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# The role of demand for regional development – Green transformations in the food industries in Scania and Värmland

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VÄSTRA GÖTALANDSREGIONEN

**Title:**

# The role of demand for regional development – Green transformations in the food industries in Scania and Värmland

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**Abstract:** Research on regional transformation typically sees regional economic change as an outcome of innovation and knowledge creation processes. The role of demand, however, has received little attention so far. In this paper, we summarize the empirical research findings from a research project on the role of demand in new regional industrial path development, focussing on the transformation of the food sector towards environmentally friendly production. The food industry is in need to renew its production system in order to cope with climate change and other environmental challenges. Further, it is a consumer-driven industry and characterized by complex and diverse demand conditions, which makes it a relevant case to study the role of demand. Theory building is based on accounts on regional industrial path development and regional innovation systems, as well as sociotechnical transitions. Empirically, we focus on two Swedish regions, Scania and Värmland, and data from a large-scale survey with all food-processing companies in the two regions as well as in-depth interviews with firm representatives and industry experts. The material is analysed in order to map and comprehend the role of altering demand conditions for regional economic transformation. We provide novel research on regional transformation of mature industries and seek to inform policies to promote industrial renewal via demand conditions.

**Keywords**: Regional Development, New Path Development, Sustainability, Food Industry, Sweden

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# 1. Introduction: The role of demand for regional development

In the process of regional development, new industries emerge and old industries transform and renew themselves, or decline. The literature on regional development terms this process as new regional industrial path development (Isaksen and Trippl 2016, Hassink, Isaksen, and Trippl 2019). Existing work on new path development has largely focused on the supply side, that is, how the creation of new knowledge and the recombination of existing knowledge through collaboration and knowledge exchange between actors (e.g. firms, universities, R&D organisations. governmental agencies) influence regional development. However the demand side, notably demand conditions inside and outside the region, also affect regional development. So far, the role of demand has not received much attention in the literature, which we address in this report (Martin, Martin, and Zukauskaite 2019).

We aim to gain a better understanding of the role of demand in new regional industrial path development, focusing on the transformation of the food sector towards more environmentally friendly products and production processes. The focus on the food sector has two interrelated motivations. First, the food industry is the largest manufacturing industry in Europe and with high environmental impact, amongst others through greenhouse gas emissions (Spaargaren, Oosterveer, and Loeber 2012). It faces the need to change and renew its production system in order to cope with climate change and environmental pressures. Second, the food industry is consumer-driven and characterized by complex and diverse demand conditions. On the one hand, consumers all over the world are becoming more conscious about where their food comes from and how it is produced, resulting in new consumer movements (e.g. organic, vegetarian or vegan movements). On the other hand, the global meat and dairy production, heavily responsible for the large environmental impact of the food industry, is expected to increase even further. Producers in the food industry need to operate in this complex and contradictory demand environment. Furthermore, apart from large global trends, there are country and region specific differences which need to be taken into account by the producers when trying to reach certain markets. This makes the food industry and interesting case to study.

The theoretical framework draws on the literature on regional innovation systems and new regional industrial path development, as well as socio-technical transitions (Isaksen, Martin, and Trippl 2018, Geels 2002, Asheim, Isaksen, and Trippl 2019). The literature on new regional industrial path development and regional innovation systems provides a framework for taking into account regional pre-conditions such as industrial structures, policy processes and knowledge dynamics. Socio-technical transition theory is concerned with major transformations in the economy and society, and provides a suitable framework to conceptualize the role of demand.

The empirical analyses focus on two Swedish regions, Scania and Värmland, which both have a traditional stronghold in agriculture and food industries, but have different regional preconditions to nurture industrial renewal. In this report, we provide and analyse empirical results from a large-scale survey among food companies and in-depth case interviews in these two regions, carried out between years 2018 and 2020.

# 2. Theory: New regional industrial path development and socio-technical transitions

Among researchers and policy makers concerned with regional development, there is an increasing interest in the question how new growth paths emerge and develop over time (Hassink, Isaksen, and Trippl 2019). The current debate on new regional industrial path development, however, lacks a conceptualisation of the role of demand. The role of demand is discussed in the literature on socio-technical transitions, which, however, does not explicitly deal with regional development (Coenen, Benneworth, and Truffer 2012). In order to understand the role of demand for new regional industrial path development, we seek bringing those two streams of literature together.

