research projects conducted in the departments of university faculties. The lack of indicators for the third mission of the universities and academy-industry cooperation is a handicap that should be addressed within the monitoring systems of the university administration and Finnish Ministries.

3 KEY FINDINGS

3.1 THE OVERALL SITUATION OF FOOD SECTOR COMPANIES IN SOUTH OSTROBOTHNIA AND AOMORI

The overall picture of the food sector industry is that the majority of the food companies in both regions are small companies. In South Ostrobothnia, 100 of the 106 food processing companies (94.3%) have fewer than 50 employees. The situation remains the same at the national level: 98.5% of Finnish food companies have fewer than 200 employees and 95% less than 50. In South Ostrobothnia, the food chain creates 14.5% of the added value of the regional GDP, which is the highest share in the whole of Finland. (Aitojamakuja.fi 2018; Tietohaarukka 2017, 32, 52; Työ- ja elinkeinoministeriö 2016, 23, 26–27.)

Meat and dairy products are the most important food product categories in South Ostrobothnia. Big companies such as the meat house *Atria* and the dairy company *Valio* are important for the regional economy. Smaller companies, however, have an important role as well. According to our interviewees, the region would benefit from a more diversified food industry. In the future, the companies need highly refined products. There is a need for commercializing, branding and positioning. Instead of bulk production, the local companies should have a wide scale of differentiated products that offer more added value and better experiences to the consumers.

Companies in South Ostrobothnia have recently created and produced interesting new products that have gained national attention, such as the broad bean-based meat substitute “*härkis*”. Edible insect farming has also begun in the region. In the dairy industry, the medium-sized company *Juus-toportti* has very advanced products. *Valio* is also producing *Oivariini*, a butter blend in innovative liquid form. Alcohol products made by *Altia* and *Pramia* are also strong brands. In addition, the food business consulting company *Foodwest* operates on the national level. The company offers its food company customers a development platform on which the latest consumer information is combined with state of the art product development. *Foodwest* offers its services in such fields as con-

sumer understanding, product development, commercialization, production, distribution and food product safety. The company has collaborated with major Finnish food companies such as *Atria* and *HKscan*, and with multinational food companies such as *Danone* in addition to smaller regional actors. (Foodwest 2018.)

Although the majority of its food companies are small, South Ostrobothnia has a well-balanced mix of big, medium and small companies in its foodstuff industry. However, some informants described the business structure as being too dominated by the small companies, which have limited interest and ability to learn. They also have limited assets such as time, money and personnel to collaborate with researchers compared with medium-sized ones. The region has a relatively small core group of companies that are very active in academic engagement projects. There is, however, also a greater number of passive companies. How to involve them in the core of cooperation is an important question, as they would probably benefit the most from it.

The most important products of the Aomori region are apples and meat products such as wagyu beef. Aomori prefecture also has the highest production rate of apples, yam, garlic and burdock root in the whole of Japan. The region is also proud of its farming of Tsugaru Roman and Masshigura rice cultivars. The food production in Aomori is based on healthy soil and a secure water cycle, which guarantees the production of safe and reliable food items. (Industries of Aomori Prefecture 2018). The purity of food is an increasingly important topic in Japan, especially after the Fukushima nuclear accident of 2011. Aomori Prefecture supports the regional food industry by promoting direct sales from the producers and the further processing of agricultural produce to increase the added value of the food products. (Industries of Aomori Prefecture 2018)

The great majority of the food companies of the region are small. Nevertheless, there are some bigger companies as well, such as the *First International Corporation*, located in Hachinohe and specialized in exporting Japanese food, especially fruit and vegetables and seafood (First International Corporation 2018). The *Okamura Food company*, which specializes in fish processing, is an im-

portant actor in the region (Okamura Foods 2018). On the regional level, the Hirosaki-based beverage manufacturer *Nikka* is known for its cider.

3.2 THE NATURE OF ACADEMIC ENGAGEMENT IN AOMORI AND SOUTH OSTROBOTHNIA

3.2.1 HOW THE ACADEMIC ENGAGEMENT PROJECTS GET STARTED?

The interviewees recognized several ways of starting cooperation between academia and the food industry in Aomori Prefecture. Earlier, the researchers took the initiative in starting the cooperation, but the situation has changed. Nowadays, the research staff have to react to the needs of the private companies. Hirosaki University has a special unit called The Center for Joint Research (CJR) (known now as the Institute for the Promotion of Research and Innovation) that communicates between the companies and mediates the requests for cooperation from the companies to the researchers. If cooperation is started, companies provide funding and the university provides machines and materials. There is even a special “Go go fund” (since 2017 Grow local fund) that provides funding for a researcher who promises to solve a certain problem for a private company within a year. The sum granted by the university is 5 million yen (around 50 000 euro) and it can be used, for instance, to hire a research assistant.

Companies are also making direct initiatives to researchers. The local government can also act as a third party, mediating between Hirosaki University and the companies. Informal discussions with the companies also play an important part. They might involve unofficial meetings such as “pub seminars” that involve getting together with entrepreneurs and sharing drinks late into the night. One informant described the importance of these get-togethers:

“In day seminars, we just say very official things, very strict things, but in a night seminar we say many things, not official ones, that are very, very important information.”

The unofficial “pub seminars” thus provide opportunities to speak freely without the hindrance of social restrictions. The researchers can thus get interesting tips from the company representatives face to face in a confidential atmosphere.

In South Ostrobothnia, the ways in which cooperation start are similar to Aomori. Anyone

can start the cooperation, but often the initiative comes from the universities, other higher education organizations or researchers. Mediating organizations such as the Epanet research network and regional development officials, such as the Regional Council of South Ostrobothnia, or the municipalities of the region can also play an important part. In addition, the financiers have their say. For instance, the European Regional Development Fund and Tekes (The Finnish Funding Agency for Innovation, known from 2018 onwards as Business Finland) have their own program priorities that set strict preconditions for the realization of academic engagement projects. The entrepreneurs can also take the initiative. The field of research also affects the contact channels used.

