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The Case of Hedmark-Dalarna (Norway-Sweden) – Regions and Innovation: Collaborating Across Borders

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ABSTRACT

Hedmark County (Norway) and Dalarna County (Sweden) are both rural, with the border being remote from regional centres. The total population of less than half a million inhabitants spans across almost 58 800 km², with an economic output of USD 22 billion. Efforts to support collaboration at the border focus on the sector of tourism that both share, and which would be facilitated by the construction of one airport to serve both sides. As most science and technology-related assets are located far from the border, the region does not seem to have the relevant conditions for a broad cross-border regional innovation policy since urban centres are perhaps better served by looking towards other locations rather than this border. On the border, efforts for innovation in other forms, such as in marketing and organisational methods in tourism, are more relevant. This case study is part of the project *Regions and Innovation: Collaborating Across Borders*. A summary of this working paper appears in a report of the same name.

JEL classification: R11, R58, O14, O18, O38, L52, L53

Keywords: regional development, regional growth, innovation, regional innovation, regional innovation strategy, science and technology, cross-border, Norway, Sweden, Hedmark County, Dalarna County

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EXECUTIVE SUMMARY

Strengths, weaknesses, opportunities and threats for innovation policy in the cross-border area

Strengths/assets	Weaknesses/barriers
• Cultural and linguistic proximity • A common specialisation in tourism activities and some potential in forestry-related industries • Attractive and pristine natural areas • Presence of knowledge and support institutions oriented towards regional specialisations • Cluster policies to develop new knowledge-based niches of activities	• Long distances and lack of infrastructure, limiting accessibility between regional centres • Minimal potential for joint knowledge-based activities at the border • Imbalance in wage levels and currencies that impede cross-border collaboration • Depopulation and aging due to outmigration of youth • Limited presence of dynamic and knowledge-intensive small and medium-sized enterprises • Cross-border co-operation limited to public actors with weak involvement of private stakeholders (apart from the tourism industry) • Weak cross-border cluster co-operation
Opportunities	**Threats**
• Growth of the nearby Oslo region • Unique global brand for tourism based on sports, health and green assets • Openness to cross-border co-operation with more knowledge-intensive areas in Inner Scandinavia (such as Akerhus and Värmland counties)	• Competitiveness of traditional industries in high-wage countries • International (and national) competition in tourism destinations; rivalry of respective national tourism promotion

Hedmark (Norway) and Dalarna (Sweden) are two bordering rural counties. The area is characterised by unspoilt natural areas, several small municipalities and towns, and no major urban hubs (470 000 inhabitants in total). The question for the cross-border area is whether the current joint co-operation opportunity around tourism provides the basis for a broader co-operation to promote knowledge-intensive products and services.

The profile and relevance of the Hedmark-Dalarna cross-border area for innovation

Hedmark-Dalarna cannot be considered a functional region for innovation. While socio-cultural proximity is relatively high, the long distances are a barrier for the development of common economic activities. Connections between the central towns of the two counties are made difficult due to distance, limited infrastructure and lack of public transport. Cross-border commuting and trade flows are also limited, and interactions between the two counties are predominantly among the very sparsely populated border municipalities. The two regions have a common specialisation in tourism and forestry at the border. However, knowledge-based activities are located much farther from the border, are different on each side, and offer limited potential for innovation-related synergies.

Beyond tourism, and potentially the forestry industry, cross-border co-operation opportunities are found at the level of Inner Scandinavia or beyond, rather than between Hedmark and Dalarna exclusively. Hedmark and Dalarna – as high-wage regions specialised in industries based on the primary sector and with a relatively large public sector – are challenged to diversify into competitive knowledge-intensive activities. The region is not a knowledge hub within the OECD, but there are on-going innovation activities on both sides of the cross-border area, principally in the main towns. In both counties, cluster policies are in place to support the diversification of the economy away from capital-intensive industries. The industries which have most innovation potential (e.g. bioenergy, biotechnology, energy efficiency) are still small and their connections are mostly with actors located outside of the cross-border area. The reality of these connections indicate that accessibility and opportunities may make more sense for Hedmark with the booming Oslo region to the south, and in some cases to key actors in Värmland across the border to the south. For Dalarna, there are also perhaps greater accessibility and innovation-related collaboration with actors in its Swedish neighbour to the south, Värmland. Given distances for some communities at the northern edge of both counties, collaborations with northern neighbours for innovation-related opportunities may also be considered. Greater internal connections of different parts of Inner Scandinavia therefore help the wider region as a whole. Within the Hedmark-Dalarna cross-border area, there are benefits from economies of scale to be reaped in the tourism industry through joint branding and infrastructure (the possible construction of a new airport) but the footprint of this co-operation – the border mountain area – is only a small part of the two counties.

Driving force and key actors for the Hedmark-Dalarna cross-border area

Local actors see mutual benefit in building critical mass and improving accessibility to the ski destination lying at the border. The impetus for formal cross-border co-operation was the TRUST ("Growth and Regional Development in Scandinavia Together") project in 2008, which centred on the removal of border obstacles impeding the mobility of people and firm interactions and improving external accessibility. This focus applies particularly to the tourism industry and the natural areas located along the border.

The establishment of a cross-border effort is driven by the local and regional authorities, not by the private sector. The two counties identified the relevance of addressing border obstacles and economies of scale in tourism jointly. Businesses and business support organisations play a limited role in the cross-border co-operation, except for the tourism industry with Skistar, the large Swedish firm managing the ski resorts in both counties. Its interest in having a better infrastructure (airport) for accessing the area is obvious. Other tourism firms tend to be very small and are only focused on the local market and are not yet in a position to market their offer to a wider clientele. However, they can exploit linkages with larger firms in the tourism sector to develop higher-end products.

Co-operation among higher education institutions (HEIs) goes beyond the cross-border area. The small university colleges located in the region have an interest in developing research linkages with larger universities, located outside of the area. Because of their orientation towards regional specificities, they have, however, developed some joint activities in distance learning and in connection with the needs of the tourism industry.

Governance of the Hedmark-Dalarna cross-border area

Cross-border collaboration between Hedmark and Dalarna counties has a short history. Some border communities in Sweden have had a longer collaboration with Hedmark, dating back to 1995. However, it was only in 2008, with the TRUST project, that broader regional co-operation took off. Prior cross-border efforts were less formalised and at a smaller scale. TRUST broadened the scope of collaboration from border municipalities to the county level and had the specific goal of strengthening the institutional linkages between the two counties. The programme period 2008-12 was the real starting phase

of Hedmark-Dalarna cross-border collaboration, culminating in the creation of the Border Committee in 2012 that provides a structural basis for this collaboration.

The Border Committee provides a focal point for cross-border co-operation, but it has a marginal role in the institutional landscape of the two regions. Its mandate remains very generic and there is no integrated action plan for co-operation between Hedmark and Dalarna. The business development departments of the two counties lack the remit and resources to develop joint actions and policies to support the vision endorsed by the Border Committee. Hedmark-Dalarna co-operation does not appear in the regional development plans of either county; however, the plans share a priority focus in the tourism sector.

Funding sources for cross-border projects are mostly public, from the Nordic Council of Ministers and the European Union. The structural work of the Border Committee is funded by local authorities and the Nordic Council of Ministers. Projects are essentially funded by European Territorial Co-operation (Interreg) programmes (matched by national Norwegian co-funding). No cases of private sector funding for cross-border activities were reported. National and regional funding sources, targeting notably cluster development, cannot cross borders.

Hedmark-Dalarna cross-border innovation policy mix

No cross-border policies cover Hedmark-Dalarna, there are only a few projects funded by the European Territorial Co-operation (Interreg) programme. These are forums and demonstration platforms in domains such as green energy (FEM project), the tourism sector (SITE) or at the intersection between the two sectors (GREEN 2020).

Recommendations for cross-border innovation policies in Hedmark-Dalarna

Achieving economies of scale and solving accessibility issues in the tourism sector are relevant goals that could be complemented by a distinctive "sports, health and green" offer. Given the competitive pressures on tourism industries worldwide, it seems appropriate that the areas in Hedmark and Dalarna join their assets to develop an offer that is marketed internationally. Improving external accessibility is necessary for developing the industry. Forward-looking cost-benefit studies, complemented by risk analyses, should inform the stakeholders on the feasibility of an international airport in the vicinity of this touristic area. This connectivity issue is not the only one to be solved. The marketing of a distinctive image, based on unique assets and innovative products and services, is essential for this high-cost tourism area to be competitive. Several actors, notably the university colleges, could participate in upgrading skills and the innovative potential of the sector.