## 2.1 What influences new regional industrial path development?

In evolutionary economic geography, new regional industrial path development is typically seen as the result of endogenous branching processes where existing firms diversify into new fields, for example through spin-offs and a recombination of related knowledge (i.e. related variety) (Boschma and Frenken 2011, Neffke, Henning, and Boschma 2011). The regional innovation systems (RIS) concept takes a similar perspective but places greater emphasis on factors such as regional economic structures, institutions, policy and agency (Isaksen, Martin, and Trippl 2018, Asheim, Isaksen, and Trippl 2019). Isaksen and Trippl (2016) argue that regions with strong policy support and knowledge infrastructure and a diversified industrial basis (i.e. thick and diversified RIS) are more prone to new path development, as they provide a fertile ground for the exchange of related and unrelated knowledge. In contrast, regions with thin support structures and a low degree of industrial diversity (i.e. thin and specialised RIS) are less likely to develop new growth paths, as they lack the necessary economic and institutional breadth. Asheim, Boschma, and Cooke (2011) combine the RIS approach with insights on related variety and combinatorial knowledge, and argue that the integration of different types of knowledge bases (that is, the combination of unrelated knowledge) is a key source for new regional industrial path development. This argument also serves as a basis to outline customized policy approaches. The importance of active policy intervention consisting of concerted, long-term efforts at firm, system, organizational and institutional levels are stressed. This is in line with recent research on the important role of agency and the re-combination of various types of local assets for new path development (Sotarauta and Suvinen 2018, Trippl et al. 2020, Grillitsch and Sotarauta 2020),

The literature on new path development discusses organisational, institutional and policy influences, and places a strong focus on the creation and recombination of knowledge and other local assets, or, put differently, on the supply side of innovation. What remains largely overlooked is the demand side of innovation, that is, how innovation and regional developed are shaped by changes in consumer behaviour. Studies dealing with the role of demand usually focus on demand in the public sector (Edler and Georghiou 2007, Morgan 2013, Uyarra et al. 2017). Public procurement for innovation is often stressed as important policy tool to steer innovation and product development (Edquist and Zabala-Iturriagagoitia 2012, Martin and Coenen 2015). This suggests that policy can contribute to creating favourable demand conditions that drive new regional industrial path development. In the case of food,

this could, for instance, entail procuring environmental friendly and sustainable food products for public canteens, schools and hospitals.

Only few studies analyse the role of private demand in the context of regional development. Grabher, Ibert, and Flohr (2008) argue for an increased attention to customers in regional innovation models. They stress co-development practices between producers and customers, pointing at the role of consumers as knowledge providers. Such a conceptualization of consumers, however, reinforces a supply-dominated view, where consumer knowledge becomes an additional input to the innovation processes. Zukauskaite and Moodysson (2016) argue that demand conditions play a significant role for the evolution of the food industry. On the one hand, consumer attitudes are an important cause for new product development, and on the other hand, consumption is rooted in individual habits, which tend to change slowly. Their study deals with the role of demand, but does not explicitly address the geography of demand.

Grounded on the literature on regional development, Martin, Martin, and Zukauskaite (2019) explore multiple roles that demand can play in new path development. They differentiate among the role as anonymous consumer, sophisticated buyer, active co-developer, public procurer, and norm and value setter. Obviously, general market trends and global demand conditions influence local production systems, which point as a role of demand as anonymous customer. For producers, co-location with sophisticated consumers and clients can be beneficial, as these provide advanced knowledge of the market. This implies that demand-led transformations often originate in regions with high population density and strong business clusters, notably in urban areas. In some cases, consumers actively contribute to regional transformation by providing feedback to producers, participating in firms' innovation processes or generating own products and services. In other cases, the public sector acts as consumer and steers product development and eventually regional development through public procurement. Finally, slowly changing consumer norms, values and habits provide new opportunities and pathways for regional development. These roles influence different types of new path development, including path extension, path upgrading, path importation, path diversification, and path creation (Martin, Martin, and Zukauskaite 2019).

We argue that new regional industrial path development depends on the demand in the region, but also on demand in other locations. Demand conditions vary in different locations due to consumer norms and values, but also due to activities by policy makers that might promote or hinder the consumption of environmental friendly food products. Consumers might perform different roles as enablers, opponents or co-developers of innovations, driving new regional industrial path development and industrial renewal.

## 2.2 The role of demand through the lens of socio-technical transitions

The literature on socio-technical transitions provides further insights on the role of demand. Socio-technical transitions put emphasis on broader transformation processes of the economy and society, and addresses primarily ecological innovations. It has been prominently used to explain low-carbon transitions in fields of transport and energy (Unruh 2000), and recently also to analyse transitions in the food sector (Spaargaren, Oosterveer, and Loeber 2012).

A socio-technical transition describes the long-term process of technological change in co-evolution with other processes such as changes in markets and user practices (Geels 2002, Kemp, Schot, and Hoogma 1998). Particularly the multi-level perspective (MLP) has a strong emphasis on societal change for setting in motion industrial transformation. The MLP considers processes of change at three levels, namely niches, regimes and landscapes. One main assumption is that socio-technical systems are path-dependent and become locked-in over time. These lock-ins are referred to as regimes, which create entry barriers for radical innovations. Path-breaking innovations are assumed to emerge in niches, which provide locations for learning about technologies and user preferences. A successful maturation of a niche (i.e. niche upgrading) may eventually lead to a transformation of the regime. The landscape level represents the exogenous environment that influences both regimes and niches. It includes heterogeneous factors such as oil prices, emigration, political coalitions, or environmental problems (Geels 2002, Geels 2012).

