



Scan of Regional Food Clusters in the North Sea Region

Summary Report

**The Interreg IVB
North Sea Region
Programme**



European Union



The European Regional Development Fund

Author:

Drs. Gang Chen, Department of Environmental and Business Economics, University of Southern Denmark

Co-authors:

Pam Jackson, Business School, University of Hull

Prof. Chee Wong, Logistics Institute, University of Hull

Editors:

Drs. Lisbeth Brøde Jepsen, Department of Environmental and Business Economics, University of Southern Denmark.

Prof. Jacob Kronbak, Department of Environmental and Business Economics, University of Southern Denmark.

Ian Mathie, SEStran

Dr. Bart Vannieuwenhuyse, POM West Flanders

Contributions – Regional Reports:

Belgium: Liesbet Pauwels, POM West Flanders

Denmark: Drs. Malene Damsted, University of Southern Denmark

England: Andrew Collinson, Yorkshire Forward

Pam Jackson, Business School University of Hull

Prof. Chee Wong, Logistics Institute University of Hull

Germany: Claudia Harms, City of Bremerhaven

Norway: Jan Erik Netter, Port of Kristiansund and Nordmøre/Netter Analyse

Scotland: Ian Mathie, SEStran

Dr. Yuhong Wang, TRI

Sweden: Drs. Kristina Liljestrand, Chalmers University of Technology

Berit Mattsson, Region Västra Götaland

Prof. Kaj Ringsberg, ILAB

Gustaf Zettergren, Region Västra Götaland

1 INTRODUCTION

As part of the Interreg IVB North Sea Region (NSR) Programme, the “Connecting Food Port Regions - Between and Beyond”, or in short “Food Port” project, aims to develop the North Sea Region (NSR) as the best food cluster and hub in Europe for food products delivered via efficient and sustainable transport systems e.g. “green transport corridors”.

Work package 5.1 “Scan of regional food clusters” is a quick market analysis. This analysis aims at, (1) giving a market overview by summarizing the food production and trade in the NSR countries; (2) describing the food supply chains characteristics and trends in the NSR region.

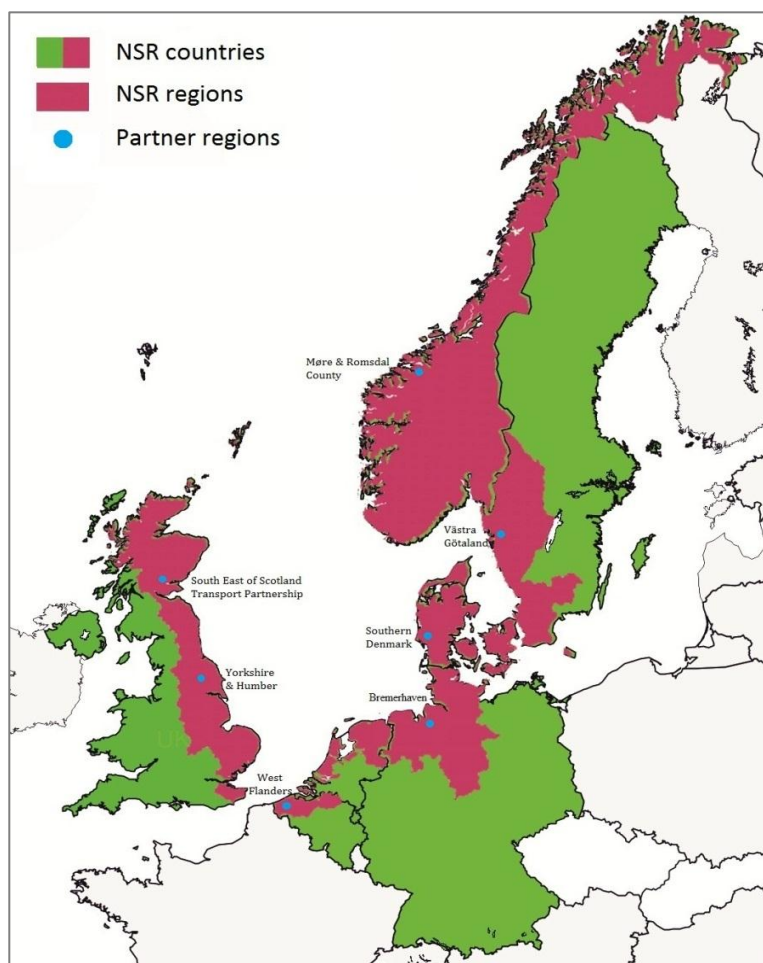


Figure 1. The geographical regions around the North Sea

The NSR region, as shown in red in Figure 1, consists of the whole of Norway and Denmark, the eastern parts of the UK, parts of the Flemish Region of Belgium, the north western regions of Germany, the northern and western parts of the Netherlands and the south western region of Sweden. In total it includes 49 regions at the NUTS-2 level. The blue dots in Figure 1 represent the partner regions, which cover a big part of the transport facilities in the NSR region. Comprehensive studies on these regions will provide in deep knowledge of food supply chains in the NSR region and enable to identify major green transport corridors for food products.

The structure of this short report is: Section 2 – an introduction to the NSR countries as a food cluster; Section 3 – food trade between the NSR countries; Section 4 – the transport service for the food trade; Section 5 - a SWOT analysis of the key components of the food supply chains in the partner regions; Section 6 – the potential benefits of advanced food supply chain.

2 THE NSR COUNTRIES – A STRONG FOOD CLUSTER

The seven NSR countries form a thriving region for food production and trade. There is 42 million hectares land in total for agriculture use. According to the official statistics in Eurostat, one third of food products in Europe are processed in the NSR countries, weighting up to 300 million tonnes. Major food products in 2010 include 109 million tonnes of animal feeding stuffs, 21 million tonnes of meat (incl. poultry meat), 15 million tonnes of oils and fats, 21 million tonnes of dairies and cheese, 18 million tonnes of grain mill products, 10 million tonnes of bread and cakes, 21 million tonnes of beer and 21 billion litres of soft drinks and mineral waters.

The distribution of food production activities varies between different food groups. For example, Norway produces two thirds of fish in the NSR countries; more than half of the potatoes are produced in Netherlands; more than 80% of spirits, cider and fruit wines are produced in the UK; and 80% of non-distilled fermented beverages are produced in Sweden.

Table 1. Production and export of foodstuffs in EU in 2010 (million tonne)

	NSR countries	Non-NSR countries in EU 27	EU 27 plus Norway
Food production	301	594	893
Food export to world (percentage to food production)	147 (49%)	192 (32%)	339 (38%)
Food export to EU 27 and Norway (percentage to food production)	120 (40%)	146 (25%)	266 (30%)
Food export to the NSR countries (percentage to food production)	70 (23%)	62 (10%)	133 (15%)

Note: the data source is Eurostat [DS-018995].

Food trade develops in the NSR countries, because of the mismatch of food production and consumption, and diverse customer preferences as well. As shown in Table 1, nearly 50% of the foods processed in the NSR countries were exported to the whole world in 2010, while the ratio for Europe is only 38%. Within Europe 266 million tonnes foodstuffs were traded across country borders, among which 133 million tonnes were delivered to the NSR countries. Indeed, the NSR countries are a strong regional cluster for food production and trade.

Food trade between the NSR countries, up to 70 million tonnes in 2010, can be categorized into some major types according to SITC¹ standard, as shown in Table 2. The biggest food types, in terms of trade volume, are cereals, vegetables/fruits and animal feeding stuffs.