Cross-border co-operation opportunities appear to be limited in other sectors; therefore pursuing them requires that the benefits outweigh costs. Actors from the construction and timber industry have mentioned some potential for co-operation, albeit some key actors may be located in other nearby counties. Teknikdalen and Tretorget (respectively a Swedish entity focusing on SMEs and innovation and a Norwegian agency promoting innovation in the wood processing sector in Hedmark) could play a central role in exploring other sectors and the possibility of joint use of specialised coaches. Further collaboration possibilities between the university colleges, in the area of lifelong and distance learning in particular, makes sense, again in a broader context than the two counties, given the large geographical distances between urban centres in the two regions. Joint services that address common challenges of these peripheral and sparsely populated areas (e.g. in the health sector), may be another useful area for exchanges, and possibly further development of joint innovative services between the two counties.

Cross-border area: For innovation partners, consider neighbouring Norwegian and Swedish counties of Inner Scandinavia, notably to the south

- Tourism co-operation at the smaller scale of the border municipalities makes sense.
- Promote proximity innovation co-operation activities outside of the tourism sector with relevant partners beyond Hedmark-Dalarna, notably to the south.

Governance: Expand the governance frameworks to include non-public actors ("triple helix") for innovation co-operation, with project financing from existing national programmes

- Associate private and knowledge actors in cross-border governance in a broad sense.
- Allow for cross-border funding in national programmes such as Vinnväxt (Vinnova, Sweden) or Arena (Innovation Norway), subject to demonstration of cross-border value-added.

Innovation policies and instruments: Explore joint cross-border initiatives of mutual benefit and where benefits outweigh costs

- Explore the relevance of joint activities of knowledge parks and innovation intermediaries (Innovation Centre Hedmark, Teknikdalen).
- Explore joint activities in distance learning and joint education, particularly in tourism and forestry-related industries.

INTRODUCTION

Cross-border collaboration between Hedmark and Dalarna has a short history. Compared to other cross-border areas in the European Union, the collaboration between the two bordering counties of Dalarna in Sweden and Hedmark in Norway is quite recent (less than a decade). Collaboration efforts began in the 1990s, on a limited scale, between the municipalities at the border with a focus on tourism. For example, the closest Swedish border municipalities, Älvdalen and Malung/Sälen, have a longer history of co-operation with Hedmark, dating back to 1995, through the European Commission's Interreg 2A programme. It was only in 2008 that broader cross-border regional co-operation took off. The TRUST ("Growth and Regional Development in Scandinavia Together") project broadened the scope beyond the border municipalities and had the specific goal to strengthen the institutional linkages between the two counties. The period 2008-12 was the real starting phase of Hedmark-Dalarna cross-border collaboration, and ended with the creation of the Border Committee in 2012, providing a structural basis for this collaboration. Cross-border co-operation has so far been focused on practical border issues rather than on innovation activities.

The young Border Committee is in search of a vision. Local actors identify a mutual interest in building critical mass and improving accessibility to the ski destination along the border. The question for the cross-border area is whether the current joint co-operation opportunity around tourism provides the basis for broader co-operation to promote knowledge-intensive products and services.

CHAPTER 1

THE HEDMARK-DALARNA CROSS-BORDER AREA AS A FUNCTIONAL REGION

Table 1.1. **Snapshot of the functional region for innovation**

(Hedmark-Dalarna in bold)

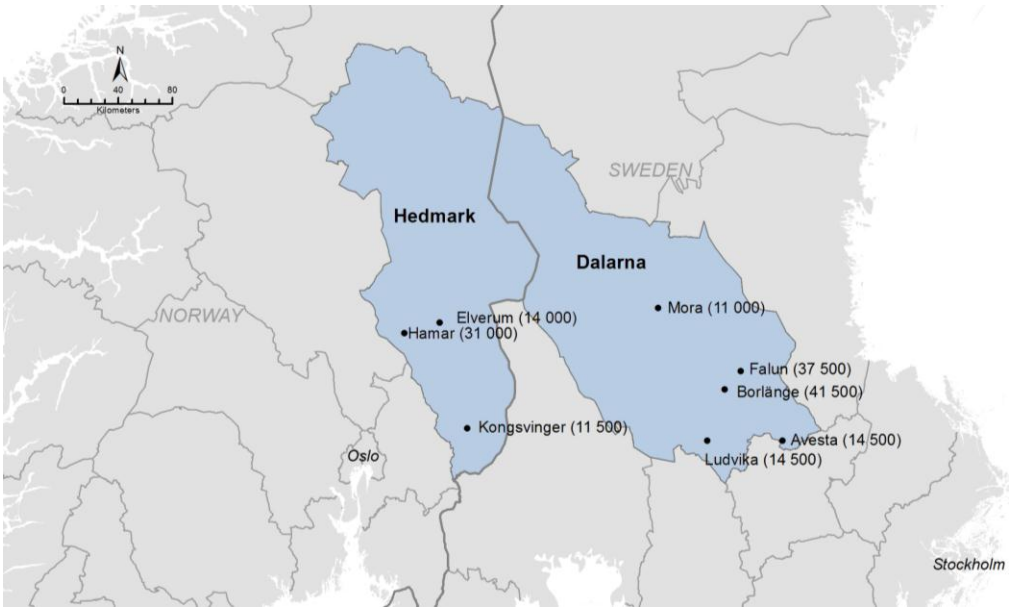
Characteristic	Specification	Comments
Region settlement patterns	Metropolitan area Network of small and medium-sized cities **Sparsely populated with small towns**	The two counties are sparsely populated with a few small towns.
Internal accessibility and flows (geographic proximity)	Strong Moderate **Weak**	The connection between the two main centres of the counties is made difficult due to geographic distance and poor infrastructure (roads and public transport).
Industrial and knowledge specialisations (cognitive proximity)	Similar with complementarities Same **Different**	The two regions have a common specialisation in nature-based tourism at the border, and in forestry and wood processing. However, knowledge-based activities are located much further away and are in different sectors.
Socio-cultural context (social proximity)	**Very similar** Somewhat similar Different	This cross-border area has a similar socio-cultural context, even if national differences in business culture exist.
Innovation system interactions	Pervasive Hub-to-hub **On the border**	Cross-border interactions are limited to the border municipalities, specialised in the tourism industry.
Level of innovation development across border	Balanced, strong **Balanced, weak** Unbalanced	Neither region is an OECD knowledge hub, nor are they specialised in primary sector-based activities. On both sides, knowledge-based firms and clusters are emerging, albeit not with cross-border linkages.

1.1. Spatial definition of the cross-border area

Hedmark-Dalarna is formed by two rural counties, separated by a mountain range, along the Norwegian/Swedish border. The cross-border region includes one Swedish county, Dalarna, and one Norwegian county, Hedmark, of similar size and population (Figure 1.1). The two counties are sparsely populated (8 inhabitants/km²). Their main centres, Borlänge and Falun on the Swedish side and Hamar on the Norwegian side, are small towns located at some distance from their respective capital cities, 200 kilometres and 120 kilometres respectively. The mountain range, the absence of densely populated areas along the border and the distance between the main centres explain the poor transport connections between the two counties.

Hedmark-Dalarna is part of the larger "Inner Scandinavia" cross-border region defined by European Territorial Co-operation (Interreg). This larger region includes, in addition to the two counties, the county of Värmland, south of Dalarna (Sweden) and the counties of Akerhus (Oslo) and Østfold, south of Hedmark (Norway) (Figure 1.2).