The University Association of Seinäjoki supports informal meetings between researchers and the stakeholders of the Ostrobothnian research community through the concept of *Tiedetreffit*, which can be translated as Science Date. The concept is straightforward. Stakeholders such as food company entrepreneurs contact a coordinator who is working in the University Association and state which researcher they would like to meet. They can also contact the researcher directly. The actual Science Date is an informal meeting over lunch or coffee, during which the researcher and his or her date can discuss cooperation opportunities or exchange ideas. The University Association of Seinäjoki covers the costs of the date. (*Tiedetreffit* 2018.)

In general, the interviewees in South Ostrobothnia consider that academy-industry cooperation is easy to arrange with local companies, though some entrepreneurs remain skeptical about its benefits. Epanet professors are cooperating with food chain actors on a broad scope. The forms of the academic engagement projects among the professors of Epanet research network vary from product, service and marketing development to logistics, production, food hygiene and biosafety development. The interviewees, familiar with several industries, did not see any fundamental differences in cooperating with the food industry compared with other industries.

The most important partner companies are usually small- or medium-sized concerns such as *Pirjon Pakari* Bakery or *Juustoportti* dairy company, which are both medium-sized. The interviewees considered bakeries and HoReCa (Hotel/Restaurant/Catering) sector companies as well convenience food companies to be important, whereas companies that are big on a Finnish scale, such as *Atria* and *Valio*, tend to be more self-sufficient in their doings and cooperation with them is less frequent. Nevertheless, for one interviewee, the big

companies such as *Atria* and the biggest bakeries of Finland – *Vaasan* and *Fazer* – were among the most important partners. The retail store chains *S-Group* and *Minimani* were also considered important. Some cooperation was also conducted at the farm level in the fields of milk hygiene and animal biosafety.

A professor who had been working for 15 years in the region gave this description of the development and current situation of food sector companies in South Ostrobothnia:

“Generally speaking, the situation is very good. I dare to speak about historical perspective as I have been here for almost 15 years. We have made considerable progress. Naturally, it is possible to do things even better, but that is always the case. Nowadays, the people of the region believe in their own work and the development orientation has increased. The atmosphere and the attitude emphasize constant improvement. The local companies have realized that it is okay to ask others for help. In addition, the role of education, development and research work are seen in a different light than during my early years here. We have good companies, good cases, and a lot of positive buzz. Naturally, there must be sad stories as well, but things have progressed very well. There could be greater growth orientation though.”

The situation in South Ostrobothnia thus seems very positive. Food companies are more development-oriented than before and the entrepreneurs’ attitudes towards research have improved significantly. However, the transfer of knowledge between researchers and companies could be more efficient. This would lead to a closer dialogue that could increase the companies’ knowledge of their own products and their field of business even more.

3.2.2 FORMS OF ACADEMY-INDUSTRY COOPERATION

In both regions, the triple-helix model in which universities, public officials and companies cooperate is the norm for academic engagement projects. In both regions, the quadruple-helix model, in which the end-users are involved in the cooperation process, is also used to some extent.

Both basic and applied research are conducted in Aomori and South Ostrobothnia as part of academic engagement projects. The nature of the research, nevertheless, depends on the research field. For instance, marketing, developing milk replace-

ments for calves, or food hygiene and engineering are applied fields by nature, so the professors of these fields do a lot of applied research. Getting funding for the applied research might also be easier. Basic research, however, is not being neglected. According to the informants in South Ostrobothnia, basic research is the core of applied research and they support each other. The professors from Hirosaki University also strongly emphasized the meaning of applied sciences in the academic engagement, and the food sector companies shared this view. According to them, however, basic research, is needed to create the base for successful applied research. To support both basic and applied research Hirosaki University Institute for Food Sciences has two laboratories: a donation laboratory that has been used for applied research with companies, and a laboratory for basic research. In this dual model, a PhD student can choose whether his dissertation emphasizes applied or basic research. The opportunity to do a dissertation focusing on applied research has also led to the establishment of many new firms in Japan.

The researchers of Hirosaki University focused on product development and process development projects with food companies, as well as market research. Naturally, the nature of cooperation depends on the field. In 2015, academic engagement projects involved, for instance, the refining of the residue of cider production into animal feed and the development project of a milk replacement. There was also an ongoing educational project for citizens about how food and animal feed are produced. This project was meant to promote local food to customers. Some Hirosaki University researchers were also performing research on nutrigenomics in a donation laboratory funded by Japanese companies.

As the production of apples and apple products is an important part of the food industries of Aomori, the Hirosaki University Center for Joint Research, the Faculty of Agriculture and Science and their research apple farm, together with the intellectual rights office of the University, have created a joint regional Apple Committee to support the apple supply chain. The cities of Hirakawa and Fujisaki and the town of Itayanagi are also part of this Committee. The Hirosaki University Faculty of Humanities and Social Sciences is also part of it. Their researchers have conducted marketing research for special apple products and supported the creation of marketing strategies for the products. In addition, Hirosaki University’s Institute for Food Science is participating in the activities of the committee and the Faculty of Education has been interested in how to educate consumers on the nutritional value of apples. There are also four region-

al companies, which are the private sector partners within the organization.