Table 2. Total volumes of food trade between the NSR countries in 2010 (unit: tonne)

Food type	Trade Volume	Food type	Trade Volume
SITC-00 live animals	1,635,684	SITC-06 sugar, salt and honey	2,780,263
SITC-01 meat	4,009,960	SITC-07 coffee, tea, cocoa, etc.	1,472,166
SITC-02 dairy and birds' eggs	5,861,022	SITC-08 animal foods	13,263,407
SITC-03 fish	2,052,704	SITC-09 miscellaneous edibles	2,574,033
SITC-04 cereals	13,242,579	SITC-11 beverages	8,806,834
SITC-05 vegetables and fruits	13,868,624	SITC-12 tobacco	130,570

Note: data source includes Eurostat and national statistic databases in NSR countries.

¹ Reference: <http://unstats.un.org/unsd/trade/sitcrev4.htm>

3 FOOD TRADE BETWEEN THE NSR COUNTRIES

This section presents the national-level food flows between the NSR countries, focusing on the major food types, trade partner relations and trade balance. In the end of this section, we show the trade flows of some food products with maps.

The trade volumes (covering all types of food) between the NSR countries are shown in Figure 2, from which we can see the origin and destination of food trade. For example, the highest yellow bar means the food export volume from Germany to Netherlands was over 15 million tonnes in 2010. As shown in Figure 2, Belgium, Germany and the Netherlands have the largest trade volumes to each other. The UK is also a big food buyer for the above three countries, but not a big seller. Germany has high trade volumes with Denmark. Norway, Sweden and Denmark have strong trade relations with each other, although the trade volumes are not as high as the ones between the other NSR countries.

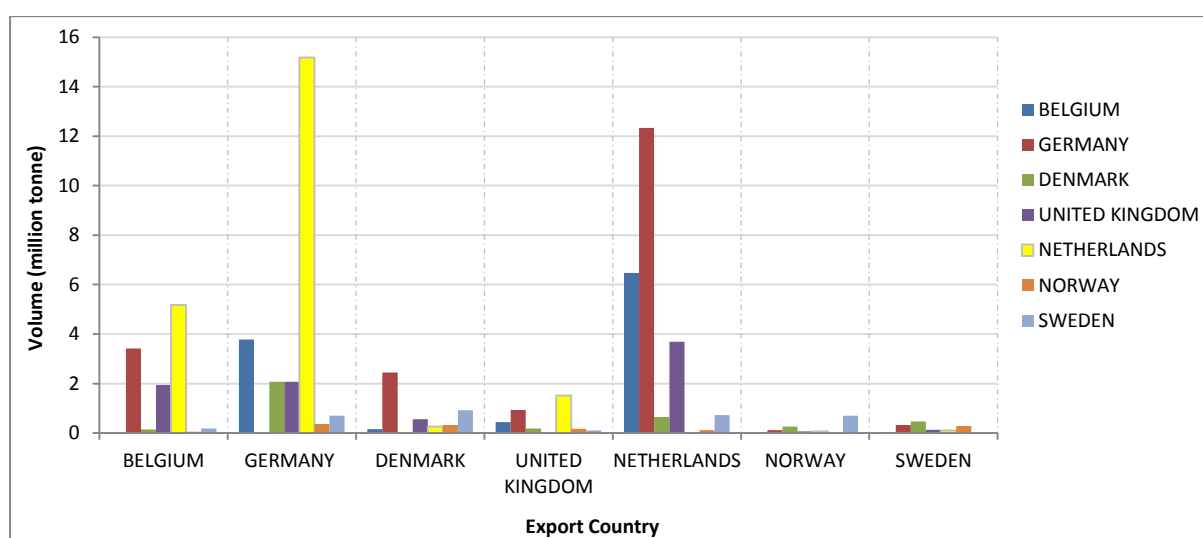


Figure 2. Food trade volumes between the NSR countries (all types of food)

The food flows in Figure 2 can be disaggregated for each food type and each export country, as shown in Figure 3~9. Figure 3 shows the food exports from Belgium to the other NSR countries. Most of the foods are delivered to Germany, the Netherlands and the UK. The foods exported to Denmark and Sweden is mainly cereals, vegetables and fruits.

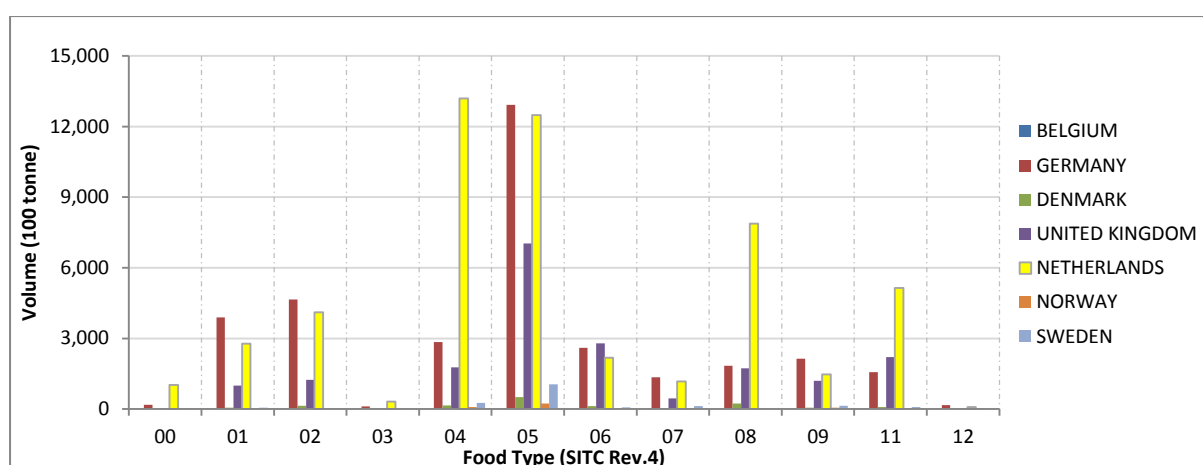


Figure 3. Food export from Belgium to the other NSR countries

Figure 4 shows the food exports from Germany to the other NSR countries. Most of the beverages are exported to the Netherlands, the same goes for live animals and fish. The Netherlands is also the biggest buyer for the other types of food, except for sugar and honey. The foods exported to Norway are mainly cereals; while the foods exported to Denmark, Sweden and Belgium include several types, such as cereals, vegetables and fruits, meat, dairy products and animal feeding stuff.