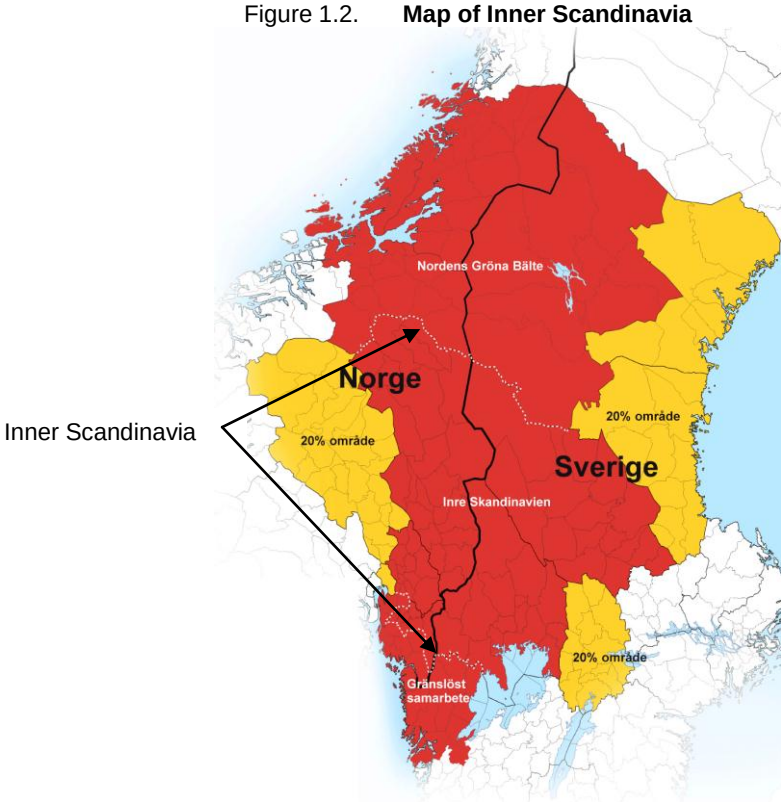
Figure 1.1. **Map of the Hedmark-Dalarna cross-border area**



Note: This map is for illustrative purposes and is without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

Source: Hedmark-Dalarna Border Committee (2013), "Cross-border regional innovation policies between Hedmark and Dalarna: Background Report for the OECD", January.

Figure 1.2. **Map of Inner Scandinavia**



Note: This map is for illustrative purposes and is without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

Source: www.interreg-sverige-norge.com.

1.2. Key economic characteristics of the cross-border area

Hedmark and Dalarna are small regions sharing similar economic characteristics. Totalling less than a half million inhabitants combined, they are both small counties in their national context, and provide a limited contribution to national wealth. Dalarna accounts for 2.5% of Sweden's GDP and Hedmark for 2.9% of Norway's GDP (2009). The corresponding population figures are 3% and 4%, indicating that these regions contribute less than their share to national production (Table 1.2). This lagging performance in a national context reflects several factors, such as an ageing population and a specialisation in sectors with relatively low added-value and growth rates in their national context.

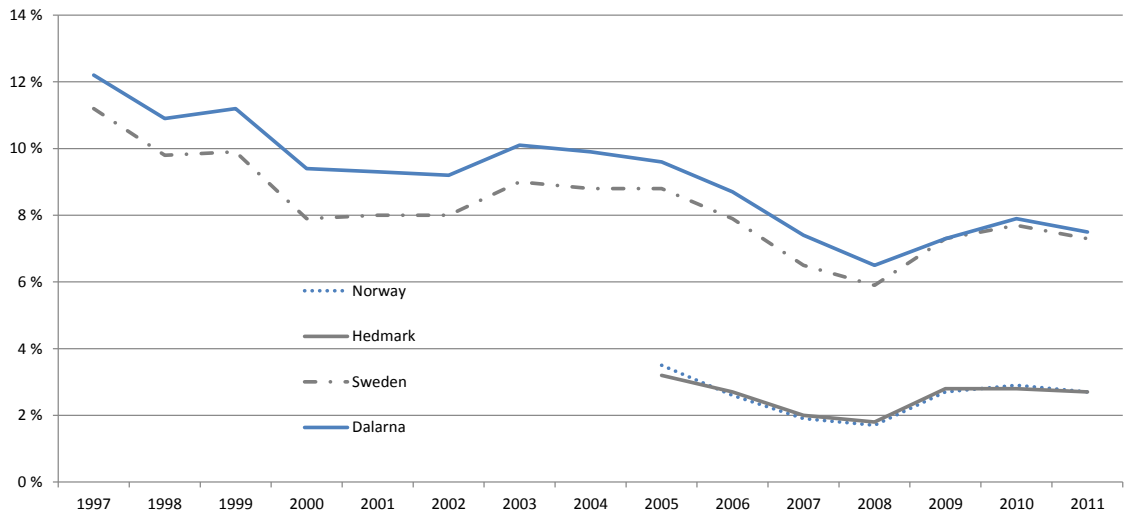
Table 1.2. **Socio-economic overview of the cross-border area**

Variable	Total	Hedmark	Dalarna
Km²	57 796	27 398	30 398
Population (2012)	469 356	192 791	276 565
Population density (inhabitants/km²)	8	7	9
Main cities		Hamar	Falun and Börlange
Unemployment rate (2011)		2.7%	7.5%
Employment rate (2011 Norway; 2010 Sweden)		76%	77%
Share of national GDP (2009)		2.9%	2.5%

Source: Hedmark-Dalarna Border Committee (2013), "Cross-border regional innovation policies between Hedmark and Dalarna: Background Report for the OECD", January.

The labour market situation in both regions has a favourable outlook for the future. Employment rates are similar and exceed the EU's 75% target. Unemployment rates deviate little from national averages and show a long-term decline (Figure 1.3). These rates are, however, much higher in Sweden than in Norway, the latter displaying extremely low unemployment rates, even after the 2008-09 crisis.

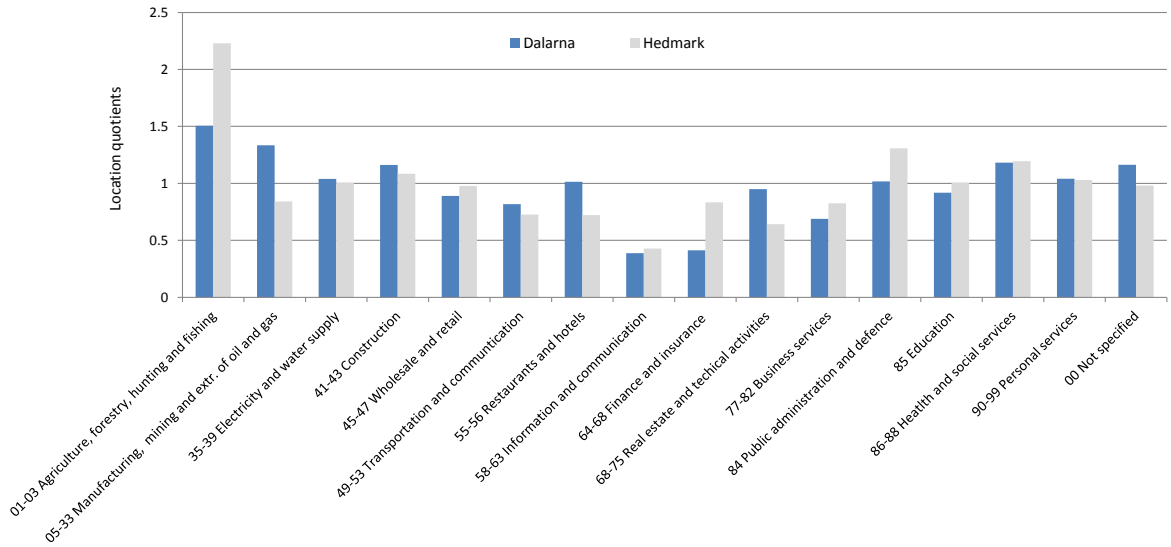
Figure 1.3. **Evolution of the unemployment rate in Hedmark-Dalarna**



Source: Hedmark-Dalarna Border Committee (2013), "Cross-border regional innovation policies between Hedmark and Dalarna: Background Report for the OECD", January.

Hedmark and Dalarna are rural regions challenged to diversify into competitive knowledge-intensive activities. Both counties are rural with industrial activity derived from the primary sector (9% and 18% of employment respectively in Hedmark and Dalarna). Forestry and farming are important primary sector activities in Hedmark, connected to wood processing and food industries. Dalarna hosts large companies in steel, forestry and power generation. The tourism industry is present in both counties, although this sector does not show up in the figures for specialisation rates (Figure 1.4). In both counties, although more so in Hedmark, traditional industries, tourism and primary sector economic branches face competitiveness threats due to the high wage levels. Both counties also share a relatively large public sector including education and health services. Both counties are challenged to develop internationally competitive goods and services with a potential for job creation.

Figure 1.4. **Economic specialisation of Hedmark and Dalarna**



Source: Hedmark-Dalarna Border Committee (2013), "Cross-border regional innovation policies between Hedmark and Dalarna: Background Report for the OECD", January.

The firm structure differs between the two counties, with Dalarna hosting more multinational firms than Hedmark, which is home mainly to SMEs. Stora Enso is the largest, foreign-owned company active in Dalarna, in a country known for its large firms. Hedmark hosts nationally owned companies such as Moelven in the building industry and subsidiaries of larger companies active in the food industry with headquarters in Oslo. In contrast to Dalarna, most of the companies in Hedmark are small firms.