One of the companies is the *Apple Factory* that is responsible for selling the young plants. Another company processes the apples into fresh slices that are sold in vending machines. A third company is the brewery *Nikka*, which makes apple cider. There is also a logistics company that transports and stores apples. The local municipalities own the companies involved in the committee. Local farmers from the municipalities of Aomori Prefecture are also members of the committee. Municipalities also provide funding to keep up the research and development activities of the research apple farm. The Ministry of Agriculture and the Ministry of Education and Science also fund the farm. Since 2015, the University of Hirosaki has received 30 million yen per year (around 230 000 euro at 03/2018 rates) to keep up the farm. Of this sum, 20 million came from the Ministry of Education and Science, and one million from Hirosaki University. The Japanese Ministry of Agriculture is also a member and a financier of the committee. Earlier, a private company contributed some 1.2 million yen (around 9100 euro at 03/2018 rates) per year to the research farm. The researchers and other members of the Committee also help the farmers to overcome their problems in apple production. The Apple Committee is thus helping in the “revitalization of the local economy”, which is a nationwide regional development policy initiative to support non-metropolitan regions.

Researchers in South Ostrobothnia are mostly focused on the development of products and services and transferring the latest academic information and know-how to local companies. They also perform market research and help with production development. The projects are mostly publicly financed, but private enterprises are often needed to provide co-financing. Food company representatives are also members of the steering groups of the regionally-funded Epanet professorships. Master’s students working in the research groups of the professors can also write their thesis while working for the companies.

Unlike Aomori Prefecture with its Apple Committee, South Ostrobothnia lacks a more permanent organization to support a certain branch of the local food industries. There are, however, project organizations like the Agrobioeconomy Seinäjoki innovation community, which consists of the Seinäjoki University of Applied Sciences, Natural Resources Finland, the University Consortium of Seinäjoki, the University of Helsinki, Ruralia Institute and Into Seinäjoki Business Development that

are jointly looking ways to improve the local innovation environment for agrobioeconomy and to support local food industry in this process. In addition, a number of local companies, public and third sector actors have participated in the activities of the community. (Sivula, Sutari, Jumppanen & Ahvenniemi 2016, AB Seinäjoki 2018.)

3.2.3 THE ROLE OF ACADEMIC ENGAGEMENT PROJECTS IN GAINING ACADEMIC MERIT

The professors of Hirosaki University were skeptical about the role of academic engagement as a way of gaining academic merit. According to one interviewee, the third mission has little prospect of furthering one’s academic career compared with research or teaching, and that is why majority of the researchers are not interested in it. Nevertheless, the Japanese Ministry of Education, Culture, Sports, Science and Technology is financing “local revitalization” or “local promotion” programs that are important, as “community is the new role of the university”. Academic engagement is thus becoming a more important issue in Japan. Traditionally, patents have been the most important indicator for academic engagement, but things are changing. New indicators include the number of people hired by companies in joint projects.

In Finland in general, the situation is similar. Peer-reviewed publications are very important indicators for the financing of the universities. Year by year, more peer-reviewed international publishing is being demanded from the professors of the Epanet Network as well. At the same time, the academic engagement does not help in promoting your career. Nevertheless, it can be valued in the international evaluations done in Finnish universities, but this respect does not necessarily materialize in the daily lives of individual professors.

Nevertheless, Finnish universities also want greater cooperation with companies. The recent economic downturn, which started 2007–2008, has led to a cutting of the public financing of research in Finland. It was hoped that industries would take more responsibility for the funding of research activities, but they have not. Finland, however, is not alone having these problems, as similar situations have arisen in other Nordic Countries such as Denmark. On the other hand, in some research fields, such as business administration, academic engagement with companies plays a primary role and offers good opportunities for peer-reviewed publishing, as the research is closely associated with the work of the companies.

In a case of one professor in the field, private enterprises, municipalities and other regional actors also played an important role as financiers whose support enabled the economic freedom to focus on research and publishing instead of teaching:

“My home university has a very positive attitude towards academic engagement. It was quite exciting to notice that, even though the university has become the biggest financier of my new professorship period, contributes nearly one third of its financing and there has been some pressure to increase my teaching duties. I do not know all the details, but without good financing from the region, they would have given me more teaching duties, nevertheless as my external financing is very exhaustive I can continue as before [as a research professor]”.

Overall, in both study regions peer-reviewed academic publications were considered the ultimate yardstick of academic merit. In both regions, researchers shared the opinion that writing peer-reviewed academic publications while conducting applied research projects with companies is demanding.

In the case of Hirosaki University, non-disclosure was a big hindrance. Research results from cooperation with companies often have to be concealed, as companies are more interested in patented products than the open publishing of the results. According to one interviewee, commercially feasible projects rarely further an academic career. However, they provide funding for the faculty, which is always welcome. One professor from Hirosaki University even suggested that it is better to keep applied academic engagement projects and basic research entirely separate from each other, as the logic is so different. Companies want results quickly, but basic research takes a lot of time.

The interviewees in South Ostrobothnia, also considered academic publishing in applied research projects demanding. One Professor, however, stated that it is possible to do academic research within the short timeframe of the companies, but it means that the researchers must be ready to provide practical development ideas for the entrepreneurs periodically during the research process. Focusing entirely on academic publishing is, however, difficult as business people are eager to get some mid-term results and are not necessarily able to take full advantage of the peer-reviewed articles because of lack of time and other constraints. Altogether, these factors mean that it is much more

demanding and time-consuming to publish during an academic engagement project than in a basic research project.

In Finland, the funding of the universities is tied to academic accomplishments such as the publication of peer-reviewed articles. Practice-oriented reports and other non-peer reviewed publications written in applied research projects are not highly esteemed. The Finnish Ministry of Education and Culture gives ten or even forty times more publishing points from academic peer-reviewed articles than from practically-oriented non-peer reviewed development reports. As the points have a great impact on the financing of the universities, and to the assessment of scholars' academic merit, the system effectively steers the publishing efforts of the Finnish universities towards peer-reviewed international journals. Most of the financiers of the Epanet professorships, however, emphasize the role of applied research and production of regionally relevant information. The professors of the network thus have to take into consideration both the demands of their home university and the interests of regional stakeholders. Balancing between these two factors was described as challenging but some professors of the network are skillful in answering to both demands.