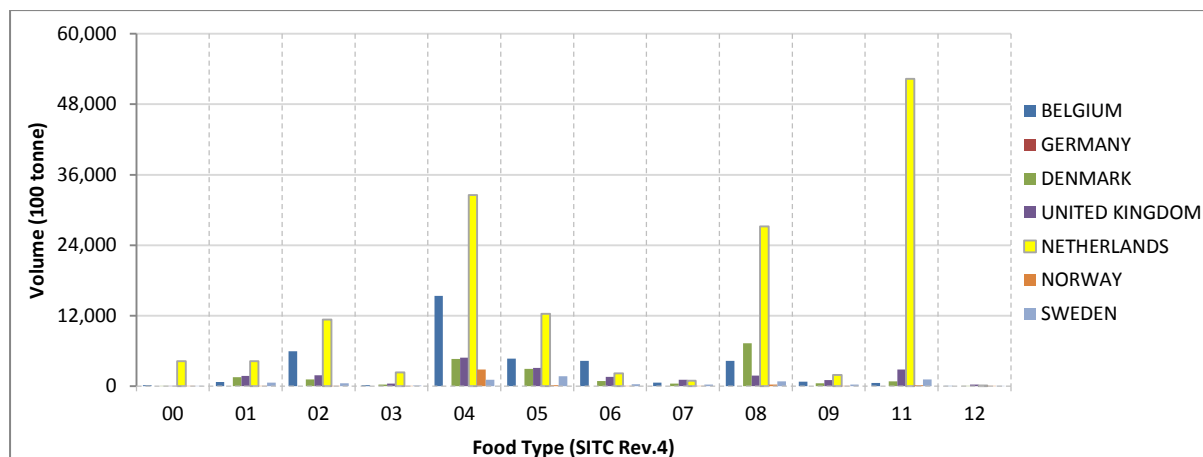


Figure 4. Food export from Germany to the other NSR countries

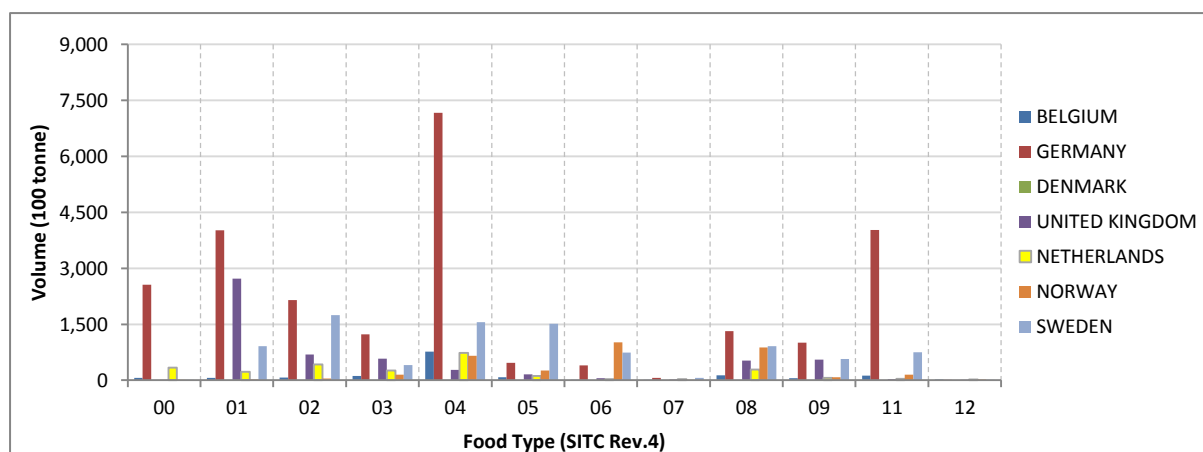


Figure 5. Food export from Denmark to the other NSR countries

Figure 5 shows the food exports from Denmark to the other NSR countries. Norway is the biggest buyer for sugar and honey, and Sweden is the biggest buyer for vegetables and fruits, while Germany is the biggest buyer for the remaining types of food. Half of the foods exported to the UK are meat, while the other half includes dairy product, fish, animal feeding stuff and miscellaneous edible products. The foods exported to the Netherlands and Sweden is relatively diverse. The export volume to Belgium is small. Denmark exports little coffee/tea and tobacco.

Figure 6 shows the food exports from the UK to the other NSR countries. The percentage of cereals export is very high in the UK, most of which are exported to the Netherlands, Germany and Belgium. The Netherlands is the biggest buyer for most of the food types, followed by Germany and Belgium. The foods exported to Norway are mainly fish, vegetables, fruits, sugar, honey, animal feeding stuff and cereals. The foods exported to Denmark and Sweden include several types, such as cereals, vegetables and fruits, meat, dairy products, beverages and animal feeding stuff, but the volumes are relatively low.

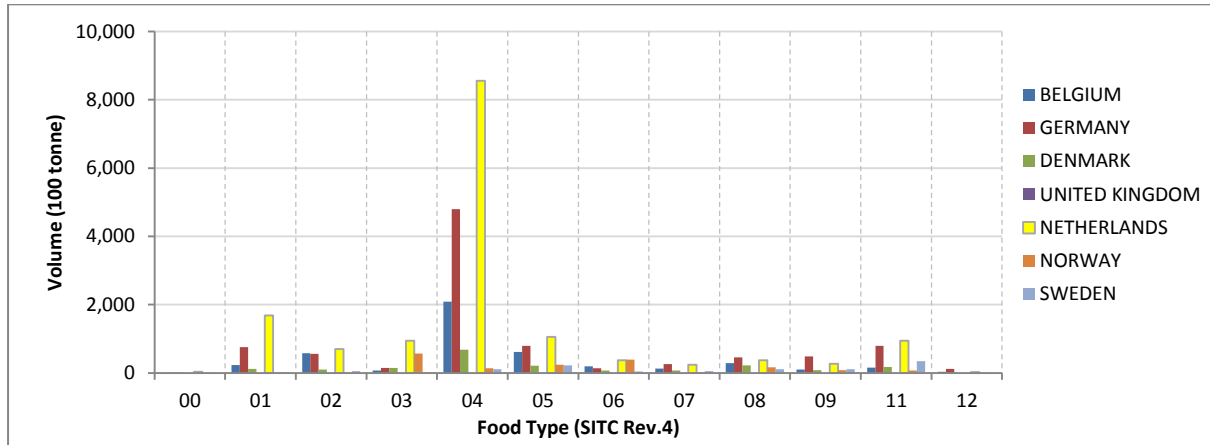


Figure 6. Food export from the UK to the other NSR countries

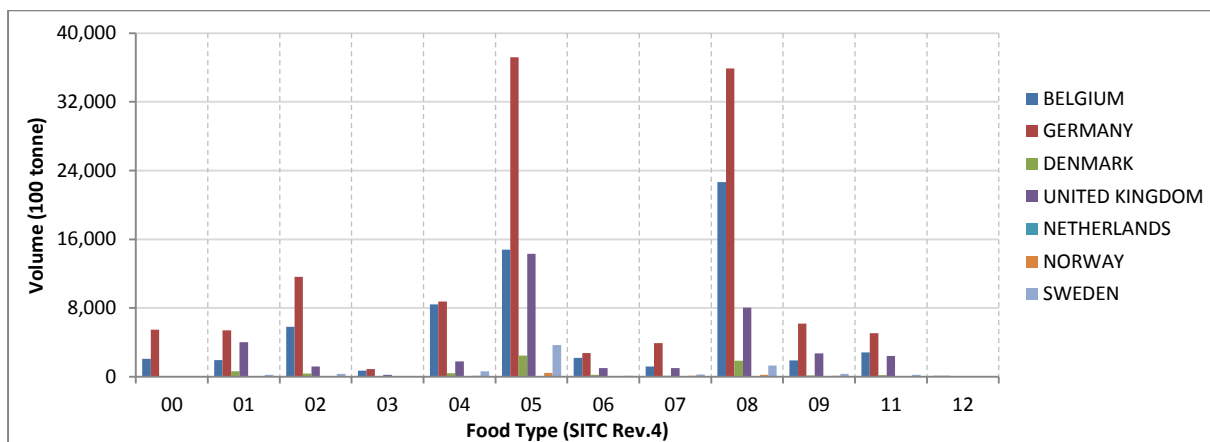


Figure 7. Food export from Netherlands to the other NSR countries

Figure 7 shows the food exports from the Netherlands to the other NSR countries. The percentages of vegetables, fruits and animal feeding stuff are relatively high in the Netherlands. Germany is the biggest buyer for all the food types, followed by Belgium and the UK. The foods exported to Norway are mainly vegetables and fruits. The foods exported to Sweden and Denmark is mainly vegetables, fruits and animal feeding stuff.