Hedmark and Dalarna share a tourism and ski area along the border. Dalarna is the third tourism destination in Sweden, behind Stockholm and Göteborg. The ski area in Hedmark is the largest in Norway. The combined cross-border ski area is significant in a Scandinavian market perspective. The cross-border region offers a large natural area with good possibilities for outdoor activities, in relatively close proximity to Oslo. However, the tourism industry is fragmented in both counties. The challenge is to develop it into an internationally competitive destination, which requires upgrading the capacity of the small operators (Box 1.3).

Dalarna, and to a lesser extent Hedmark, face the demographic challenge of an ageing population. This demographic challenge is more pronounced on the Swedish side, where the population is shrinking due essentially to ageing and outward migration, especially of young people (Sahlander, 2013). However, in Hedmark aging trends are compensated by a positive inward migration trend (especially

foreign immigrants), resulting in a 4% population increase from 1997 to 2012. During the same period, Dalarna faced a 4% decrease in population, due to negative net migration and low replacement rates. The projections for Hedmark are positive with expected inward migration due to the favourable conditions of the Norwegian economy and the proximity of the growing capital region, Oslo.

1.3. Innovation potential of the cross-border area

Both counties are specialised in non-R&D-intensive activities. Due to specialisation in low- and medium-tech industries, total R&D and patenting propensity figures in the two counties are much lower than their respective national figures. In line with these specialisations, the level of tertiary education of the labour force is significantly lower than national averages and that of the majority of other regions in the respective countries (Table 1.3). There is a difference between the two countries in terms of business R&D, which is reflected in regional figures, as large Swedish firms invest in R&D more than the smaller Norwegian firms.

Table 1.3. **Innovation overview of the cross-border area**

Variable	Hedmark	Norway	Dalarna	Sweden
Tertiary educational attainment as a share of labour force (2011)	24%	32%	28%	36%
Share of employment in high- and medium-tech manufacturing and services) (2011)	2.4%	5.6%	2.8%	7.3%
Total R&D expenditure as a share of GDP (2009)	0.4%	2.5%	0.7%	3.6%
Business R&D expenditure as a share of GDP (2009)	0.15%	1.1%	0.5%	2.45%
Share of R&D by private sector	42%	43.5%	68%	70.4%
PCT patents per million inhabitants (2008-10)*	88	433	387	929

Note: * Data for Hedmark and Oppland, and Värmland, Dalarna and Gävleborg.

Source: OECD (2013), *OECD Regional Statistics* (database), doi: 10.1787/region-data-en and Hedmark-Dalarna Border Committee (2013), "Cross-border regional innovation policies between Hedmark and Dalarna: Background Report for the OECD," January.

There is potential for forms of innovation that are less R&D intensive, related to rural industries. Innovation processes in rural areas often focus on incremental innovations. Such innovations are new to firms or institutions in a specific area or market, in contrast with radical innovations that are new to the world (Box 1.1). Non-R&D innovation, like organisational or marketing innovation, is particularly relevant for the tourism sector.

Box 1.1. **Types of innovation: The OECD definition**

The *OECD Oslo Manual* identifies four types of innovation: product, process, marketing and organisational.

Type of innovation	Definition
Product innovation	A good or service that is new or significantly improved. This includes significant improvements in technical specifications, components and materials, incorporated software, user friendliness and other functional characteristics.
Process innovation	A new or significantly improved production or delivery method. This includes significant changes in techniques, equipment and/or software.
Marketing innovation	Significant changes in product design or packaging, product placement, product promotion or pricing.
Organisational innovation	A new organisational method in the firm's business practices, workplace organisation or external relations.
Degree of novelty	Each type of innovation can be new to the firm/institution, to the market/sector or the world.

Box 1.1. **Types of innovation: The OECD definition** (*cont.*)

The OECD Innovation Strategy capitalises on the experience in measuring innovation in OECD member countries and highlights a series of key issues for improving existing metrics:

- **Intangible assets:** Innovation results from a range of complementary assets beyond R&D, such as software, human capital and new organisational structures. Investments in these intangible assets is rising and overtaking investment in physical capital (machinery and equipment) in Finland, Sweden and the United States for example.
- **Innovation goes beyond R&D:** Innovation embraces a range of complementary assets that go beyond R&D, such as software, human capital and new organisational structures. Firms may introduce new products on the market without engaging in R&D. For example, in Australia and Norway the propensity to introduce new-to-market product innovation is similar whether or not the firm performs R&D.
- **Mixed modes of innovation:** Firm-level innovation data reveal complementary strategies. Terms such as "technological" or "non-technological" innovation are simplifications and to some extent misleading. Most innovative firms introduce both product and process innovations, as well as marketing or organisational innovations. This is true for firms in both manufacturing and services. There are, of course, differences by sector and firm size. For instance, a larger share of firms in services than in manufacturing introduce only marketing or organisational innovation.
- **Collaboration and networks are essential:** Firms that collaborate on innovation spend more on innovation than those that do not. This suggests that collaboration is likely to be undertaken to extend the scope of a project or to complement firms' competences more than to save on costs. In most countries, collaboration with foreign partners is at least as important as domestic co-operation. Collaboration is used in innovation processes whether firms perform a lot of R&D, a little R&D or no R&D at all. In this respect, policies that stimulate collaboration and network initiatives will have an impact on the entire spectrum of innovative firms. Increasing collaboration is also observed in the sciences. Production of scientific knowledge is increasingly shifting from individuals to groups, from single to multiple institutions, and from national to international arenas.
- **Convergence of scientific fields and multi-disciplinary/interdisciplinary research:** Using "science maps", there is evidence that increasingly, innovations are achieved through the convergence of scientific fields and technologies. For example, nanoscience research has arisen from the interaction of physics and chemistry and is interdisciplinary in character. Environmental research is one example of multi-disciplinary research. This requires creating spaces for interaction and cross-fertilisation of different knowledge domains.

Source: OECD (2011), *Regions and Innovation Policy*, OECD Publishing, http://dx.doi.org/10.1787/9789264097803-en, based on OECD (2010), *Measuring Innovation: A New Perspective*, OECD Publishing, http://dx.doi.org/10.1787/9789264059474-en; OECD/Statistical Office of the European Communities, Luxembourg/European Union (1997), *Proposed Guidelines for Collecting and Interpreting Technological Innovation Data: Oslo Manual*, The Measurement of Scientific and Technological Activities, OECD Publishing, http://dx.doi.org/10.1787/9789264192263-en.

Knowledge institutions are small but focused on regional specialisations. Both Hedmark and Dalarna have a university college. These are small institutions that perform both teaching functions and research activities. Their activities are quite closely linked to the industrial specialisation of the two regional economies. Dalarna University College is specialised in education for workers in the tourism industry, resulting in the development of the Dala Sports Academy. Hedmark University College has developed a Centre for Practice-based Educational Research and has extensive co-operation with different municipalities in the region. Both university colleges are engaged in distance-learning activities. Research areas at Dalarna University College are: energy, forests and built environments; health and welfare; complex systems – microdata analysis; culture, identity and representations; steel forming and surface engineering; and education and learning. The Hedmark University College focuses its research on: applied ecology; biotechnology; business and management; public health; education and diversity; culture and languages (Hedmark-Dalarna Border Committee, 2013).

Innovative firms and clusters are present in both counties, but not at the border. Neither Hedmark nor Dalarna can be qualified as a knowledge hub. There are a number of active innovators, generally concentrated in the main towns that are located far from the border. Due to a lack of available data, it is not possible to assess the level of innovation activities of small firms at the border between the two counties. In both counties, cluster policies are in place to support the diversification of the economy away from large capital-intensive industries.

In Dalarna, innovating firms have formed clusters, together with knowledge institutions, and are supported through a regional cluster programme. Some of the clusters gather world-class leaders, such as Triple Steelix. This cluster in the steel industry run by Region Dalarna and Region Gävleborg includes large companies in niche markets co-operating with universities across Sweden and beyond. Other clusters have a more local focus. Destination Dalarna is a cluster in tourism gathering 1 000 small firms in the county and partnering with Dalarna University. The Dala Sports Academy focuses on local firms in the sports and health industry. ITS Dalarna gathers companies in the field of intelligent transport systems. High Voltage Valley is a cluster of firms and knowledge institutions active in power transmission. Dalabit is an industry cluster in timber and the construction industry. Boomtown is a cluster in rock music, focusing on education. Dalarna is co-operating with two neighbouring Swedish regions on cluster policy in the framework of the SLIM programme (Box 1.2).