According to one Hirosaki University professor, applied research in general is as highly valued in Japan as basic research, whereas Western countries are shortsighted in their research policies and over-emphasis on basic research at the expense of applied research:

“Usually pure scientists look down on applied scientists, but the Japanese situation is not so. Most of the Japanese winners of the Nobel prize come from the field of applied sciences. So in Japan, the status of applied research is not so low in comparison with other countries. - - Western countries invest huge amounts of money in pure science; the Japanese government has invested in applied science. You should not compare applied and pure science.”

It would be tempting to follow this criticism of western research policy without hesitation in the Finnish context, but it seems that the Japanese research world also has some problems in this regard. In fact, another professor from Hirosaki University stated that academic engagement is not good for academic careers and supposes that 9 out of 10 professors are not interested in it for this reason. Those of the Finnish professors interviewed who were doing research in an applied field did

not mention any experiences of being undermined within the research community either. Nevertheless, it seems that in both countries the primary role of the universities is still to provide the society with the highest level of basic research and education, and academic engagement comes in third.

The professors of the Epanet Research network had developed different strategies in producing peer-reviewed publications during academia-industry projects with food companies. One interviewee emphasized the role of careful pre-planning, which makes it possible to have separate development and writing periods. For instance, PhD students can first focus on the practical side of a development project and then write about it. Another strategy is to use the help of seasoned research group members who can share the workload with the professor and publish together:

“There are big differences [in the publishing performance] of research groups. The success depends entirely on the composition of the research group. If you can gather a [good] group around you, everything is possible, but if you try to do everything by yourself, it just does not work. When you are alone you cannot do applied research and publish, but if you have a good group around you, you can do both together.”

Sometimes the only way to combine both academic and commercial interests within a project demands committing spare time such as evenings and weekends to writing publications. An applied academic engagement project can also support the basic research initiatives of the researchers by sparking ideas and keeping the basic research more concrete, as the questions covered are practice-oriented.

3.2.4 THE SOURCES OF FUNDING

Academic engagement with food companies both within Hirosaki University and the Epanet research network relies heavily on public funding. Private funding is, however, an important supplement. The most important financers at Hirosaki University are government ministries, especially those of Agriculture, Industry and Trade. Nevertheless, funding provided by companies plays a significant part. The Hirosaki University Institute for Food Science, for instance, gets 50% of its financing from the companies, 40% from the national government, 5% from the university and 5% from local government. PhD students from big companies

are also one source of revenue, as a single student brings around 4300 euro per year to the University.

In South Ostrobothnia, important sources of public funding for applied research include Tekes, which provides government money for applied research. The Finnish Academy is an important state financer of basic research. Funding is also acquired from the regional Centre for Economic Development, Transport and the Environment, a regional representative of the Ministry of Employment and the Economy. The European Union's programs for regional development, administered by regional actors such as the Regional Council of South Ostrobothnia, play an important part, as do the EU's interregional development programs. The home universities of the Epanet Professors are also important financers of the regional professorships. Getting public funding for academic engagement projects, however, often requires recommendation or co-financing from companies as well. For instance, during the application process of one recent milk hygiene project, dairy farmers evaluated whether the project was worth funding or not. The public officials made the decision based largely on this statement. Private sector actors can thus have a notable influence on the financial decision-making of the public authorities in Finland.

3.3 THE CHALLENGES OF ACADEMY-INDUSTRY COOPERATION WITHIN FOOD SECTOR

Many of the professors of Hirosaki University and the Epanet research network described how lack of time and the different logics of business and academic research were typical challenges for academic engagement. Companies want results quickly and keep them secret, whereas the academics ponder deeply before publishing their research results. These challenges are not, however, as great as they seem. According to one professor from Hirosaki University, generally research interests and corporate interests are easy to combine. Another interviewee from the Epanet network shared this idea:

“There is no conflict such that companies are only interested in making profit and researchers in publishing in highly valued international journals. When we have a project funded by Tekes, we do exactly as agreed with the company. As researchers, we must preplan the project such that we can separate the scientific

cally interesting part from the data collected. Then later, we can frame it with a theoretical framework and reasoning.”

One Epanet scholar also stated that by including concrete elements in the joint project, it is possible to keep up the interests of entrepreneurs for the duration of the whole cooperation project. Hirosaki University also offers economic support to help with the lack of time. In the case of an academic engagement project that receives more than 10 million yen of external finances (approx. 77 000 euro at 03/2018 rate), it is possible to get a project secretary from the university to help with administrative duties and thus ease the workload. Issues connected with non-disclosure of the research results are more difficult to overcome. According to one interviewee, the best way is to do the basic research first and then patent your results and publish them. This process might take 5 years, but after that, you can start cooperating with companies in applied research projects and most likely be able to produce something commercially valuable within 3 years, which is an acceptable timeframe for the companies. Thus the problems connected with non-disclosure of research results can be avoided to a large extent. Separating the cooperation into basic research and applied research phases also gives the scholar an opportunity for economic gain; whereas any attempt to get rich by doing basic research is a “beautiful dream” that is doomed to fail:

“...I fear that pure science, very good pure science and making money is different. The purity [of science] is very important. Sometimes the young researchers have the misunderstanding that the dream is to make money, but no.”

“...Today’s conclusion is that if you run after two hares, you will catch neither. So money or happiness, whichever you prefer... To separate beauty and genuineness is very important; you cannot have it both ways.”