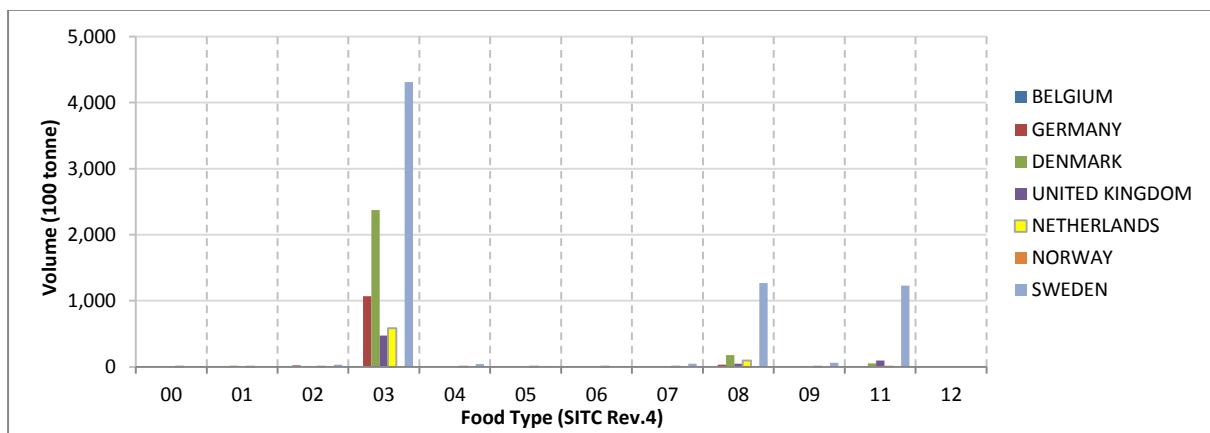


Figure 8. Food export from Norway to the other NSR countries

Figure 8 shows the food exports from Norway to the other NSR countries. The percentage of fish export is extremely high, followed by animal feeding stuff and beverage. The other food

types are exported in very low volumes. Norwegian fish are exported to all the other countries, except Belgium that only buys a small volume. Most of animal feeding stuff and beverage are exported to Sweden.

Figure 9 shows the food exports from Sweden to the other NSR countries. The percentage of cereals export is relatively high in Sweden. Norway is the biggest buyer for animal feeding stuff and miscellaneous edible products; Germany is the biggest buyer for cereals and beverages; and Denmark is the biggest buyer for the remaining types of food. The foods exported to Belgium are mainly cereals and fish, and for the Netherlands they are cereals and animal feeding stuff.

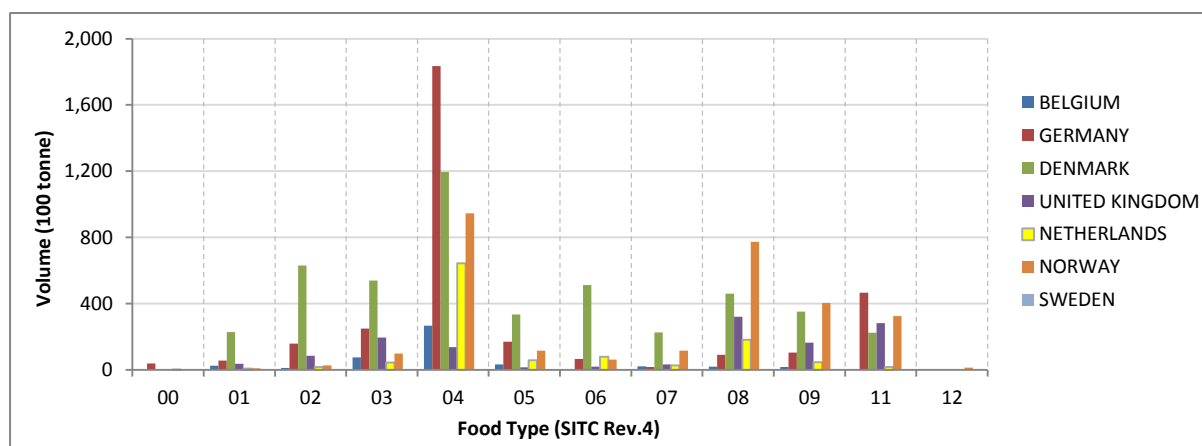


Figure 9. Food export from Sweden to the other NSR countries

Table 3 presents the trade balance, using the ratio of export volume and import volume for each food type. A value of 1.00 indicates a perfectly balanced trade where the import volumes are equal to the export volume. If the ratio is less than 1.00 then the import is higher than the export and if the ratio is more than 1.00 then the export volumes is higher than the import volumes. Significant trade imbalance can be observed for Norway, Sweden and the UK, as these countries import much more than export for most food types. Comparatively, Germany, Belgium and the Netherlands, have good balance for most food types.

Table 3. Food trade balance of the NSR countries (export volume/import volume)

SITC	Belgium	Germany	Denmark	United Kingdom	Netherlands	Norway	Sweden
00	0.51	0.54	<u>66.34</u>	1.09	1.35	<u>0.31</u>	<u>6.18</u>
01	2.59	0.63	<u>3.06</u>	<u>0.29</u>	1.37	0.52	<u>0.20</u>
02	0.82	1.09	2.12	0.39	1.16	0.67	<u>0.34</u>
03	0.39	0.93	0.79	0.96	0.44	<u>10.78</u>	<u>0.25</u>
04	0.68	2.42	1.57	1.85	0.36	<u>0.01</u>	1.36
05	1.69	0.49	0.40	<u>0.13</u>	2.80	<u>0.02</u>	<u>0.09</u>
06	1.16	1.58	1.22	<u>0.22</u>	1.31	<u>0.01</u>	0.56
07	1.60	0.62	<u>0.23</u>	<u>0.30</u>	2.77	<u>0.14</u>	0.51
08	0.43	1.06	0.39	<u>0.13</u>	1.94	0.69	0.41
09	1.76	0.47	2.03	<u>0.20</u>	<u>3.02</u>	<u>0.11</u>	0.73
11	2.49	<u>4.85</u>	<u>3.36</u>	<u>0.31</u>	<u>0.18</u>	1.78	<u>0.35</u>
12	1.49	1.18	<u>4.22</u>	0.50	0.97	<u>0.01</u>	0.52

Source: calculated by the authors based on the data in Figure 3~9.

To better visualize the volumes and the directions of food trades, we present the following flow maps for six selected major food types. For each of the food types, the top 14 flows are

shown in a map with arrows: the thickness of an arrow represents the trade volume, which is also listed in the right of the map. Moreover, the total export volume of a food type from a country (to the other NSR countries) is shown with different colours, and the legend of colours can be found in the left-top corner of a map.

In Figure 10, the flows of meat products are fairly distributed among the countries. Compared with the other maps, the volume difference between the meat flows is rather small. The Netherlands has the highest export of meat products.