Landscape factors are beyond the control of single actors or groups. Yet, they can influence the behaviour of actors. Growing environmental problems, for example, can raise consumer concerns related to climate change, biodiversity or animal well-being and an interest in where and how food is produced (Spaargaren, Oosterveer, and Loeber 2012). Global trends can lead to changing values and ideologies among consumers and consumer groups and the emergence of new consumer movements (e.g. organic, vegan, non-GMO). Such niche development has been addressed as "grassroot innovations" (Smith, Fressoli, and Thomas 2014). Hence, changes on the landscape level can lead to the emergence of consumer niches that eventually lead to changes in the food regime.

Socio-technical transitions theory allows combining bottom-up movements and global overall trends in the analysis of industrial transformation. It provides an explanation and conceptualisation for how changing demand can give rise to new food practices that challenge the mainstream food system and lead to industrial renewal. It contributes to the objective of this paper as it allows conceptualising changes in demand and user preferences and the emergence of alternative food products.

# 3. Method and research context – the food industries in Scania and Värmland

The paper analyses new path development in the food industries in two regions in Sweden, namely Scania and Värmland. Both regions have traditional industrial strongholds in food, but have different preconditions to nurture the emergence of new development paths.

Scania is an example of a thick and diversified RIS, hosting a number of related industries and a strong R&D and policy support system (Benneworth et al. 2009, Martin and Martin 2017). The food industry consists of around 350 companies, many of which serve international markets (e.g. Findus, Oatly, Cloetta). Regional policy makers are actively engaged in supporting innovation through a number of policy initiatives targeting the food sector. Furthermore, its densely populated urban centres (Malmö with 320.000, Lund with 110.000 and Helsingborg with 98.000 inhabitants) provide a sophisticated local demand.

Värmland is an example of a thin RIS, located in a peripheral area and reliant on traditional industries such as forestry, paper and pulp and steel (Grundel and Dahlström 2016). The food industry consists of around 50 companies serving mostly the Swedish market (e.g. Löfbergs, OLW, Wermlands Mejeri). The region has less favourable conditions for new path development, due to a lack of regional industrial variety and local institutional support. Furthermore, the region is sparsely populated and hosts only one urban centre (Karlstad with 87.000 inhabitants), resulting in a limited local demand for innovative food products.

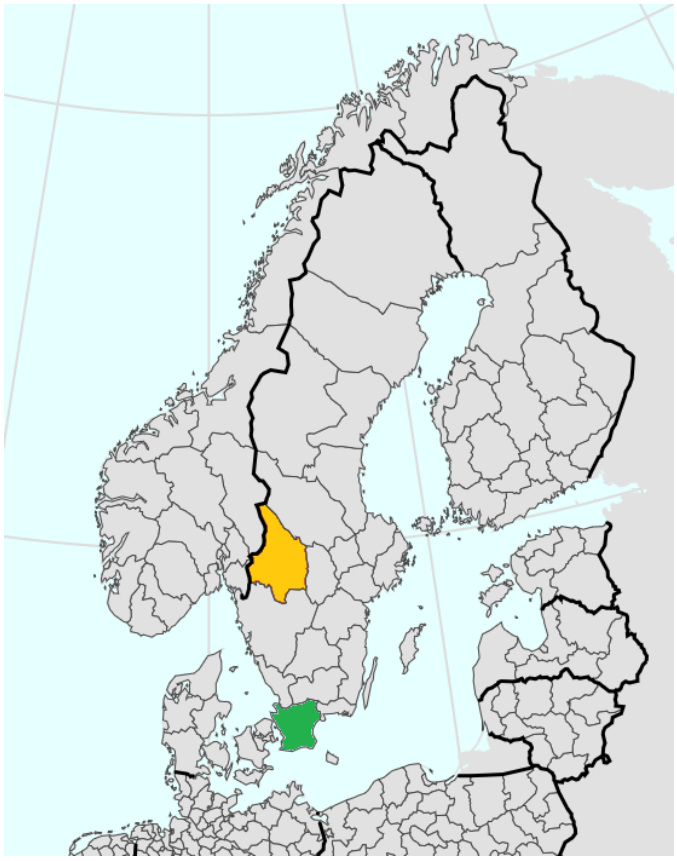

**FIGURE 1: LOCATION OF SCANIA (GREEN) AND VÄRMLAND (ORANGE).**
**SOURCE: OWN MAP**

The research comprises a mixed method approach, consisting of both a large-scale survey among food companies and in-depth case studies on selected firms and their environmental friendly food products. The data collection targets established and new food companies and their perception of and response to changes in demand conditions.

A large-scale survey among food companies in the two regions has been carried out to capture the current and past development of sustainable food production. In a first step, companies were identified with business register data. Email addresses of CEOs were gathered from company websites and social media platforms (Facebook and Linked-In). All CEOs for which email addresses could be obtained were contacted and an email with the survey was sent. For companies were no email address was available or which did not respond, the CEOs or deputy CEOs were contacted by telephone and, if they accepted, interviewed by telephone. In total, 301 survey requests were sent by email and 322 telephone calls were made. Of all 399 firms, 103 companies participated in the survey and 79 replied to all questions, which translates to a response rate of 25% (partly) respectively 20% (fully). The companies

were asked (amongst others) about the share of environmentally friendly products in their overall production, how it has changed over time, and what is enabling and hindering the introduction of more environmentally friendly products. Particular attention was devoted to the role of the RIS environment, as well as on the role of local and non-local demand conditions and changes thereof.