Scholars from South Ostrobothnia also mentioned other challenges. One was that company representatives do not always understand that researchers are not consultants and must remain neutral. They cannot, for instance, market the products of a single company or write a business plan for it as the rules of publicly financed projects forbid the benefitting of just one company. Sometimes it is also a challenge to communicate the research results such that the entrepreneurs understand their

meaning for their own work. In certain sectors of food industries, research can be carried out only during production times and breaks. This, however, is more of a fact than a problem as such, according to one interviewee. Trust building is very important, but time-consuming. Companies can be very secretive, as they do not want to reveal their competitive edge to their competitors. This occasionally makes their participation in public development projects difficult. It was also emphasized that cooperation with food companies is multidisciplinary by nature, which can be a challenge as it means that the researchers have to know the basics of other fields such as nutrition, food safety or engineering. However, this can also be an enriching element of academic work.

3.3.1 DOES SIZE MATTER? ACADEMIC ENGAGEMENT WITH BIG AND SMALL COMPANIES

Company size is one factor that affects academic engagement profoundly in both regions. In Aomori Prefecture, the assets of the big companies are their personnel and knowhow. They have their own research staff to perform cooperation with researchers, which makes interaction relatively easy. Big companies can also be important funders in joint projects and other activities. They also usually have ambitious growth plans, which makes it possible to organize interesting joint projects. On the other hand, big companies can be slow and bureaucratic, and have strong non-disclosure policies, whereas small companies are fast and agile. The small companies, however, suffer from limited resources and have only a little interest in expanding their business. This reduces the opportunities to carry out innovative research projects with them.

According to one South Ostrobothnian interviewee the level of knowledge in small companies is much lower than in medium-sized or big companies. Small companies might lack the basic knowledge of the markets they operate in and they do not necessarily even know their target groups. In small companies, owners also often have unrealistic expectations for the cooperation. They see the professor as a consultant who would help to solve the company’s practical problems quickly. The managers of the bigger companies have a good overview of the general market situation. They know what they need and their staff are familiar with the possibilities and limitations of the information created in academic research. Despite the limitation of small companies, another South Ostrobothnian interviewee preferred collaborating with them over the

bigger ones. According to this informant, big companies have their own R&D departments and are not interested in academic engagement. Therefore, this professor does not do any significant cooperation with them, but some PhD students from big companies work under the professor's guidance.

A couple of the interviewees from South Ostrobothnia, however, did not have a preference regarding company size. They saw the speed and agility of the small companies as their main assets. For instance, an ambitious and development-oriented owner can make favorable decisions quickly.

"You cannot say that SMEs are not able to perform cooperation; it depends on the firm and its economic situation. Small companies can offer possibilities for academic engagement... In SMEs it is largely the interests of the owner and his interest in new things that makes development possible."

The downside in interacting with micro enterprises in particular is their lack of resources, personnel, time and money:

"Big companies have much better resources for participating in a development project. A big company does not stop because the owner participates in some joint event. When interacting with very small companies you have to take into consideration that all the work in the company can stop because of a development project meeting... Even if the entrepreneur would be willing to participate in activities of all kind, it might be very difficult to realize them."

One interviewee from South Ostrobothnia described an ideal food company for cooperation as having 20–50 personnel and development capabilities of its own and a growth orientation. It would be run by an owner-manager to keep the decision-making fast. However, the variation between the answers of the interviewees in both regions seems to underline that there is no clear optimum size of food company for cooperation, but this varies case by case.

3.3.2 EVALUATING THE EXPERIENCES OF ACADEMIC ENGAGEMENT

The results and outcomes of the university researchers' cooperation with food companies are evaluated on a yearly basis at Hirosaki University. Professors report their grant applications, including those that involve company participation, to the central administration of the University. Getting external funding from companies or other sources is an important positive factor in the personal evaluation of a researcher.

In Finland, both academic and regional development achievements are evaluated. The professors of the Epanet research network are also encouraged to find external sources of funding, including food companies. The research network and the home university of the researcher evaluate the results of the academy- industry cooperation. The administrative staff of the Epanet network considers the number of partnerships and the amount of external funding of the professorship.

Academic engagement with companies was highly valued by some of the home universities and faculties of the Finnish interviewees. How it is evaluated is a more difficult question. The number of business contacts can be counted, for instance, but it is much harder to evaluate the quality of the cooperation. University administration in Finland lacks clear indicators for evaluation. On the other hand, companies give feedback regarding successes and failures, as they have their own interests at stake. Researchers are also active in asking for feedback from food companies.

The evaluation criteria of the financing public authorities are also usually straightforward and quantifiable, such as the number of companies participating in the project or the number of participants in project events. According to one professor, quantitative indicators are not usually enough for the comprehensive evaluation of the cooperation project, but qualitative data needs to be collected as well. Fortunately, it is usually easy to get feedback from the entrepreneurs and it is always possible to use one's own reflections about the successes and failures of the project and report these findings to the financiers along with the quantified monitoring data.

4 CONCLUSIONS

The food industries of Aomori Prefecture and South Ostrobothnia are SME dominated, but a few big companies are the most important single actors in the regional economy. The apple, vegetable, seafood and meat sectors are the most important in Aomori Prefecture, and meat and dairy in South Ostrobothnia.

The methods by which the regions started academic engagement with companies shared many similarities, but there were also notable differences. The professors of Hirosaki University had earlier taken the main initiative in starting collaboration with food sector companies, but the situation changed after the establishment of the Center for Joint Research (CJR) within the university, which now coordinates academic engagement initiatives between researchers and companies. The establishment of this organization has meant that today most of the initiatives come from the entrepreneurs to CJR, which then sends them on to professors. In the Epanet Network, it is still the individual researchers or their background organizations that usually take the initiative. Nevertheless, even in Hirosaki direct contacts between researchers and entrepreneurs are still important and the informal after-office hours meetings (“pub seminars”) are an important forum for exchanging ideas. In South Ostrobothnia, the University Association of South Ostrobothnia supports informal meetings of scholars and entrepreneurs by creating supportive tools for this purpose, such as the Science Date. In both regions, the regional officials also play their part in mediating the cooperation initiatives. In the case of South Ostrobothnia, the public financing programs of national and EU origin also set guidelines for cooperation.