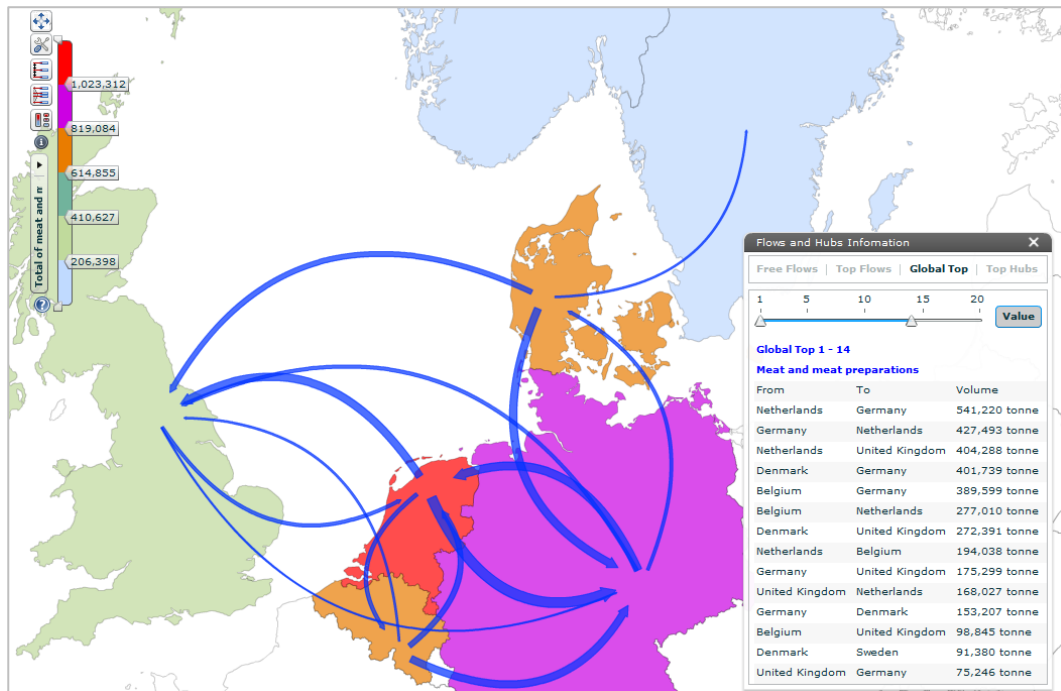


Figure 10. Trade flows of meat products (SITC 01) between the NSR countries

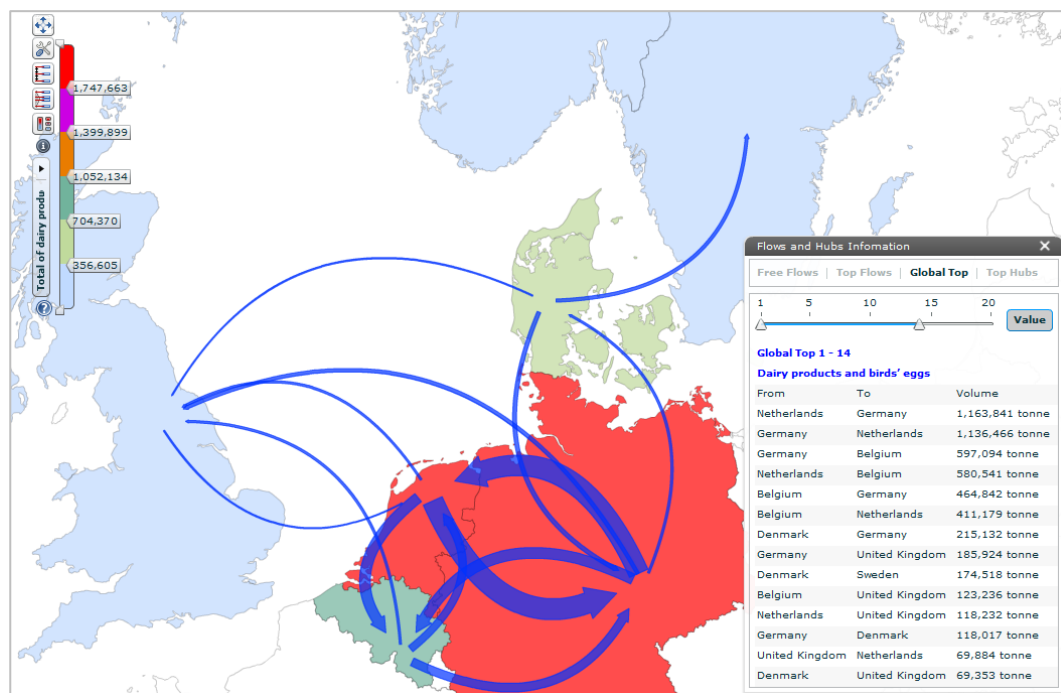


Figure 11. Trade flows of dairy products (SITC 02) between the NSR countries

In Figure 11, the Netherlands and Germany have the highest exports of dairy products, and the trade flows between them are over 1 million tonnes in both directions. Belgium also has big trade flows with these two countries.

As shown in Figure 12, Norway exports much more fish and fish products than the other countries. But the total trade volume is not very high, compared with the other maps. Figure 13 shows the trade flows of cereals, which are in much higher volumes than the above three food types. The biggest single flow (from Germany to the Netherlands) is over 3 million tonnes. Germany exports a lot to the other countries but imports less back (except from Denmark).