In parallel to the survey, in-depths interviews were carried out with selected companies and industry experts. With the help of the survey results and additional input from local stakeholders, companies that have recently introduced new environmentally friendly food products were identified and contacted for interviews. Two field trips were organized, each of them consisting on-site visits and company interviews, as well as discussions with local decision makers and authorities. The field trips took place in autumn 2018 (Värmland) and spring 2019 (Scania). Nine companies were interviewed in Värmland and eight companies in Scania. The interviews lasted between 90 and 120 minutes and were transcribed and analysed. We used an interview guide and asked about the nature of the firms and their recent environmental innovations, the role and developments of their markets and customers, the role and embeddedness in their home region, as well as future developing prospects of their company and industry. The interview guide was adapted and fine-tuned for each company or organization.

The results from the survey and the interviews are described in the following[1].

# 4. Analysis - results from the survey and the interviews

## 4.1 Findings from the survey

### 4.1.1 General company information

Based on Swedish business register data, a total number of 399 active food-processing companies with headquarters in either of the two regions were identified. 349 (87,5 %) are located in Scania, and 50 (12,5 %) in Värmland. The size of these companies ranges from 0 to 1500 employees, with a mean value of 24,5 and a median value of 4, indicating a screwed distribution with a many small and few relatively large firms. The largest firms are Orkla Foods Sverige AB, Pågen AB and Findus Sverige AB, all of which are located in Malmö, the regional capital of Scania. Large food processing firms with headquarters in Värmland include August Larsson Charkuteri AB, Swed-jam AB and Troll-Gott Konfektyr AB. Further, Wasabröd and OLW are well-known local brands with production facilities in the region, but which have relocated their headquarters outside the region. Table 1 lists the ten largest companies in the dataset.

[1] The authors would like to thank Irene Blomqvist for her assistance with the survey, as well as their families for making both field trips possible.

**TABLE 1: 10 LARGEST FOOD PROCESSING FIRMS IN THE DATASET**

| Company name | Number of employees | Turnover (Tsd SEK) | Main industry sector (SNI) | Main parent company | City (main) | County |
|---|---|---|---|---|---|---|
| Orkla Foods Sverige AB | 1500 | 5295907 | Manufacture of food products | ORKLA ASA | Malmö | Scania |
| Pågen Aktiebolag | 701 | 1682514 | Manufacture of bakery and farinaceous products | POGEN INTERNATIONAL BV | Malmö | Scania |
| Findus Sverige Aktiebolag | 698 | 2659256 | Manufacture of bakery and farinaceous products | Findus Sverige Aktiebolag | Malmö | Scania |
| Cloetta Sverige AB | 507 | 2353601 | Manufacture of cocoa and chocolate confectionery | Cloetta AB | Malmö | Scania |
| BRING FRIGO AB | 427 | 1944510 | Manufacture of food products | POSTEN NORGE AS | Helsingborg | Scania |
| Nordic Sugar AB | 371 | 3107884 | Manufacture of sugar | NORDIC SUGAR HOLDING A/S | Malmö | Scania |
| Malmö Mejeri AB | 285 | 2211416 | Operation of dairies and cheese making | Skånemejerier AB | Malmö | Scania |
| Abdon Finax AB | 280 | 877006 | Manufacture of grain mill products | S. ABDON HOLDING BV | Helsingborg | Scania |
| Continental Bakeries North Europe AB | 209 | 498509 | Manufacture of bakery and farinaceous products | CONTINENTAL BAKERIES BV | Örkelljunga | Scania |
| Kiviks Musteri AB | 199 | 674703 | Manufacture of fruit and vegetable juice | Kivik Holding AB | Simrisham n | Scania |

Table 2 shows the number and size of the firms in the dataset, divided by location. It shows that Scania does not only host more, but also larger firms than Värmland.

**TABLE 2 NUMBER AND SIZE OF THE SURVEY FIRMS IN SCANIA AND VÄRMLAND**

| County | | Number of Employees | Turnover (Tsd SEK) |
|---|---|---|---|
| Scania | Mean | 15,98 | 68385,24 |
| | N | 87 | 87 |
| | Std. Deviation | 44,872 | 340389,286 |
| Värmland | Mean | 7,19 | 16808,19 |
| | N | 16 | 16 |
| | Std. Deviation | 10,784 | 27762,435 |
| Total | Mean | 14,61 | 60373,27 |
| | N | 103 | 103 |
| | Std. Deviation | 41,533 | 313298,252 |

### 4.1.2. Introduction of environmentally friendly food products

The survey included questions on the company's past and present efforts to introduce environmental friendly products, as well as hinders and enablers. In the context of the survey, environmentally friendly products have been defined as products with significantly less environmental impact (e.g. less pollution, less waste, less CO2 emission, higher requirements on animal keeping, etc.), including for example organic food products, but also eco-friendly alternatives to traditional food (e.g. corn instead of meat, oat instead of milk).