Box 1.2. **SLIM, good practice in cluster policy in Northern Central Sweden**

The Swedish SLIM project (System Management for Innovative Platforms and Cluster Organisations in North Mid Sweden) was developed by the counties of Värmland, Dalarna and Gävleborg. It was a winner in the 2011 EU Regiostars contest for the most successful projects using EU Structural Funds. The 15 SLIM clusters are located in traditional industries, in a peripheral region. The project focuses on developing open innovation platforms, common research agendas, common educational agendas and fostering university-business co-operation in the fields where clusters are active.

SLIM is an innovative initiative. It is not limited to promoting clusters and cross-cluster interactions; it also develops competences and learning on clusters management and policy. To this end, it creates synergies between all regional actors: large and small businesses, universities, training institutes, and the local and national policy communities. SLIM produces a corpus of practice-based knowledge and puts it at the disposal of the regional clusters. This knowledge is based on regular and independent evaluations of the cluster impacts on companies, looking at new firm creation, innovation, turnover and job growth.

The 2010 evaluation showed that 75% of the companies involved in the clusters predict innovation and new products as a result of their cluster membership, 60% got access to skills needed and 30% increased their sales during the economic recession thanks to being part of the cluster initiative. Cluster activities have proven to support firms in generating new and improved products and services, and also leading to enhanced sales. In the 2012 evaluation, 40% of firms agreed that cluster work has had an impact. The general trend is that work in organised clusters has led to improvements in other areas as well: increased employment, equality, workplace diversity and environmental sustainability. In some cases of successful clusters, employment has actually shrunk among member firms, but at the same time wages have risen, implying a transformation towards more productive jobs. Cluster firms are more resistant to business downturns than the general regional economy. Cluster firms have also taken hits but have rebounded more quickly than control groups (non-member firms in the same industries). Compared to clusters around the world, the clusters active in North Mid Sweden have a strong focus on innovation projects (as compared to commercial collaboration enhancing the efficiency of firms), including new technologies, products, processes and business models.

However, the 2012 evaluation indicates that there are still important innovation gaps in clusters. Clusters have been most successful in facilitating innovation co-operation between firms, both large and small. The most pervasive gap remains between firms and capital providers, a gap that further increased after the 2009 crisis. Results from cluster activities differ between the three regions. Member firms of clusters in one region experience much better results than member firms of clusters in the two other regions. As a consequence, there is scope for more intense learning across regions. The same is true for individual clusters. Some clusters outperform other clusters on almost all dimensions. There is thus a large potential for continued benchmarking and learning across clusters.

Source: www.regionvarmland.se/slim; Sölvell, Ö. and M. Williams (2013), *Clusters in North Mid Sweden: SLIM Evaluation Report 2013*, Region Värmland, Karlstad, Sweden.

In Hedmark, innovators are active in industrial packaging, energy systems, biotechnology, bioenergy and the food industry. There are also a few companies active in ICT applications (gamification for industrial processes, cyberdefence). The Arena Heidner cluster in blue-green biotechnology focuses on new breeding techniques to remove diseases and defects and develops new genomics-based selection tools for cattle, pigs and salmon. It is co-ordinated by the regional development agency Innovation Hedmark. The cluster operates in the framework of Arena, a national programme that aims to strengthen cluster innovative capacity by establishing stronger and more dynamic interactions between industry, R&D institutions and the public sector.

1.4. Functionality of the cross-border area

Due to distance and limited transport infrastructure between the economic centres, commuting and trade flows between the counties of Hedmark and Dalarna are negligible. In 2009, 7 persons commuted from Hedmark to Dalarna and 162 commuted in the other direction. Flows of goods between the two countries do not cross this border (Hedmark-Dalarna Border Committee, 2013). As distances between the main centres in the cross-border area are large and land connections are underdeveloped (there is no rail connection, limited bus supply and no motorways), cross-border commuting takes place by car, mostly between small bordering municipalities.

Hedmark is linked to the growing Oslo functional region, while Dalarna is comparatively farther from its country's capital, Stockholm. Thanks to improved rail and road connections in the north of Oslo, and to the relocation of the Oslo airport in the direction of Hedmark County (a one-hour train ride connects Hamar to the Oslo airport), commuter flows to and from Hedmark are directed towards Oslo. The strong expected growth in the Oslo region will provide more incentives for further expanding the Oslo functional region towards Hedmark County. Dalarna is linked to the Stockholm area, but geographic distance is more of a barrier. The two-hour drive from Börlange to Stockholm exceeds what is traditionally seen as a limit for a functional labour market area. It is not likely that Dalarna will benefit from the expansion of Stockholm in the near future.

Cross-border business co-operation tends to take place at the level of Inner Scandinavia or beyond, rather than between Hedmark and Dalarna. The Inner Scandinavia region includes several counties: Hedmark, Akershus and Østfold in Norway, and Dalarna and Värmland in Sweden (Figure 1.2). Many of the cross-border co-operation initiatives extend to this broader area. In the wood and wood processing industry, the Hedmark support company Tretorget developed co-operation with the neighbouring Norwegian county of Oppland and an Interreg project on bioenergy with the Swedish county of Värmland (where the cluster The Paper Province is located). Subsequently, the co-operation has been extended through the Interreg FEM project, covering Hedmark and Akerhus on the Norwegian side, and Värmland and Dalarna on the Swedish side (Box 1.3). The Swedish Triple Steelix cluster has a much larger footprint than the cross-border area. Neither Hedmark – nor Norway more broadly – play a particular role in the external linkages of this cluster. Similarly, the blue-green biotech cluster in Hedmark co-operates with knowledge actors internationally rather than with neighbours. The ICT cluster in Hedmark has a tradition of co-operation with the ICT cluster Compare in Värmland. Within the higher education sector, co-operation also takes place on a larger scale than Hedmark-Dalarna. The UNISKA (University Alliance in Inner Scandinavia) network used to group university colleges in Hedmark and Värmland (Karlstad) together with Norwegian colleges from other neighbouring counties. The University College of Dalarna joined the network later but is now an inactive partner. The fact that the main university on the Swedish side in Inner Scandinavia is in Värmland (Karlstad) explains that academic co-operation flows take place to a great extent with this university.

Box 1.3. **Complementarities in forestry and energy efficiency between Sweden and Norway**

In the forestry sector, there is a well-established value chain across the Swedish-Norwegian border. Business culture differences are less pronounced. Norway exports the bulk of its pulp production to companies in Värmland county in Sweden, and Swedish forestry companies export a large amount of timber and lumber to Norwegian wood industries. Machinery and equipment is often imported from Finland.

Since the Swedish forestry sector is larger, many competencies have been exported to Norway over the years. At a national level, there are assets for testing and research in both Sweden and in Norway (SP Trätek, the Swedish Institute for Wood Technology Research and its Norwegian counterpart Treteknisk, the Norwegian Institute for Wood Technology, along with SINTEF, the basic research institute in Norway, are active in the sector). The collaboration in this sector, however, has historically been stronger between Hedmark County in Norway and Värmland County in Sweden, rather than with Dalarna County.

There also seems to be potential for collaboration in the area of green growth, where Sweden and Norway have different, but complementary, competencies. Energy costs are higher in Sweden, and therefore the focus on energy efficiency has been stronger. A tradition of combining heat, pellets and other bio-energy sources has been developed and could also be used by Norwegian companies. To increase cross-border collaboration, Tretorget (the innovation development agency of the city of Hamar) has arranged study trips and the next board meeting of the Norwegian forestry cluster Tretorget will take place in Värmland, to meet with representatives of the Swedish pulp and paper cluster TPP (The Paper Province) and discuss possible benefits of collaboration.

The Norwegian forestry sector, through Tretorget, has been influenced by the developments in Sweden, gaining knowledge of energy, building material and smart energy systems in place on the other side of the border. A collaboration on smart grids for energy has been developed through the Interreg project FEM (Renewable Energy, Energy Efficiency and Environment), run in collaboration between Hedmark and Akershus (Oslo) in Norway, and Dalarna and Värmland in Sweden. This has resulted in contacts with researchers at the University College of Dalarna (in the field of thermal warmth) and the University of Karlstad in Värmland (with respect to small pellets machinery).

Source: Tretorget, interviews during the OECD mission, 22-24 April 2013.

There are no significant business interactions corresponding to the geography of the two counties. Many regional clusters do not operate cross-border. The main focus of the clusters supported in the Dalarna region, other than those mentioned above, is the region itself, and not the bordering areas. One potential exception is that of the construction industry, where the possibility of cross-border internships is under investigation but not yet implemented due to regulatory barriers. Dialogue exists between the Hedmark Tretorget organisation and the construction cluster on the Swedish side, Dalabit, but no concrete action has developed. According to regional business organisations, there are currently very few cross-border business exchanges between the two counties. Disincentives created by distance along with different currencies impede collaboration. The fact that wages are 30% higher in Norway may offer some cross-border employment opportunities for neighbouring Swedish workers; however, the wage differential is reported to be another collaboration barrier to innovation. Gaps in energy prices between the two countries also generate different motivations towards developing green growth potential.