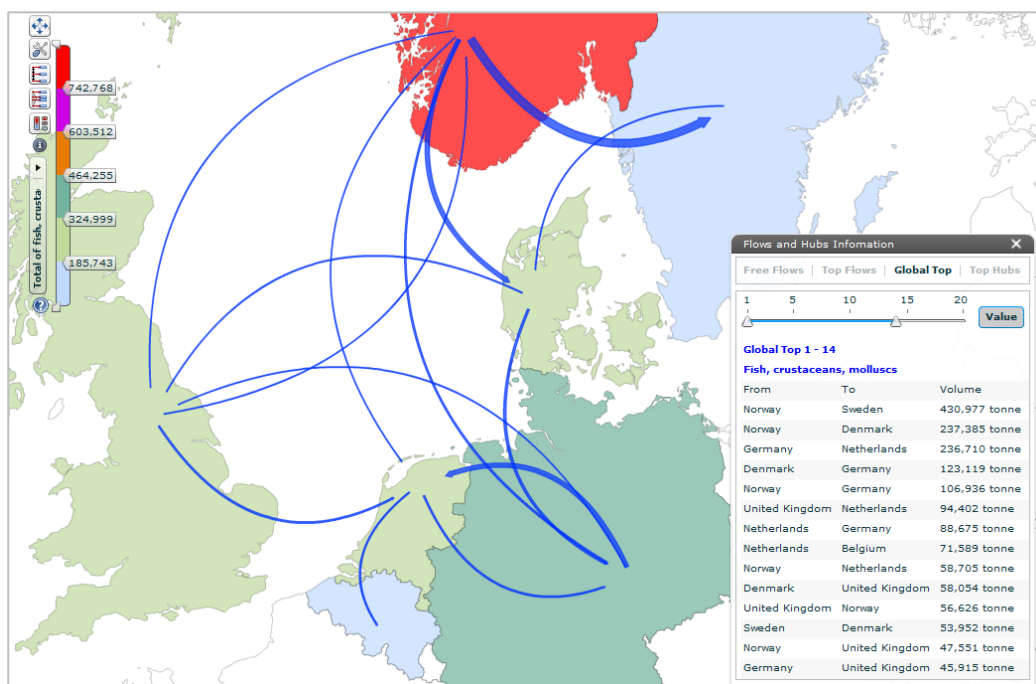


Figure 12. Trade flows of fish products (SITC 03) between the NSR countries

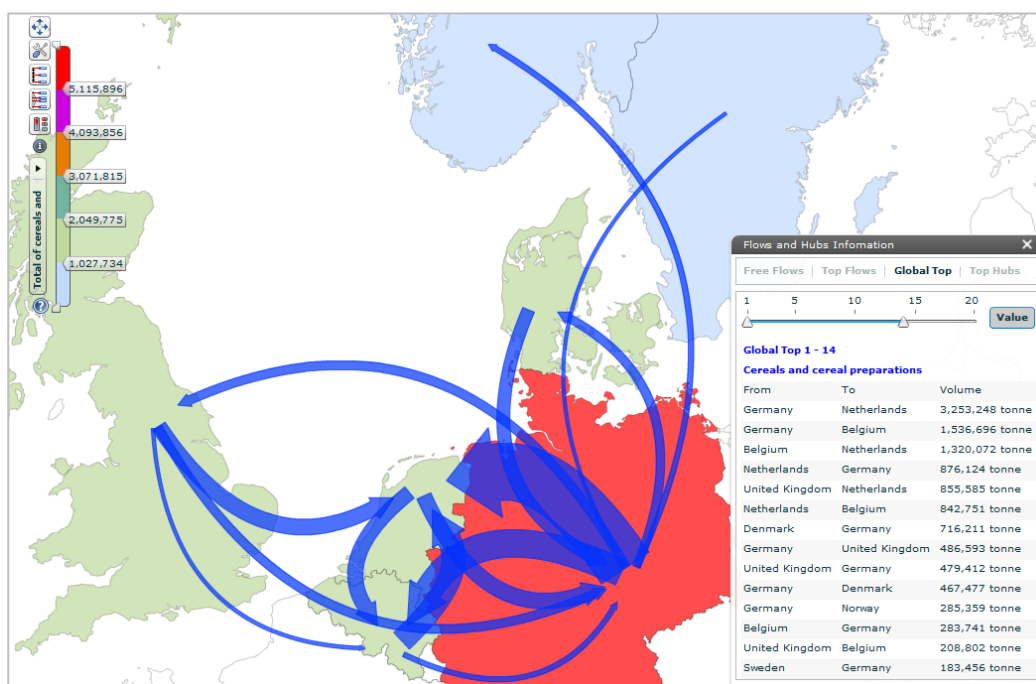


Figure 13. Trade flows of cereals products (SITC 04) between the NSR countries

In Figure 14, the Netherlands exports much more vegetables and fruits than the other countries do. The flows between the Netherlands, Germany and Belgium are in high volumes, especially the one from the Netherlands to Germany is over 3.7 million tonnes. UK imports a lot vegetables and fruits from these three countries. Figure 15 shows the trade flows of animal foods, the total volume of which is as high as the ones of cereals and vegetables/fruits. The structure of flows in Figure 15 looks very similar to the one in Figure 14: the Netherlands is the top countries with highest total export volume, and the biggest flows exist between the Netherlands, Germany and Belgium.

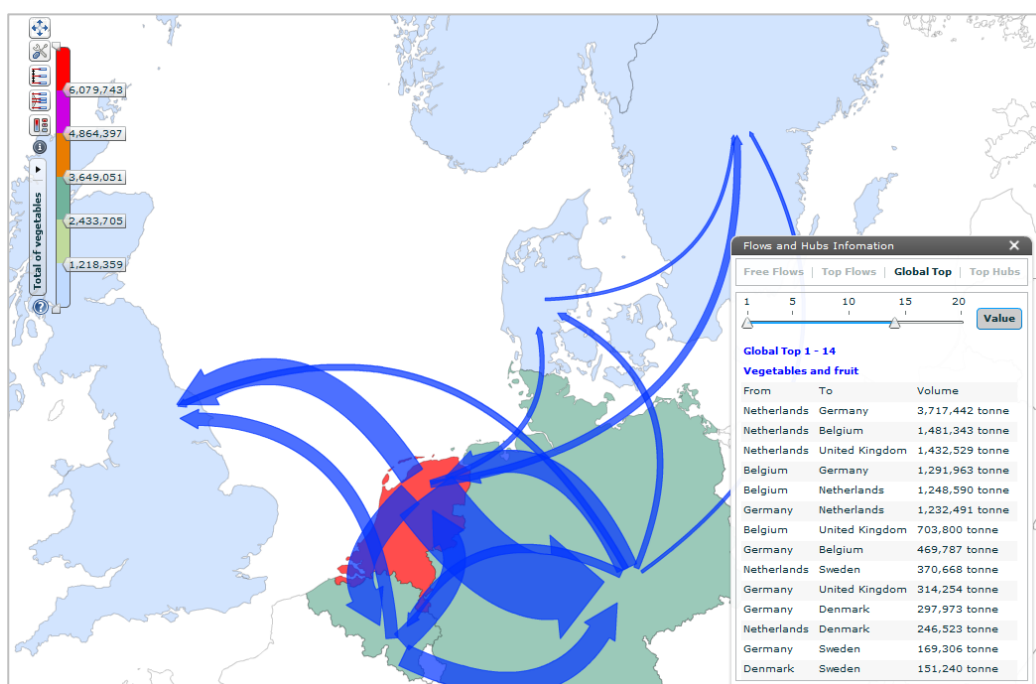


Figure 14. Trade flows of vegetables and fruits (SITC 05) between the NSR countries

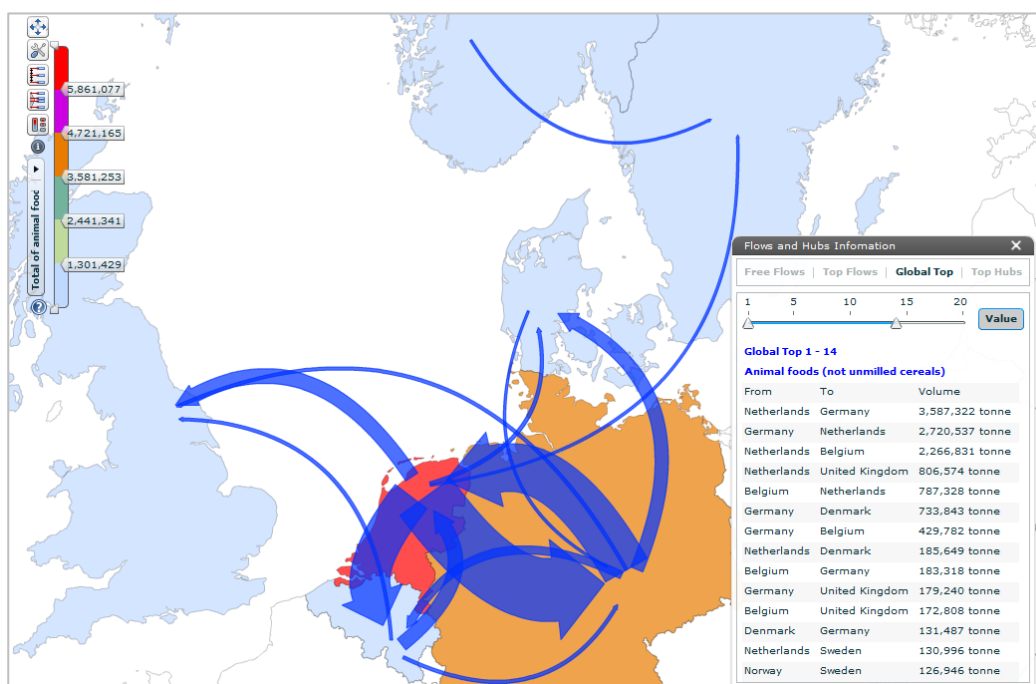


Figure 15. Trade flows of animal foods (SITC 08) between the NSR countries

4 TRANSPORT SERVICE FOR FOOD TRADE

The food trade between the NSR countries requires huge amount of transportation services. According to Eurostat statistics, road transport is dominant for the food trade between the NSR countries, delivering app. 80% of food products (in terms of volume, rather than transportation distance). One reason of the dominance of road transport is flexibility: it is a flexible modal for loading and unloading at any location and provides door-to-door service, although it is not specially economical for long distance transportation. Both water and rail transports are more energy efficient than road transport, so there is a huge potential for switching food transportation from road to water or rail in the NSR countries.

Table 4. Transport modal split for Norway's food trade in 2007 (in 100 KG)

Flow	Partner country	Modal of transport					
		Sea	Rail	Air	Unknown	Road	Post
Norway's food export to	Belgium	7,966	0	99	0	10,716	3
	Germany	547,228	50,065	65	129	42,145	0
	Denmark	4,731,302	0	117	21	566,500	79
	UK	640,772	0	14,701	3,872	0	0
	Netherlands	267,485	0	13	193,392	217,849	0
	Sweden	1,070,170	43,629	87	0	4,934,719	0
Norway's food import from	Belgium	411,006	439	35	0	359,860	0
	Germany	1,653,655	10,575	1,841	103,994	846,999	430
	Denmark	3,692,804	201	20	16,599	1,141,071	432
	UK	1,259,774	699	364	0	50	0
	Netherlands	509,878	31	1,262	0	1,627,888	0
	Sweden	730,686	35,264	23,142	0	2,590,165	0
Modal split		54.7%	0.5%	0.1%	1.1%	43.5%	0%

Note: data source is Eurostat.