Table 3 shows the number of companies that have introduced new environmentally friendly food products in the last five years. It becomes apparent that around one half of the surveyed firms made efforts and had success in introducing new environmentally friendly products, and that this share is similarly high in both regions.

**TABLE 3: INTRODUCTION OF ENVIRONMENTALLY FRIENDLY FOOD PRODUCTS**

| | | | County | | Total |
|---|---|---|---|---|---|
| | | | Scania | Värmland | |
| **In the last 5 years, have you introduced any new food products that are significantly more environmentally friendly than traditional ones?** | Yes | Count | 38 | 10 | 48 |
| | | % within County | 48,1% | 66,7% | 51,1% |
| | No | Count | 41 | 5 | 46 |
| | | % within County | 51,9% | 33,3% | 48,9% |
| Total | | Count | 79 | 15 | 94 |
| | | % within County | 100,0% | 100,0% | 100,0% |

When asking the companies about examples of recently introduced environmentally friendly food innovations, the most frequently mentioned examples include transitions from conventionally grown raw materials to organic ones (e.g., organic flour and yeast to produce bread and pastry; organic fruits to produce juice and smoothies; organic milk and berries to produce yogurts and ice cream). In many cases, the companies highlighted that they also began to source raw materials from local farmers, which allows them to reduce environmental impact from transportation. Another field in which innovations were introduced were packaging and waste management. This includes new techniques and materials to reduce environmental impact from packaging, new production methods and machinery to reduce food waste in the production process, as well as the re-use of food waste for generating biogas. A number of firms also mentioned examples of innovative new food products and business models. This includes the introduction of plant-based alternatives to animal-based meat and dairy (including readymade dishes and drinks from soy, oat and corn), but also food from by-products that were previously wasted and are now processed further (e.g. fresh juices made from fruit that is judged too

unattractive for sale in supermarkets; or bouillon from seafood that does not have the right size and appearance to be sold to the end-consumer).

**TABLE 4: USE OF ECO LABELS**

| | | Answer | % | Count |
|---|---|---|---|---|
| **Do you have any products with eco-label? (eg. EU-eko, KRAV) [YES/NO]** | | Yes | 50.59% | 43 |
| | | No | 49.41% | 42 |
| | | Total | 100% | 85 |
| **If YES:** | | | | |
| | What is the share of eco-labelled products in your overall sales today (approx.)? | <25% | 46.51% | 20 |
| | | 25-50 % | 13.95% | 6 |
| | | 51-75 % | 9.30% | 4 |
| | | > 75 % | 30.23% | 13 |
| | | Total | 100% | 43 |
| | What was the share of eco-labelled products in your overall sales 5 years ago (approx.) (approx.)? | < 25 % | 65.79% | 25 |
| | | 25-50 % | 15.79% | 6 |
| | | 51-75 % | 0.00% | 0 |
| | | > 75 % | 18.42% | 7 |
| | | Total | 100% | 38 |
| **If NO:** | | | | |
| | Why do you have no eco-labelled products? [multiple choice] | Our products do not qualify for an eco-label | 20.00% | 8 |
| | | We do not have time/resource/capacities to apply for an eco-label | 22.50% | 9 |
| | | We do not believe that an eco-label would add value to our products | 25.00% | 10 |
| | | Other reasons | 32.50% | 13 |
| | | Total | 100% | 40 |

When it comes to the use of eco labels (e.g. EU-eko, KRAV), around one half (51%) of the companies stated that they have products with eco-labels (see table 4). The share of eco-labelled products in overall sales is below 50% for most companies; however, this share has increased considerably during the last five years. Asking about reasons for not having any eco-labelled products, many firms state that they do not believe that an eco-label would add value to their products (25,0 %), they do not have time, resources or capacities to apply for an eco-label (22,5%), or that their products do not qualify for an eco-label (20,0%). In the interviews, it became apparent that the costs and the difficult process of applying for an eco-label was perceived as a central hinder for many of the small-sized firms, but also that an eco-label does not match the business models of many of the firms. For example, several firms stated that they receive their raw materials from local small-scale farmers, and thus, they cannot not certify that all raw materials are ecologically produced. Others state that they deliver mostly to local customers, and that reputation and trust that they have built up over time is more valuable than an official eco-label.

**TABLE 5: ENABLERS FOR THE INTRODUCTION OF ENVIRONMENTALLY FRIENDLY FOOD PRODUCTS**

| **Which of the following developments have led to the introduction of new environmentally friendly products in your company?** | **Mean** | **N** | **Std. Deviation** |
|---|---|---|---|
| A growing demand for environmentally friendly food products on the Swedish market | 2,48 | 40 | 0,640 |
| A growing interest in environmental matters in the society at large | 2,48 | 40 | 0,640 |
| Producing environmentally friendly is good for our company's image/reputation | 2,48 | 40 | 0,599 |
| A growing demand for environmentally friendly food products among our local customers | 2,25 | 40 | 0,742 |
| A growing demand for environmentally friendly food products in the public sector (e.g. schools, hospitals, etc.) | 2,05 | 39 | 0,857 |
| Better supply with agricultural raw materials allowed the introduction of new environmentally friendly food products | 1,95 | 40 | 0,749 |
| An increasing political agenda for environmental issues (e.g. environmental regulations, etc.) | 1,95 | 39 | 0,759 |
| A growing demand for environmentally friendly food products on the global market | 1,88 | 40 | 0,822 |
| We have discovered good opportunities to develop new environmentally friendly food products together with our customers. | 1,83 | 40 | 0,813 |
| Our consumers requested new environmentally friendly food products from us | 1,83 | 40 | 0,844 |
| A higher profitability of environmentally friendly food products | 1,65 | 40 | 0,622 |
| New technologies permitted the introduction of new environmentally friendly food products | 1,63 | 40 | 0,774 |