It seems that Hirosaki University has a more systematic approach supporting the starting of academic engagement, whereas the actors of the Epanet network rely more on personal relations. Nevertheless, the regions are very different in terms of population as the Aomori Prefecture has 1.35 million residents and South Ostrobothnia 0.192 million. Thus, without making any deeper analysis, we can say that both regions have created the tools that fit their regional context best. A more institutionalized form fits the more numerous academic engagement needs of Aomori Prefecture

whereas in South Ostrobothnia, where “everybody knows each other”, the demand for academic engagement is more limited and the scholars can rely more on personal relationships.

The nature of academy-industry cooperation is based on applied research projects that use the triple-helix and quadruple-helix models. In both regions, individual researchers collaborate with companies in such fields as product and service development and market research. In Hirosaki University, the academic engagement is also organized through more institutionalized forms of interaction, such as the regional Apple Committee that brings together companies, apple producers, regional and local officials and researchers to create new products and business opportunities within the apple cluster together. The Hirosaki University Institute for Food Sciences also has a donation laboratory, where the production of practice-oriented dissertations is possible. This type of strategically focused innovation community is missing in South Ostrobothnia, although there are project-based temporary organizations such as AB Seinäjoki to help the overall development of the agrobioeconomy sector of the region, including the food sector.

In both regions, academic engagement projects as such have a limited role in gaining academic merit. Publishing in peer-reviewed journals is the most important indicator for advancing an academic career. In Japan, however, the Ministry of Education, Culture, Sports, Science and Technology has started to provide funding to fulfill the third mission, whereas in Finland this type of funding is non-existent on the national scale.

The financing of academic engagement projects with food companies comes mostly from public sources. The role of private funding is, however, also important. The Hirosaki University Institute for Food Sciences, for instance, gets 50% of its funding from companies. South Ostrobothnian companies also co-finance the majority of the regional Epanet professorships. Nevertheless, the role of public funding seems more important in South Ostrobothnia than in Aomori Prefecture. The European Union’s regional development funding and Tekes (Business Finland) are among the key financiers. The municipalities are also important financiers in both regions.

Researchers faced similar problems in conducting academic engagement projects. Researchers from both regions named the lack of time and the different logics of business and academic research as typical challenges. The actors of the regions however, had come up with solutions to these problems, such as providing economic support to hire research secretaries in Hirosaki to spare the time of the researchers, and including concrete development elements by the Epanet researcher at every stage of the joint project with companies. Careful preplanning and staging of the research and development activities into separate entities bought time for the publishing of results among Epanet professors. Hirosaki University researchers also used staging in overcoming non-disclosure issues.

In both regions, company size affected the methods and likelihood of successful cooperation. Big companies in both regions have good resources such as their own R&D staff, generous budgets and better understanding about the market situation and the limitations and possibilities of the academic research, compared with SMEs. On the other hand, small companies are more agile and have more open disclosure policies. To sum up the ideas of the interviewees, it can be said that there is no

universal optimum size for food sector company to cooperate with, but the content and the goals of the joint project define this on a case by a case basis.

The outcomes of academic engagement were evaluated on an annual basis on both regions. Hirosaki University emphasized the amount of external funding, the number of companies participating in the joint projects, the number of patents generated as well as some more indirect indicators such as the employment effects of a project. The evaluation criteria for the academic engagement performance of the Epanet professors were more varied due to the greater number of background organizations involved in the evaluation processes and the lack of clear national indicators for the third mission of the universities. Nevertheless, Epanet professors were encouraged to find external sources of funding and to create new partnerships with food companies, as the purpose of the Epanet research network is to support the regional development of South Ostrobothnia. Feedback from the entrepreneurs was considered very important for the self-evaluation of the joint projects, whereas the evaluation criteria set by public funders were seen to focus too heavily on quantified measures instead of the quality of the actual academic engagement activities.

5 RECOMMENDATIONS

Aomori Prefecture and South Ostrobothnia are quite dissimilar regions by many indicators. This affects the arranging of the academic engagement activities with food sector companies. Some issues of academic engagement, however, seem to offer possibilities for mutual learning. Regional officials and higher education actors in South Ostrobothnia could learn from the long-term planning and organization of their Aomori colleagues. Organizations such as the Hirosaki University Institute for Food Science and the Regional Apple Committee are good examples of highly organized long-lasting academic engagement initiatives to support the regional food industries. They are based on long-term strategic thinking to develop the regional innovation capability of the food sector. South Ostrobothnia should also make such bold moves, as the role of the food sector is central in the regional economy. Currently there are too many overlapping and short-term projects, which seldom lead to long-lasting outcomes. Nevertheless, actors in South Ostrobothnia have created such success stories as Foodwest Ltd., which was established with

joint regional resources in 1995, and which today operates on a national basis by providing product development and consumer research services for food companies. New initiatives such as Food Heureka (Ruokaheureka in Finnish), a center to promote the food industries and traditional wood-working skills of the region for travelers, investors and citizens and act as a hub for the regional development of these fields, would be one step forward.

The Finnish officials representing higher education and science in the Ministry of Education and Culture should also take a close look at how their Japanese counterparts have organized the evaluation of the third mission of the universities on the national level, as Finland today does not have any clear indicators for the third mission and evaluation is practically non-existent.