For the modal split in individual countries, it is only possible to analyse the case of Norway, because of the limited data availability. As shown in Table 4, Norway has already achieved a high market share of water transportation, up to 55% for import and export foods. This is mainly linked to the geography of Norway – only being connected to mainland Europe through Sweden. Due to data limitation, it is not clear how the modal split are in the remaining NSR countries. But certainly, the average market share of rail and water transportation in the other NSR countries is under 20%.

5 THE FOOD SUPPLY CHAIN IN THE PARTNER REGIONS

The rest of this report is a close investigation of the food supply chains in the partner regions. Chapter 5 focuses on the economic importance of food production, food manufacture, transport/storage, wholesale/retail and food import/export. Chapter 6 addresses the potential transport modal shift and potential benefits of ILC technologies.

The economic importance of food production

In all partner regions, food products are very important for the local economies. Major food sectors include crops, cereals, vegetables, pigs, cattle, sheep, poultry, fish and other seafood. The production and secondary processing of the above products play a significant role in the employment and economies of the regions, especially because many foods are exported. Fishing and fish farming are particularly important for the Nordmøre & Romsdal, Bremerhaven and Scotland. Table 5 highlights the importance of food clusters for each of the regions.

Table 5. The importance of the food industry for the regions

Region	Importance of food produce to the regional economy
Yorkshire & Humber	<ul style="list-style-type: none"> Food and drink manufacturing sector contributes to GVA of around £22.8bn in UK and accounts for 261,392 employees. The amount UK spent on food and drink imports (£32.4bn) is more than twice as much sold on exports (£14.0bn). Prominent agricultural segments are: pigs, poultry (including eggs), Beef (for meat) and dairy (for milk and cheese etc.) and all types of crops and cereals (Barley, wheat, oat, oilseed rape)
West Flanders	<ul style="list-style-type: none"> About two-third of the land is used for agriculture and horticulture (216,000 ha). West Flanders grows 52% of Flemish potatoes and 63% of Flemish open-air vegetables. The delivery and processing of frozen vegetables is important. Pig breeding has a strong presence (55% Flemish), it accounts for one-third of all cattle and poultry. Cattle fodder businesses, slaughterhouses and dairy products processing are vital to both the economy and employment. Offshore fishing sector is an important sector.
Scotland	<ul style="list-style-type: none"> Food and drink sector in Scotland employs 367,713 employees and contributes to £10.126 billion GVA, which is 9.8% of the GVA. Majority of GVA is contributed by manufacturing, warehouse, retail, catering. <ul style="list-style-type: none"> Major produces are: drink (£3 billion of export), meat (6% exported), fish (23% exported) and dairy (mainly for Scotland and the UK) Imported foods are animal feedstuff, seafood, vegetable and fruits.
Västra Götaland	<ul style="list-style-type: none"> Västra Götaland is a leading industrial region where food processing, IT, paper and automotive industries play important parts in the regional GDP. Food industry at Västra Götaland contributes to 20% of the total employment in the Swedish food industry (11,094 employees in 2009). Västra Götaland holds: <ul style="list-style-type: none"> 25 % of Sweden's food production; 50% of Sweden's fishing industry and 75% of Sweden's fish preparation industry, 7 of the 15 largest food production companies 58% of jobs in the fish industry
Møre & Romsdal	<ul style="list-style-type: none"> Annual seafood catches worth NOK 3.2 billion, which is 25% of Norwegian catches. It produces 13% of Norwegian farmed fish (mainly salmon and trout), equivalent to NOK 2.5 billion or 100,000 tonnes of fish. Omegaland produces 40% of the world's omega-3 for human consumption. More than 500,000 tonnes seafood are exported by 120 companies. Road is the most common way to transport export seafood;
Southern Denmark	<ul style="list-style-type: none"> Food industries contribute to roughly 28% of the employment of the region. Agri-food supply chain accounts for 12.6% of the region's GVA for the private sector. Europe's largest dairy cooperative and the world's second largest pork slaughterhouse highly present in the region. 40% of the nations' cattle (for both slaughtering and dairy) are in the region. The region accounts for almost 30% of pigs, 60% of slaughter chickens, 28% of all cereals and 30% of potatoes, over 50% of all poultry of the nation.
Bremerhaven	<ul style="list-style-type: none"> In Germany, agriculture (incl. fisheries) contributed roughly 0.8% to the gross value of the national economy. The food industry employs about 5 million people. German food industry makes every fourth euro on foreign markets. The city of Bremerhaven is the most important fish processing and fish trading centre in Germany. 30% of Germany's employees in the fish and food processing industry work in Bremerhaven. Over 40 % of Bremerhaven's employees work for it. Local university cooperates with local companies in the fish industry, and offers courses in Food Technology and Food Economics.

The agricultural and horticultural sectors

As shown by the SWOT analysis in Table 6, the main strengths of most of the regions are the wide range of food produces, access to R&D, knowledge, technology, and processing facilities. Most regions indicate the lack of intermodal infrastructure, logistics and supply chain skills, visibility as the main weaknesses of the regions. High costs of input, land and logistics and competitions from low-cost producers are the main concern.

Table 6. SWOT analysis for agricultural and horticultural sectors for the regions

Food including crops, cereals, vegetable, cattle, pig, poultry, fish, seafood and aquaculture for all regions	Strengths	Opportunities
	<ul style="list-style-type: none"> Diverse range of food products Strong R&D support & technology Knowledge, experience & reputation Strategic location and close proximity to processing facilities Access to large fish stock Technology and knowledge for fish farming 	<ul style="list-style-type: none"> Building of processing facilities close to ports, logistics hubs & farms Further integration between supply chain links Use of sea and rail freight to reduce carbon footprint & energy consumption Carbon labelling & ILC technologies Logistics & supply chain education
	Weaknesses	Threats
	<ul style="list-style-type: none"> Lack of intermodal infrastructure Lack of logistics & supply chain skills Heavy reliance on road freight - high carbon footprint Lack of visibility of food flows - leading to inefficiency High cost & import of animal feed Industrial concentration leads to high transport cost 	<ul style="list-style-type: none"> High cost of material, transport, energy & environment High cost of land Economic recession Low profitability - close down farms Compete with cheaper import products Changes in agriculture (EU) policies

The food and drinks manufacturing

Since a large proportion of food products need to be further processed in the regions, the manufacturing or processing of food and drinks becomes a very important part of the local economies. This provides opportunities to create added value and new jobs. However, the long-term survival of such manufacturing activities can be a problem, due to the competition from the low cost economies. To support such food clusters, we need more efficient logistics, storage and transport facilities. A SWOT analysis for the manufacturing sector in all the regions is in Table 7.