Tourism is the only area where joint opportunities are clearly identified, and the footprint of this co-operation is a subset of the two counties along the international border. Both counties are lobbying together for construction of an airport to serve their joint ski destination and develop their summer holiday market. This co-operation does not cover the entire county on each side, as it focuses on the border municipalities. However, the two county tourism organisations have not yet developed strong linkages. The Hedmark does have an Interreg-funded co-operation project with Värmland in Sweden (Dalarna's neighbour to the south) focusing on joint marketing, while the Dalarna tourism cluster (Destination Dalarna) has a regional remit and does not include members from across the border. Green energy for ski resorts is a specific area where joint opportunities in winter tourism have been identified for Hedmark-Dalarna collaboration (Box 1.4).

Box 1.4. **The SITE and GREEN 2020 projects developing a joint "green" tourist destination between Hedmark and Dalarna**

The SITE project studies the potential and develops actions to promote a joint tourist destination at the mountainous international border between the counties of Hedmark and Dalarna. The project is funded by Interreg IV, the two regional authorities and the Norwegian government, and runs from 2011 to 2014. The project focuses on:

- **Winter tourism:** The main priority is the construction of an airport close to the bi-national skiing area. The aim is to expand the market to a more international clientele (today it serves mainly Swedish, Norwegian and, to a lesser extent, Danish visitors). The project also helps to develop associated services to accommodate the expected increase in tourists, such as: community services, infrastructure, a shopping mall and training.
- **Summer tourism:** The main target is to develop new tourism products and services that are competitive in the Scandinavian market. The key objective is to raise the competences of the small tourism operators and develop their capacity to promote their offer to a wider market. Activities include: 1) the identification of common needs among municipalities to improve/adapt the skills of the newly arrived immigrants as future tourism industry employees (notably in the food service sector); and 2) cultivating future entrepreneurs to contribute to year-round tourism.

GREEN 2020 is an Interreg IVA cross-border project between Norway and Sweden, running from 2011 to 2014. GREEN, *GRenseløst ENergisamarbeid*, means "Borderless Energy Collaboration" between ski resorts in Inner Scandinavia. The main objective of the project is to improve energy efficiency or use of renewable energy systems in ski resorts to reduce the environmental impact of winter sports activities.

To address climate change, the participating ski resorts are seeking responsible ways to reduce the environmental impact of their activities. Sustainable development of ski resorts not only contributes to cost reduction, but also creates a "GREENer" and more environmentally friendly image. The lead organisation for the Norwegian part of the project is the municipality of Trysil, home to Norway's biggest ski resort and project participant Trysilfjellet. The lead organisation for the Swedish part of the project is the County Administrative Board of Dalarna.

Source: Hedmark-Dalarna Border Committee (2013), "Cross-border regional innovation policies between Hedmark and Dalarna: Background Report for the OECD", January; interviews during the OECD mission 22-24 April 2013; www.green2020.info.

There are limited cultural barriers between the two counties, but business cultures do differ. Despite the fact that the two counties belong to different countries, norms and culture are very close, and the two languages are well understood on both sides. Some differences in business culture remain, however, as experienced by the business intermediaries in the two counties, partly attributable to the historical heritage and culture. Differences are also due, in part, to the fact that Norway does not belong to the EU, whose rules and regulations have an impact only on the Swedish side.

Hedmark-Dalarna cannot be considered a functional region from an innovation perspective; however, Inner Scandinavia is likely to offer more potential. There are benefits from economies of scale and scope to be reaped in the tourism industry. These benefits may accrue from developing joint branding and infrastructure (notably the proposed new airport), but such benefits do not depend on particularly innovative products or services. The other industries which have greater innovation potential (bioenergy, biotechnology, energy efficiency, etc.) are still small and their international connections are mostly outside of the cross-border area. The forestry and wood processing industries also have connections on a wider geographic scale. The reality of these connections indicate that other nearby partners elsewhere in Inner Scandinavia, including the booming Oslo region, have more functional innovation ties with actors in Hedmark and Dalarna than there are between the two. For the northern parts of both Hedmark and Dalarna that are further from these southern areas, there may be cases where relevant collaboration actors are found in other counties to the north.

CHAPTER 2

DRIVING FORCE AND KEY ACTORS FOR THE HEDMARK-DALARNA CROSS-BORDER AREA

2.1. Rationale for the establishment of the cross-border area

Table 2.1. **Snapshot of the rationale and relevance for cross-border collaboration**

(Hedmark-Dalarna in bold)

Driver	Explanation	Relevance for cross-border co-operation
Economies of scale	Combine resources for efficiency of investment, larger labour markets or access to wider business and knowledge networks to increase critical mass; often used to overcome peripherality	**Strong** Moderate Weak Not present
Political recognition	Increase the recognition and strengths of areas that are far from capitals to better negotiate and compete for resources from higher levels of government	Strong Moderate **Weak** Not present
Complementarities	Build on diversity of assets in terms of research, technology and economic base, as well as supply chain linkages	Strong Moderate **Weak** Not present
Branding	Increase internal recognition of the cross-border area as well as its external attractiveness to firms and skilled labour	Strong **Moderate** Weak Not present
Border issues	Address the day-to-day opportunities and challenges associated with flows of people, goods and services (including public services) across the border	Strong **Moderate** Weak Not present

Note: The assessment of relevance relates to the actual relevance in current cross-border collaboration, not necessarily to the potential relevance.

The cross-border activities focus on winter tourism and border issues. The launch of the cross-border area dates from the 2008-12 institutional TRUST project, an Interreg-funded project involving local authorities and focusing on institutional collaboration. Partners were the local authorities that subsequently formed the Border Committee (see Chapter 3), the two county councils and their administrative boards. The initial focus was the removal of border obstacles impeding the mobility of people and firms, which is particularly important to the tourism industry that requires accessing natural areas located on both sides of the border. For this reason, the co-operation only began with a few municipalities. The development of a joint ski tourism destination in the mountainous areas spanning across the border is the clearest binding factor in the committee's work. The list of projects decided by the committee reflects these priorities:

- **the tourism industry:** Airport planning in Sälen-Idre-Trysil; mountain package Hedmark-Dalarna; business development in national parks
- **reducing or removing border obstacles:** Cross-border public health and care; cross-border public transport

- **supporting activities:** Statistics Hedmark-Dalarna; visibility and profiling; geographic information systems

Other joint issues with potential mutual benefit are being explored. The two counties work together on demographic challenges (Sahlander, 2013). They seek to identify the roots and impacts of depopulation trends and work towards addressing them.

2.2. Role of key actors in cross-border area establishment and evolution

The impetus to develop a cross-border area is driven by local and regional authorities. As mentioned above, they identified the relevance of addressing border obstacles and economies of scale in tourism jointly.

Skistar, the large Swedish firm operating the ski resorts in the two counties, is the dominant firm in the sector. Its interest in better infrastructure for accessing the area (a new airport) is clear. The key expectation is to increase the number of tourists (both from domestic and international markets) to the joint resort of Trysil-Sälen. Hence, the firm plays a crucial role in joining the interests of the two communities across the border. However, the dominance of one operator leaves the region vulnerable.

Businesses and business support organisations play a limited role in the cross-border co-operation. Apart from Skistar, and some small tour operators, there is little record of companies developing cross-border linkages. Innovation Centre Hedmark and Teknikdalen in Dalarna are the two main innovation intermediaries on both sides of the border. They facilitate business networks and clusters and provide business coaching services, incubator services, idea scouting, support for accessing funding, international business guidance, matchmaking services between SMEs, etc. From their point of view, cross-border business interactions are limited and, while it would be worthwhile exploring the potential for some of these, the expected benefits remain so far unclear.[1]

***Ad hoc* academic collaboration exists on a wider geographic scale than Hedmark-Dalarna.** The UNISKA network, extending towards neighbouring counties, has developed six genuine cross-border study programmes at Bachelor and Master levels within subjects such as health services, music production, public administration and remote heating. The Hedmark University College has some successful co-operation with the University of Värmland (Master in Public Administration and Innovation Management). Dalarna University College is not an active partner in this network. Joint research in tourism takes place between this university college and the Eastern Research Institute in Hedmark. This type of collaboration is reported to be *ad hoc* and based on personal connections, rather than institutionalised.