Among the companies that have introduced new environmentally friendly food products during the last five years (see table 5), a number of reasons were stated as enablers. Overall, the reasons that were mentioned as most important is a growing demand for environmentally friendly food products on the Swedish market, a growing interest in environmental matters in the society at large, and the fact that producing environmentally friendly is good for a company's image/reputation. In addition, growing demand for environmentally friendly food products among local customers is regarded important. This shows that companies observe a trend towards environmentally friendly food in Sweden as well as locally, and that costumers value a company's effort to produce environmental friendly. However, the results also show that the growing demand for environmentally friendly food products does not turn directly into profits, as only few firms mention profitability of as a reason.

**TABLE 6: HINDERS FOR THE INTRODUCTION OF ENVIRONMENTALLY FRIENDLY FOOD PRODUCTS**

| **Which of the following developments have prevented you from introducing new environmentally friendly products?** | **Mean** | **N** | **Std. Deviation** |
|---|---|---|---|
| Our consumers do not request environmentally friendly food products from us | 2,13 | 32 | 0,793 |
| There is not enough demand for environmentally friendly food products among our local customers | 2,06 | 35 | 0,873 |
| There is not enough profitability of environmentally friendly food products | 2,00 | 32 | 0,718 |
| There is not enough demand for environmentally friendly food products on the global market | 1,85 | 33 | 0,712 |

| | | | |
|---|---|---|---|
| There is not enough demand for environmentally friendly food products on the Swedish market | 1,79 | 33 | 0,696 |
| We are not able to engage customers in joint development of environmentally friendly food products | 1,75 | 32 | 0,718 |
| Lack of supply with agricultural raw materials hinders the introduction of environmentally friendly food products | 1,72 | 32 | 0,772 |
| Lack of technical solutions hinders the introduction of environmentally friendly food products | 1,66 | 32 | 0,787 |
| There is no substantial political agenda for environmental issues (e.g. environmental regulations, etc.) | 1,59 | 32 | 0,712 |
| There is not enough demand for environmentally friendly food products in the public sector (e.g. schools, hospitals, etc.) | 1,50 | 32 | 0,622 |
| Environmentally friendly products do not match our company's product portfolio | 1,50 | 32 | 0,672 |
| There is not enough interest in environmental issues in the society at large | 1,48 | 33 | 0,566 |

Among those companies that did not introduce any new environmentally friendly food products (see table 6), the most important hinder was the lack of demand for such products, locally and nationally, but also globally. Another significant hinder was the lack of profitability of environmentally friendly products. Environmentally friendly food is often significantly more expensive to produce, but even among the environmentally conscious customers, the willingness to pay significantly more for such products is often low. Factors that were not directly related to demand, such technological limitations, political and institutional boundaries, or lack of supply with suitable raw materials, were not mentioned as relevant by the firms. This underscores the key role of demand as an enabler and hinder for green transformation processes.

**TABLE 7: GEOGRAPHICAL LOCATION OF DEMAND AND SUPPLY**

| | | Minimum | Maximum | Mean | Std Deviation | Variance | Count |
|---|---|---|---|---|---|---|---|
| **Could you please indicate where your markets/customers are situated geographically (approx. % of your sales)** | In the same region ("län") | 0.00 | 100.00 | 62.06 | 39.33 | 1547.19 | 81 |
| | In other parts of Sweden | 0.00 | 100.00 | 25.01 | 30.26 | 915.52 | 81 |
| | In other EU countries | 0.00 | 60.00 | 5.63 | 13.65 | 186.36 | 81 |
| | Outside EU | 0.00 | 100.00 | 2.27 | 11.35 | 128.84 | 81 |
| **Could you please indicate where your main suppliers are situated geographically (approx. % of your purchases** | In the same region ("län") | 0.00 | 100.00 | 46.01 | 41.52 | 1723.51 | 80 |
| | In other parts of Sweden | 0.00 | 100.00 | 26.88 | 31.93 | 1019.38 | 80 |
| | In other EU countries | 0.00 | 80.00 | 16.90 | 24.05 | 578.16 | 80 |
| | Outside EU | 0.00 | 99.00 | 3.88 | 13.42 | 180.01 | 80 |

In order to better understand the geography of the food industry, the companies were asked about the geographical location of their supplier and customers (see table 7). By far the largest share of their sales is generated in the home region (62,9%), followed by other parts of Sweden (25,%). Only a small share of all sales is generated in other EU countries (5,6%) or outside the EU (2,3%). This shows that the food companies mostly target local customers, again pointing at the key role of local demand for most firms. When it comes to the geography of supply, that is, where the companies source their raw materials from, the picture is alike. Most of the suppliers are situated in the same region (46,0%) followed by other Swedish regions (26,9%). While the share of suppliers from outside the EU is only marginal (3,9%), a considerable share of the suppliers are located in other EU countries (16.9%). The figures imply that firms tend to source raw materials in a wider geographical radius, including other EU countries, whereas the processed food is predominantly sold locally or nationally. Nevertheless, the region has the central role for both supply and demand in this industry.