Table 7. SWOT analysis for food and drink manufacturing for the regions

Food and drinks Manufacturing sectors for the regions	Strengths	Opportunities
	<ul style="list-style-type: none"> Proximity to supply and logistics hubs Diverse range of products Well connected road transport R&D and technology Optimising logistics by large cooperative (Southern Denmark) Modern facilities (Southern Denmark) Cooperative strategies of companies (Bremerhaven) 	<ul style="list-style-type: none"> Use of intermodal infrastructure Improve communication in supply chains Improve collaboration with suppliers and customers (retailers) Secondary processing industry Restructure of the processing industry will need higher skills and technologies (Bremerhaven)
	Weaknesses	Threats
	<ul style="list-style-type: none"> Lack of intermodal infrastructure Old facilities not for modern demand Heavy reliance on road Lack of secondary processing industry Company decisions are not made locally (Bremerhaven) 	<ul style="list-style-type: none"> Competition from low cost economies Increase cost of materials, transport and energy Declining fish stock in some areas New legislation forces large investment (Bremerhaven)

The transport and storage sectors

Transport and storage is a growing industry in all the regions. As shown by the SWOT analysis in Table 8, most of the regions have good road infrastructure, seaports and multimodal logistics hubs. However, frequent and price-competitive sea freight or feeder connections between the regions are missing. Therefore road transport largely predominates the food supply chain. Most regions have already plans for improving intermodal infrastructure, some specifically for food supply chains. In the regions, the transport and storage sectors are made up of many small and medium size companies. There is a trend of consolidation of volumes. This makes the step towards multimodality easier. In the future larger multinational logistics companies will emerge to offer more integrated logistics solutions. The building of intermodal infrastructure and the use of intermodal solutions depend greatly on economic advantage and political decisions, which are perhaps the most significant obstacles of modal shift.

Table 8. SWOT analysis for transport and storage sectors for the regions

Transport and storage sectors for the regions	Strengths	Opportunities
	<ul style="list-style-type: none"> Modern port facilities and well-connected motorways Growing industry with significant potential for value added activities Close to European economy conglomerates Existing storage facilities and firms for chilled and frozen food 	<ul style="list-style-type: none"> Consolidation of service providers across the regions for food supply chain Extension of logistics service to door-to-door services including intermodal solutions e.g. rail and sea freight Building of intermodal with multi-temperature infrastructure
	Weaknesses	Threats
	<ul style="list-style-type: none"> Service providers made up of many small and medium size enterprises Mainly using road transport to meet cost and speed requirement Perceived as not a very attractive industry Shortage of space at ports Short distance not ideal for intermodal solutions 	<ul style="list-style-type: none"> Internal and external competition when it comes to the construction of intermodal facilities High investment low profitability for intermodal service High cost of fuel and low profit threaten survival of SMEs Slow political decision

The wholesale and retail sectors

Regarding the food wholesale and retail in the partner regions, there is an increasing trend of using factory gate pricing and controlling inbound logistics, which means that the decision power on logistic solutions is shifted to large retailers. Another trend is the consolidation of retailers, and most regions will probably end up being served by a few large retailers. For example, the top two retailers in Denmark account for 59% of the grocery market.

Table 9. SWOT analysis for import and export of food for the regions

Import and export of food for the regions	Strengths	Opportunities
	<ul style="list-style-type: none"> Increase in demand for import and export Variety of products from strong agriculture, horticulture, fishery and aquaculture industry 	<ul style="list-style-type: none"> Use of rail and sea freight Use of intermodal infrastructure BIP to be built in strategic ports e.g. Immingham
	Weaknesses	Threats
	<ul style="list-style-type: none"> Heavy reliance on road transport Low usage of rail and coast feeders Lack of specialist equipment and facilities Lack of government investment or support Imbalance of trade 	<ul style="list-style-type: none"> Competition from other low-cost countries Economic recession

The import and export sectors

Export and import of food for further processing is a common phenomenon in today's globalised world. The exports of food produced in the regions are significant contributors to the regional economy and employment. From the SWOT analysis in Table 9, it is clear that there are a lot of import and export activities involving food products across the regions and other parts of the world. However, rail and short-sea feeder is clearly underused. There are thus a lot of opportunities and potential for modal shift.

6 THE POTENTIAL TRANSPORT MODAL SHIFT AND BENEFITS OF ILC TECHNOLOGIES

The potential transport modal shift

In the partner regions, rail and short-sea feeder are clearly underused. There are a lot of opportunities for modal shift. Each identified modal shift opportunity is labelled in Figure 16. To examine the feasibility of these modal shift opportunities, more detail analysis on import/export flows is required. This will be further addressed in work package 3.1 of the Food Port project.



Figure 16. Modal shift opportunities

In Figure 16, (1) rail and coastal shipping could be used instead of road transportation for the transportation from the Central Scotland and Fife to South East England, especially for the increasing demand for Scottish food and drink products on the international market; (2) the food imports from EU to the north UK can be consolidated in e.g. Zeebrugge and then transhipped to Immingham or Grangemouth; (3) the use of ferry services would allow Scottish fish products to reach EU market directly, and retail imports on the opposite direction as well; shipping service could also be used for transporting fish on other routes; (4) in West Flanders the sector of potatoes and vegetables (both fresh and frozen) can be shifted to rail and (short-sea) shipping; (5) in Västra Götaland, the dry port system opens up opportunities to move goods to intermodal systems; (6) the Nordmøre/KNH region is planning a new port for food exports at Justen Island in Hitra municipality, especially for fresh fish and seafood; (7) existing shipping lines could be used for transportation between Esbjerg (Southern Denmark) and the UK.

The potential benefits of ILC technologies

Regarding the ILC technologies, its application would provide supply-chain visibility, flexibility, agility and cost reduction, and service improvement for food production, transportation and logistics in the partner regions. Some options for applications are fresh seafood, fresh meat, fruits, frozen seafood and general chilled/frozen food.

7 CONCLUSION

This report summarises a market scan as the first step to enhance market knowledge of the food supply chain at the North Sea Region (activity 5.1) under the work package 5 (Enhancing market knowledge) of the Interreg IVB NSR Food Port project. The market scan includes of the following regions:

- Yorkshire & Humber, England
- Scotland
- West Flanders, Belgium
- Västra Götaland, Sweden
- Møre & Romsdal County (incl. Nordmøre and KNH region), Norway
- Southern Denmark, Denmark
- Bremerhaven, Germany

The above regions vary greatly in terms of land area, population, employment but share some similar features in term of agriculture, horticulture, fishery, aquaculture, food processing and distribution. As far as the economy is concerned, all the regions contribute significantly to the economies of the respective countries, and the food and drink sector is one of the most important sectors.

This report identifies the following as the most important food product groups for the Food Port project and the North Sea Region: crops, cereals, potatoes, vegetable, pigs, cattle, sheep, poultry, dairy, fisheries and aquaculture (salmon, cod, herring, etc.), food processing which are closely related to the agricultural, horticultural, fishery and aquaculture products.

The food trade between the NSR countries is analysed. The total volume reached 70 million tonnes in 2010, which accounts for 23% of the total food production in these countries. The trade balance of individual food type is examined for each NSR country. Trade imbalance is observed for many food types in these countries, for example fish.

The transport modal split is also investigated, showing that road transport is dominant for the food trade between the NSR countries, delivering 80% of food products (in terms of volume, rather than transportation distance). Therefore, there is a huge potential for switching international food transport from road to water and rail in these countries. The report thus helps to identify opportunities for modal shift, efficiency improvement and the use of green corridors especially for fishery products (for secondary processing and exports, fresh, chilled and frozen), horticultural products (pigs, cattle, sheep, poultry, etc.), agricultural products (dairies, cereals, oils, potatoes and vegetables) and beverage.

Lastly, the data issue is mentioned several times in this report. Since all the above analysis is conducted based on data collected from existing database and official statistics, data availability is an important issue in this report. Various international and regional organizations – such as the individual national statistic departments, the OECD, and Eurostat – have long-established programs for collecting food trade data. However, the unavailability of detailed data is still an obstacle for conducting a complete analysis on food trade in the NSR region. For example, the analysis on food production and related transportation services could be further elaborated, if more data were available.



**The Interreg IVB
North Sea Region
Programme**



European Union



The European Regional Development Fund