2.3. Barriers for cross-border co-operation linked to actors

The two main innovation support organisations, respectively Innovation Centre Hedmark and Teknikdalen in Dalarna, have weak linkages. These two core business support organisations do not develop collaborative linkages due to a lack of demand from companies, and long physical distances between the economic centres of the two regions. There are possibilities for inter-regional learning, on methods and tools for support to SMEs in sparsely populated areas, or concerning sourcing for new technology developments of importance to the forest industries, but these are not developed in practice. Knowledge about actors and capacities present on either side of the border is also limited.

Table 2.2. **Key innovation actors in the cross-border area**

	Hedmark	Dalarna
Firms	Mining and manufacturing: Strand Unikorn AS, K A Rasmussen AS Construction: Eidsiva Anlegg AS	Mining and manufacturing: Outokumpu Stainless AB, Stora Enso Kvarnsveden AB, Stora Enso Fors AB, Ovako Bar AB Forestry and wood processing, paper: Stora Enso Skog AB, Stora Enso Timber AB, Arctic Paper Grycksbo AB Tourism: Ski Star AB
Public funding for innovation	Innovation Norway SIVA Regional Research Fund (with Oppland) Arena (clusters) VRI (regional research and innovation)	Tillväxtverket Vinnova (Vinnväxt programme)
Business services organisations	Clusters: Innlandsmat (food), Biolnn-Heidner (biotechnology), Tretorget (timber and construction/wood industry), Innovation Center and incubator Hedmark, NHO (Confederation of Norwegian Business and Industry, together with Oppland) Business advisors in the municipalities	Clusters: Triple Steelix, High Voltage Valley, Dala Sports Academy, Dalabit (construction), ITS Dalarna, Tension Graphic/Game Cubator, Destination Dalarna, Green Business Region, Boom Town Incubator/science park Teknikdalen ALMI Business Partner Industry organisations and chamber of commerce Municipal business support organisations Coompanion
Public research and tertiary education organisations	Hedmark University College Eastern Norway Research Institute	Dalarna University

Source: Hedmark-Dalarna Border Committee (2013), "Cross-border regional innovation policies between Hedmark and Dalarna: Background Report for the OECD", January.

The small size of operators in the tourism sector and competition in tourist promotion act as barriers for cross-border co-operation. The tourism sector in the two counties includes many very small companies that often do not possess the skills to develop and market internationally competitive products and services. This limited capacity is also an obstacle for firms to engage in cross-border co-operation, especially to develop a summer tourism offer. To some extent, regional and national actors are also competing on the tourism market, and the balance between co-operation and competition is not clear beyond the joint infrastructure (airport), where mutual interest is obvious. Also, the fact that Norway is outside of the EU is a disincentive for cross-border business co-operation, as Swedish companies have a preference for trading within the EU.

University colleges in the cross-border area co-operate more with universities than with each other. The goal of upgrading of research and education activities in university colleges is often better served with linkages to full universities, notably Karlstad University in Värmland, the county south of Dalarna. In practice, many joint initiatives in both education and research involve this university.

CHAPTER 3

GOVERNANCE OF THE HEDMARK-DALARNA CROSS-BORDER AREA

Table 3.1. **Snapshot of governance characteristics**

(Hedmark-Dalarna in bold)

Characteristic	Specification	Comments
National political capitals	Yes, each side Yes, at least one **None**	The cross-border region only contains small-sized cities, even in their national context, and rural areas.
Longevity of public co-operation (social proximity)	>20 years 10-20 years **<10 years**	Co-operation between the two counties is recent and focused on border municipalities. Some co-operation among border communities had been in place previously, dating back to 1995.
Innovation policy competencies (institutional proximity)	Balanced, strong **Balanced, weak** Unbalanced	The institutional set-up is similar in the two countries, as both counties have relatively limited competences in innovation policy and thus rely on national funding sources.
Political commitment (institutional proximity)	Balanced, strong **Balanced, weak** Unbalanced	Political support is weak beyond the joint interest in having an airport at the border and other practical cross-border issues.
Institutionalisation and legitimacy (institutional and social proximity)	Present, strong **Present, weak** Not present	The Border Committee provides a focal point for cross-border co-operation but it has a marginal role within the institutional set up of the respective counties.
Actors in governance	**Public sector** University/research actors Firms Mix of actors (triple helix)	The public sector commitment is not matched by strong bottom-up engagement of universities, firms or other actors.
Funding sources	**Mainly public** Mixed public/private Mainly private	Funding sources are mostly public, from the Nordic Council of Ministers and European Territorial Co-operation programme (in addition to national Norwegian co-funding).

3.1. Vision for the cross-border area

The Hedmark-Dalarna Border Committee has established generic priorities for its work. The vision is for "an innovative cross-border collaboration and partnership which reinforces the attractiveness and competitiveness and makes it easier to live, work and run a business in the region". The vision is translated into priorities, included in the Strategic Plan for Cross-Border Collaboration in Hedmark-Dalarna 2012-14:

- reduce or remove border obstacles

- focus on the municipalities closest to the border, develop a common labour market and experience area
- create an attractive region
- green growth and sustainable society

3.2. Institutionalisation and multi-level governance of cross-border co-operation

The Hedmark-Dalarna Border Committee, established in 2012, is in charge of co-ordinating the vision and action plan for cross-border co-operation. This new committee consists of regional authorities representing the two counties: the County Council of Hedmark, the County Governor of Hedmark, the County Administrative Board of Dalarna, Region Dalarna and a sub-regional authority, the Regional Council of South Osterdal (a grouping of five municipalities in Hedmark). The Secretariat implements the committee's decisions with its four employees in two offices: Hamar, Norway and Falun, Sweden. The emergence of this committee has been facilitated by an Interreg project (TRUST 2008-12) aiming at establishing the collaborative partnership between the regional authorities, extending it beyond collaboration between border municipalities.

There is no integrated action plan for co-operation between Hedmark and Dalarna. Four regional entities financially support the Border Committee: the Hedmark County Council, the Hedmark County Governor, Region Dalarna and the Dalarna County Governor.[2] However, neither of the two county business development departments have the remit or the resources to develop joint actions and policies in support of the vision endorsed by the Border Committee. The above-mentioned cross-border strategic plan is therefore not translated into the regional budgets and action plans.

Both Hedmark and Dalarna counties have limited institutional means to develop their own policies. Most policy instruments and budgets are the responsibility of the national level in both countries. So while the level of policy competencies at regional level are balanced on both sides of the border, they each require co-operation from national authorities. Both counties are in charge of designing regional development plans and in prioritising regional development funds, and, for Dalarna in Sweden, EU Structural Funds.

Hedmark and Dalarna strategic views on targeted specialisations overlap partly, and most clearly in tourism. Dalarna is developing an innovation strategy with a strong focus on clusters and the following priorities: smart material; smart energy solutions; and smart attractions for visitors. The Hedmark regional plan focuses on increasing the total population by means of the following pillars: infrastructure, business and knowledge development, energy and climate and attractivity. The focus of Innovation Norway (partly owned by regional authorities) in Hedmark is on: wood-based industries; food and agriculture; tourism; ICT; and biotech (breeding and genetics). In practice, the green energy and steel transformation specialisation on the Swedish side are not matched by the Norwegian side (the low cost of energy in Norway acts as a disincentive for the development of new energies). Tourism is the clearest domain with potential complementarities.

Hedmark-Dalarna co-operation does not appear in the regional development plans of either of the two counties. Strategic documents in both regions, the "Regional Plan Strategy for Hedmark 2012-2015" and the "Regional Development Programme for Dalarna Towards 2016", refer to the importance of internationalisation generally. Only Hedmark's plan mentions the specific cross-border dimension between the two counties; it is, however, as part of collaboration within the broader Inner Scandinavia area. In contrast, Värmland in Sweden has a "Norwegian strategy".

3.3. Funding for cross-border co-operation

Funding for the Border Committee comes from the regional owners and the Nordic Council of Ministers. Hedmark-Dalarna is one of (and the most recent) 12 cross-border committees officially recognised by the Nordic Council of Ministers. The committee's 2012-14 budget is EUR 1.1 million, half of which comes from the Nordic Council of Ministers, the other half comes from the regional partners.