The actors of Hirosaki University could learn from South Ostrobothnia about the initiatives to support informal interaction between researchers and entrepreneurs, such as the Science Date concept.

REFERENCES

- AB Seinäjoki (2018). The web pages of Agrobioeconomy Seinäjoki innovation community. Accessed on 15 February 2018 at <http://www.abseinajoki.com/>.
- Aitojamakuja.fi (2018). University of Turku maintained web page that provides Finnish food company and local-food sector information. University of Turku. Accessed on 23 March 2018 at <http://www.aitojamakuja.fi/index.php?lang=fin>.
- Aomori City (2018). The homepage of the city of Aomori. Accessed on 13 April 2018 at <https://www.city.aomori.aomori.jp/shimin/shiseijouhou/aomorishi-konnamati/toukei/jinkouseitaisuu.html>.
- Aomori Prefectural Government (2018). The web pages of the Aomori Prefectural Government. Accessed on 12 April 2018 at http://www.pref.aomori.lg.jp/k-kensei/sangyo_agri.html.
- Aomori Prefecture – Industries of Aomori Prefecture (2018). Accessed on 23 May 2018 at https://www.pref.aomori.lg.jp/foreigners/english_industries.html.
- Aomori Prefecture – Introduction (2017). The hub of exchange & Cooperation. The Association of North East Asia Regional Governments. Accessed on 15 December 2017 at http://www.neargov.org/en/page.jsp?mnu_uid=2895.
- Finnish Ministry of Economic Affairs and Employment (2016). Yearly report on Food industry. Accessed on 22 March 2018 at https://selryfi-bin.directo.fi/@Bin/e789a46c776bd30c9b77f37776e6e81c/1521707609/application/pdf/61525896/toimialaraportti_Elintarviketeollisuus_2016.pdf.
- First International Corporation (2018). Company home page. Accessed on 23 May 2018 at <http://www.firstintl.co.jp/en/index.html>.
- Food works – Gastronomy workshop as a tool for innovation (2015). Seinäjoki University of Applied Sciences. Accessed on 19 September 2017 at https://storage.googleapis.com/seamk-production/2017/06/foodworks_2015_2017.pdf.
- Foodwest (2018). Foodwest homepage. Accessed on 21 March 2018 at <https://www.foodwest.fi/en/>.
- The Forestry Agency (2012). *Forest rate and artificial plantation rate divided into administrative divisions*. Accessed on 15 March 2018 at <http://www.rinya.maff.go.jp/j/keikaku/genkyou/h24/1.html>.
- Hachinohe City (2018). The homepage of Hachinohe City. Accessed on 13 April 2018 at <http://www.city.hachinohe.aomori.jp/index.cfm/8,94931,15.html>.
- Harjunpää, Nina (2017). University Association of South Ostrobothnia, Research Network Epanet & University Consortium of Seinäjoki. The University Association of South Ostrobothnia. Accessed on 23 May 2018 at: https://epky-my.sharepoint.com/personal/nina_harjunpaa_epky_fi/Documents/NINA/Epky%20-%20www/2017/Epanet_in_English.pdf?slrid=d6df699e-50b1-5000-8390-5daae3e6b341.
- Hirosaki City (2018). The homepage of the Hirosaki City. Accessed on 13 April, 2018 at <https://www.opendata-hirosaki.jp/>.
- Hirosaki University, Faculty of Agriculture and Life Science (2018). Accessed on 22 May 2018 at <http://nature.cc.hirosaki-u.ac.jp/english/>.
- Hirosaki University, Institute for Food Sciences (2018). Accessed on 22 May 2018 at <http://www.ifs.hirosaki-u.ac.jp/en-overview>.
- Hirosaki University, Red Fleshed Apple (2018). Accessed on 22 May 2018 at <http://nature.cc.hirosaki-u.ac.jp/kurenainoyume/english.html>.
- Hirosaki University, Shirakami Research Center for Environmental Sciences (2018). Accessed on 22 May 2018 at <http://www.hirosaki-u.ac.jp/shirakami/english/>.
- Hsieh, Hsiu-Fang and Shannon, Sarah E. (2005). “Three Approaches to Qualitative Content Analysis”. *Qualitative Health Research*, Vol. 15 No. 9, 1277–1288.
- Japanese Ministry of Agriculture, Forestry and Fisheries (2018). Accessed on 13 April 2018 at http://www.maff.go.jp/j/shokusan/renkei/6jika/pdf/pdf/2802_6jika_jirei_all.pdf.
- Industries of Aomori Prefecture (2017). Aomori Prefectural Government. Accessed on 15 December 2017 at <http://www.pref.aomori.lg.jp/foreigners/index.html>.
- Laredo, Philippe (2007). “Revisiting the Third Mission of Universities: Toward a Renewed Cat-