## 4.2 Findings from the interviews

Our interviews complement the survey by adding qualitative in-depth findings on a selection of firms in the two regions. The interviews are in line with the survey results, yet provide a more nuanced picture on the changing demand for food products and implications for food producing companies in the two regions.

### 4.2.1 Interview findings from Scania

The interviewed firm representatives in the Scania region expressed, irrespective of the type of food produced, that their companies benefit from open-minded consumers in their home region who are willing to test new variations of food products. The majority of companies observe a growing consumer awareness for the environmental impact of food. Many firms see an increasing interest for plant-based food products as alternatives to meat and dairy products. Some years ago, these products were regarded as niche market targeting a small group of vegan and allergic consumers. The interviewees had consensus that this trend has become increasingly mainstream and does affect their establishments and product development significantly. The company representatives state that they observe a general trend in the society and that they are facing growing consumer groups who are conscious about the environmental impact of food. Commonly, they refer to young adults, especially from urban areas, who give momentum to demand for these products. Companies include established food producers, which increasingly include vegetarian and vegan foodstuffs in their assortments (e.g. Orkla, Findus), but also younger companies that positioned themselves prominently on the market with an entirely vegetarian and/or vegan product portfolio (e.g. Oatly, Anamma). Latter companies typically have as strategy to "veganize" existing meat or dairy products. Company-owned restaurants in urban areas create a link between food producers and consumers, where the consumers get the opportunity to taste food and provide feedback to the producer. Social media is frequently used for obtaining feedback regarding product characteristics such as texture and taste. The interviewed company representatives also observe an increasingly diversified market and high consumer demands regarding quality and sophistication of plant-based products.

This growing trend towards plant-based food also lead to the foundation of new firms in the region. Start-ups can be found where university graduates, themselves part of the environmental-awareness consumer movement, experiment around product development and market introduction of novel plant-based food products (e.g. Lupinta). Furthermore, new firms arise based on novel business ideas such as insect-based food (e.g. Entofoder), or growing algae (e.g. Simris Alg).

Most companies that orient their strategies on the consumer trend of plant-based food consider and market themselves as promoters of more sustainable life styles and sustainability. Among the interviewed firms, this image is considered as important for being perceived as attractive employer for young and qualified labour.

As the consumer demands put higher requirements on the sophistication of foodstuffs, the food producers also benefit from collaboration with universities and research organisations in the region. Many of the interviewed companies indicate research and development (R&D) activities in the recent years. These do not only include in-house R&D, but also R&D collaborations with other organisations in the regional innovation system of Scania.

The food producers, however, also face limitations and hinders for responding to the changing demand. These include, for example, additives that are limited to animal-based food and are not certified for use in plant-based food, or encumbers when it comes to naming and marketing new foodstuff (e.g. using terms such as “milk” or “sausage” to refer to plant-based alternatives). To facilitate product development and market introduction, a group of local companies has recently created a new branch organisation (Växtbaserat Sverige), which shall help to lobby for their interests.

While our interviews have shown the trend towards plant-based foodstuffs as very prominent in Scania, the interview partners also mentioned a major consumer interest regarding locally produced food. New research collaborations therefore also address the growing and use of Swedish resources (e.g. beans, oats), which also has led to new collaborations and testing with farmers in the region.

The interviewed companies also indicated an increasing consumer demand for organic foodstuffs. The company representatives expressed challenges regarding the availability of organic raw materials, in cases where inputs were obtained from the larger world market. Among the interviewed firms, the only food producer that had made a complete shift to organic food products was a brewery. In that case, the government-owned chain of liquor stores in Sweden, Systembolaget, had been a key driver for that development by making the organic beers more attractive and profitable.

### 4.2.2. Interview findings from Värmland

Also in the Värmland region, the in-depth interviews reveal an impact of changing consumer demands on the local food producers. In contrast to the Scania region, where we observe a growing demand for innovative and plant-based food alternatives, changes in demand in the Värmland region are more geared towards locally produced food. A further finding is a comparatively strong local demand for traditional foodstuffs (e.g. bread, milk, beer, fruits and vegetables), as opposed to new foodstuff. Demand in Värmland is closely intertwined with regional values, and many consumers strive to support producers from their home region. With some exceptions, the interviewed food producers refer to a

strong regional market orientation and an increasing demand for locally produced food in the population.