- egorization of University Activities”. *Higher Education Policy*. Vol. 20, pp.441–456.
- Lester, Richard K. (2007). “Universities, Innovation and the Competitiveness of Local Economies: An Overview”. In *Innovation, Universities, and the Competitiveness of Regions*. Edited by Richard K. Lester and Markku Sotarauta. *Technology Review* 214/2007, 9-30. Tekes – the Finnish Funding for innovation. Accessed on 15 December 2017 at <https://www.tekes.fi/globalassets/julkaisut/universities.pdf>.
- Lester, Richard K. & Sotarauta, Markku (2007). ”Executive Summary”. In *Innovation, Universities, and the Competitiveness of Regions*. Edited by Richard K. Lester and Markku Sotarauta. *Technology Review* 214/2007, 1-3. Tekes – the Finnish Funding for innovation. Accessed on 15 December 2017 at <https://www.tekes.fi/globalassets/julkaisut/universities.pdf>.
- Ministry of Agriculture, Forestry and Fisheries (2014). *Close to Your Daily Life*. Vision Statement of the Japanese Ministry of Agriculture, Forestry and Fisheries. Accessed on 15 March 2018 at http://www.maff.go.jp/e/pdf/maff_e_all_1215.pdf.
- Ministry of Agriculture, Forestry and Fisheries (2017a). *Fruit tree production shipment statistics*. Accessed on 15 March 2018 at http://www.maff.go.jp/j/tokei/kouhyou/sakumotu/sakkyou_kazyu/index.html.
- Ministry of Agriculture, Forestry and Fisheries (2017b). *Sea surface fishery production statistics investigation*. Accessed on 15 March 2018 at http://www.maff.go.jp/j/tokei/kouhyou/kaimen_gyosei/.
- Ministry of Agriculture Forestry and Fisheries (2017c). *Vegetables production shipment statistics*. Accessed on 15 March 2018 at http://www.maff.go.jp/j/tokei/kouhyou/sakumotu/sakkyou_yasai/index.html.
- Nakano, Ken (2014). “The “Sixth Industrialization” for Japanese Agricultural Development”. *The Ritsumeikan Economic Review*. Vol. LXIII No. 3-4. pp. 60–72.
- Okamura Foods (2018.) Homepage. Accessed on 23 May 2018 at <http://okamurashokuhin.co.jp/en/company.html>.
- Pelkonen, Antti & Nieminen, Mika (2015). “How Beneficial is a Knowledge-based Development Strategy for Peripheral Regions? A Case Study”. *European Planning Studies*, Vol. 24:2, pp.364–386.
- Perkmann, Markus; Tartari, Valentina; McKelvey, Maureen; Autio, Erkki; Broström, Anders; D’Este, Pablo; Fini, Riccardo; Geuna, Aldo; Grimaldi, Rosa; Hughes, Alan; Krabel, Stefan; Kitson, Michael; Llerena, Patrick; Lissoni, Francesco; Salter, Ammon & Sobrero, Maurizio. (2013). Academic engagement and commercialization: A review of the literature on university-industry relations. *Research Policy*. Vol. 42, pp.423–442.
- The Population of South Ostrobothnia (2017). “Väkiluku”. The Regional Council of South Ostrobothnia, Seinäjoki. Accessed on 15 December 2017 at <http://www.eplitto.fi/vakiluku>.
- Sivula, Ari; Suutari, Timo; Jumppanen, Aapo & Ahvenniemi, Maria (2016). AB Seinäjoki: Kohti agrobiotalouden innovaatioyhteisöä. (AB Seinäjoki: Towards Innovation Center of Agrobioeconomy.) In: Seinäjoen ammattikorkeakoulun julkaisusarja B. Raportteja ja selvityksiä 116, Seinäjoen ammattikorkeakoulu.
- South Ostrobothnia – *Smart & Outstanding Strategy for Smart Specialization* (2014). Regional Council of South Ostrobothnia, Seinäjoki. Accessed on 15 December 2017 at http://www.eplitto.fi/images/B_64_South_Ostrobothnia_Smart_and_Outstanding_Strategy_for_Smart_Specialisation.pdf.
- Statistics Bureau of General Affairs Agency (2017). *National Census*. Accessed on 15 March 2018 at <http://www.stat.go.jp/data/kokusei/2015/index.html>.
- Statics Finland. PX-Web databases. Establishments by industry and region 2015 (TOL 2008), Region, Data and Year. Accessed on 15 March 2018 at http://pxnet2.stat.fi/PXWeb/pxweb/en/StatFin/StatFin__yri__alyr/statfin_alyr_pxt_002.px/table/tableViewLayout2/?rxid=011d1e0a-74a9-47ce-80dd-cc63f-479cf1d.
- Teikoku Shoin (2018). Web pages of the publishing company Teikoku Shoin. Accessed on 13 April 2018 at <https://www.teikokushoin.co.jp/>.
- Tiedetreffit (2018). University Association of South Ostrobothnia. Accessed 14 February 2018. <https://epky.fi/epanet/tutkimusryhmat/tiedetreffit-tutustuttaa/>.
- Tietohaarukka – *Tilastotietoa elintarvikealasta* (Information fork – Statistical data on Food and Drink Industries) (2017). Ruokatieto. Finnish Food and Drink Industries’ Federation. Accessed on 22 March 2018 at http://www.etl.fi/media/aineistot/raportit-jakatsaukset/tietohaarukka_2017_suomi_linkitetty_k.pdf

LIST OF INFORMANTS

Professor Anu Hopia
University of Turku, Functional Foods Forum.
10 January 2017.

Professor Yoji Kato
Hirosaki University, Faculty of Education.
12 February 2015.

Development Director Kimmo Kulmala
University Association of South Ostrobothnia.
8 February 2017.

Assistant Professor Kazuhiro Matsumoto
Hirosaki University, Faculty of Agriculture and Life Science, Fujisaki Farm.
16 February 2015.

Associate Professor Matsuzaki Masatoshi
Hirosaki University, Faculty of Agriculture and Life Science.
19 February 2015.

Professor Harri Luomala
University of Vaasa, Faculty of Business, Department of Marketing.
20 February 2017.

Senior Researcher Merja Lähdesmäki
University of Helsinki Ruralia Institute, Seinäjoki.
7 November 2017.

Professor Yuji Nakai
Hirosaki University, the Institute for Food Sciences.
18 February 2015.

Professor, Director Naotsune Saga
Hirosaki University, the Institute for Food Sciences.
18 February 2015.

Senior Researcher, Adjunct Professor Gun Wirtanen
University of Helsinki Ruralia Institute, Seinäjoki.
28 November 2017.

WWW.HELSINKI.FI/RURALIA



UNIVERSITY OF HELSINKI
RURALIA INSTITUTE