The interviews in Värmland include several examples of food producers of different foodstuffs where strong demand for locally produced food have led either to re-localization of production from other regions or the new establishment of production in the region (e.g. Wermlands mejeri; Rawchokladfabriken). An example is the case of a dairy, jointly founded by local farmers and entrepreneurs to process and market locally produced milk products. Due to high consumer interest in locally produced food, these regional dairy products now account for the bulk market share of dairy sold in the region. Another example is the production of beer and the establishment of microbreweries (e.g. Good Guys Brew, Wermlands brygghus). Despite the absence of previous knowledge or skills regarding beer brewing in the region, a lively brewery culture has grown in Värmland, enabled by the strong consumer interest for regionally produced food and drinks. In many cases, these beers are directly sold to pubs and restaurants in the region.

Another finding from the in-depth interviews and document studies is the increasing link to regional policy strategies and regional development in general. The strong valuation of regionally produced food among residents in Värmland has not only given momentum to a growing demand for regional foodstuffs; rather, it has also become of crucial importance for marketing the region as a touristic destination. In particular, regional policy strategies endeavour leaping up the strong consumer values for regionally produced food and aim at promoting Värmland as a food tourism destination.

# 5. Conclusion and discussion

This report addresses the role of demand for regional industrial path development and draws on empirical evidence from the food industries in two Swedish regions, Scania and Värmland. The food industry is exposed to a large variety of consumer demands and has a considerable environmental impact, which makes it a relevant case to study.

Scania is an example of a thick and diversified RIS, hosting a number of related industries and a strong R&D and policy support system. Furthermore, it possesses densely populated urban centres that provide a sophisticated local demand. Värmland is an example of a thin RIS, located in the Swedish periphery and reliant on traditional industries such as forestry, paper and pulp and steel. According to insights from the existing literature, this type of RIS has less favourable conditions for new path development due to a lack of regional industrial variety and local institutional support.

Our findings from the large-scale survey, in-depth interviews and document studies indicate that demand and changes thereof have played an important role for path development in both regions. Yet, the particular role that demand has played in the respective regional industries is different, and it has induced different kinds of development trajectories. In the Scania region, demand is strongly geared towards plant-based alternatives to meat and dairy products. This influences many local producers to adjust their products and production processes to meet that new demand. This demand is in large parts formed by a climate aware and young consumer group, playing the role of sophisticated buyers (Martin, Martin, and Zukauskaite 2019). Demand within the region, carried out by the local residents, is vital for

new regional industrial path development. In the Scania case, larger urban centres serve as arena where contact with consumers occurs and where consumer feedback is obtained. This correspondents to a role of the customer as active co-developer (Martin, Martin, and Zukauskaite 2019). Local consumer feedback is used not only for product development to target the local market, but also the national and partly international market. As many of the novel food products are rather sophisticated, the companies in Scania benefit from location in an organizationally thick RIS, providing opportunities for local collaboration with universities and research centres. Changing consumer behaviours and the demand for new products have stimulated new collaborations between RIS organizations. We observed new collaborations between the local university, food processing companies and regional farmers regarding novel crops and farming techniques. The changing demand conditions also trigger firms to engage in disputing food-related legislations. Companies from the region were involved in founding a new branch organization for plant-based foods; and by implication, the foundation of a new actor in the innovation system. Seen through the lens of socio-technical transition theory, new path development in the food industry has given momentum to a process where a former niche market, namely plant-based foodstuffs, could eventually replace the existing regime, namely meat and dairy products.

In Värmland, demand of locally produced food has been identified as one major driver for new path development in the industry. Strong regional values and growing demand for regional food enabled the emergence of new and the change of existing firms. Thus, also in the case of Värmland, the particular demand expressed by the local consumers is critical and of particular relevance for new path development. A common green transformation in in the food industry in Värmland implies a re-configuration of supply chains, including sourcing of organic instead of conventionally grown raw materials, and sourcing from local supplies, reducing environmental impact from transportation. The strong regional demand for locally produced food has clearly contributed to lift Värmland's identity as a food-producing region, and eventually to announcing food tourism as a focus area for regional policy.

Frequently, green innovations also occur around packaging and waste management, reducing environmental impact from packaging and closing material loops. Radical green transformations are often connected to entirely new products and business models, in particular the introduction of plant-based alternatives to animal-based meat and dairy, which we observed in Scania. We find that a growing environmental awareness among consumers is a key motivation for many of the established firms. An intrinsic motivation to offer environmental friendly products can often be observed among start-ups and young firms.

Overall, we find that the transformation of regional economies towards more environmentally friendly production is not the mere result of innovation by firms, but often caused by changes in demand. We find that demand, notably the consumer, has different roles to play. Clearly, general market trends and global demand conditions influence local production systems. For producers, co-location with sophisticated consumers can be beneficial, as these provide advanced knowledge of the market. This implies that demand-led transformations often originate in regions with high population density, notably in urban areas. In some cases, consumers actively contribute to regional transformation by providing feedback to producers, participating in firms' innovation processes or generating own products and services. Further, slowly changing consumer norms, values and habits provide new opportunities and pathways for regional development. We conclude that policies to promote regional industrial renewal should not only target the supply side of innovation, but also the demand side, either directly via public-procurement or indirectly via education and awareness building.

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