Funding for projects is from public sources, essentially from European Territorial Co-operation (Interreg) and national/regional co-funding. The successive generations of Interreg A programmes have funded projects in the "Sweden-Norway" cross-border area. The Inner Scandinavia programme is the one that includes Hedmark-Dalarna: Interreg II (1995-99); Interreg III (2000-06); and currently Interreg IV (2007-13). The Swedish Interreg IVA Secretariat for Inner Scandinavia is located with the County Administrative Board of Värmland (Sweden). During the current period, SEK 73 million and an additional NOK 43 million have been allocated to the business development line in this programme. This funding source involves essentially public funding of regional origin (and national sources in Norway since the country is not part of the EU, therefore national funding is compulsory). No cases of 100% private sector funding for cross-border activities are recorded in the work of the Border Committee. An interesting case exists for one Interreg-funded project that has become at least partially self-supporting after the public funding period ended, although on a more limited scale: the UNISKA higher education network. In this case, Interreg played a facilitator role, and the organisations themselves found the value to continue on their own by seeking support from different local authorities and developing a self-supporting Master degree.

3.4. Barriers for cross-border co-operation linked to governance and funding issues

The national authorities have not integrated the cross-border dimension in their funding instruments. National and regional funding sources cannot cross borders. For example, cluster policies are the main regional development policy instrument in both counties, but they do not integrate a cross-border dimension. The Arena programme of Innovation Norway and Tillväxtverkert (Sweden) are two national programmes that fund innovation in regions. The respective programmes have a regional and national focus, but do not encourage projects which span functional regions crossing national borders. In the tourism sector, the national organisations Visit Norway and Visit Sweden may not be willing to support joint bi-national cross-border destination marketing given the competition of the two countries in this industry.

The cross-border partnership involves public authorities only. The Border Committee does not include representatives of the regional actors, companies, research and education organisations, business support and innovation support organisations. If the focus of action includes innovation support, the engagement of such stakeholders is important for ensuring the relevance of strategies and actions that ultimately need to be taken up by these actors. In order to involve private sector representatives in cross-border partnerships, one option is to include them directly in the governing bodies. An alternative is to create working groups or consultation processes that include different representatives of the "triple helix". This would allow dialogue between public and private sector representatives on cross-border issues and would avoid the development of an unbalanced "triple helix" governance for innovation policy collaboration.

CHAPTER 4

HEDMARK-DALARNA CROSS-BORDER INNOVATION POLICY MIX

4.1. Cross-border initiatives and policy instruments

There are no cross-border policies covering Hedmark-Dalarna, only a few projects funded by European Territorial Co-operation (Interreg) programmes. Apart from the above-mentioned project TRUST 2008-12, aimed at providing an exchange platform for regional authorities to define the goals of the cross-border partnership, the Hedmark-Dalarna co-operation is nurtured by temporary and publicly funded projects. These are forums and demonstration platforms in future-oriented domains such as green energy (FEM project), tourism (SITE), or at the intersection between the two sectors (GREEN 2020).

Bottom-up co-operation exists in the higher education sector. As mentioned above, some direct concrete collaboration takes place among higher education institutions rather than in broader university networks, but this is not the result of policies. It is the outcome of direct partnerships between individuals in the respective organisations.

Table 4.1. **Cross-border policy instruments in Hedmark-Dalarna**

Instruments	Programmes
Strategy and policy development	
Benchmarking and policy learning	TRUST
Analytical exercise (mapping of clusters or value chains, technology foresight exercises)	SITE
Joint branding of cross-border area	SITE
R&D support	
Joint public research programmes	
Joint research infrastructure, shared access to research facilities	
Cross-border private R&D funding programmes (generic and thematic)	
Technology transfer and innovation support	
Cross-border innovation advisory services (vouchers, intermediaries)	
Advisory to spin-off and knowledge-intensive start-ups	
Other technology transfer centres and extension programmes	
Science & technology parks and innovation networks	
Cross-border science, technology parks and incubators	
Cluster or network networks initiatives	FEM network on renewable energy, energy efficiency and environment and GREEN 2020 in energy savings for ski resorts
Human capital	
Scholarships/student exchanges	
Joint university or other higher education programmes	UNISKA university network (covering Inner Scandinavia), specific co-operation between University Colleges of Hedmark and Dalarna
Talent attraction, retention or mobility scheme; cross-border labour market assistance	
Other instruments	
Financing (venture capital funds or angel networks)	
Public procurement	
Other	

4.2. Untapped potential for promoting cross-border innovation synergies

Supporting the tourism sector through improved accessibility and economies of scale is a relevant goal, but it could be complemented by a distinctive "sports, health and green" offer. Given the important competitive pressure on tourism industries worldwide, it seems appropriate that the areas in Hedmark and Dalarna join their assets to develop an offer that is marketed internationally. Improving external accessibility is necessary in this respect and forward-looking cost-benefit studies, complemented by risk analyses, should inform stakeholders on the feasibility of building an international airport in the vicinity of the touristic area. This connectivity issue is not the only one to be solved. The marketing of a distinctive image, based on unique assets and innovative products and services, needs to be developed for the high-cost tourism sector to remain competitive. Local assets allow for a "sports, health and green" image. This would give several actors, notably the university colleges, the opportunity to participate in upgrading skills and innovation potential of the sector.

Limited cross-border co-operation opportunities seem to exist in other sectors, but they should be pursued if benefits outweigh costs. Actors from the construction and timber industry have mentioned some potential for co-operation. This could be explored in the context of the larger Inner Scandinavia area. Teknikdalen and Tretorget (respectively a Swedish entity focusing on SMEs and innovation and a Norwegian agency promoting innovation in the wood processing sector in Hedmark) could play a central role in this exploration, such as for joint use of specialised coaches. Further collaboration may be possible among the university colleges, in the area of lifelong and distance learning in particular, and again perhaps beyond the two counties. Common challenges and interests may be relevant for cross-border exchange and possibly joint innovative services between the two counties, such as for service delivery in sparsely populated areas (e.g. in the health sector), or goods and services for the needs of citizens in the periphery.

4.3. Relevance and effectiveness of the policy mix for cross-border co-operation

Table 4.2. **Snapshot of the innovation policy approach**

(Hedmark-Dalarna in bold)

Element of policy mix	Definition	Degree
Information	Mutual exchange of data, actor mappings and policy information	Strong Moderate **Weak** Not present
Experimentation	*Ad hoc* and temporary common initiatives without joint funding	Strong Moderate **Weak** Not present
Alignment	Mutual opening of programmes or structures across borders – no joint funding	Strong Moderate Weak **Not present**
Joint actions narrow	Limited cross-border measures, structures and actions with joint funding by actors from several regions	Strong Moderate **Weak** Not present
Joint actions broad	Multiple joint instruments co-funded by the constituting regions	Strong Moderate Weak **Not present**
Strategic policy mix	Joint common strategy adopted at the level of the cross-border area, translated into common policy mix co-funded by all constituting regions	Strong Moderate Weak **Not present**

There is no policy mix for cross-border innovation in Hedmark-Dalarna. Joint information and mapping of actors is now undertaken in the tourism sector through the SITE project, and was done to a certain extent through the university network UNISKA, extending to the whole Inner Scandinavia cross-border region. Those are the only areas where such cross-border information is exchanged on a relatively systematic basis. Further developments would involve the mobilisation of bottom-up actors to define relevant issues and means for cross-border collaboration.

CHAPTER 5

RECOMMENDATIONS FOR CROSS-BORDER INNOVATION IN HEDMARK-DALARNA

Hedmark and Dalarna share similar economic development challenges but do not have the internal resources to address them. Being relatively peripheral in their own national contexts, and dominated by traditional industries facing intense international competition, the two economies face the need to diversify into more knowledge-based activities and build critical mass around these. Some emerging activities are building on expertise developed in traditional industries. One example is blue-green biotechnology exploiting assets in farming and wood processing activities on the Norwegian side and new materials and ICT developments on the Swedish side. However, complementary assets are often found outside of the footprint of Hedmark and Dalarna counties. It therefore does not correspond to the natural area for co-operation in the majority of economic domains. Tourism, and possibly forestry-related industries, may have potential for economic development based on the current cross-border area.

5.1. Cross-border area

For innovation partners, consider surrounding Norwegian and Swedish counties of Inner Scandinavia, notably to the south

- **Tourism co-operation at the smaller scale of the border municipalities makes sense.** There is a joint natural area presenting a potential, already exploited for winter tourism, and to be exploited for summer tourism. By joining forces in external branding and infrastructure development, the two areas can reap mutually beneficial economies of scale.

- **Promote proximity innovation co-operation activities, outside of the tourism sector, with relevant partners beyond Hedmark-Dalarna, notably to the south.** Actual co-operation shows the limitation of the "two-counties" approach, when other domains of activities are considered than the border tourism industry. A relevant option is to extend the scope to the two counties to the south on each side (Akerhus and Värmland) which are more knowledge-intensive and provide enhanced opportunities for collaboration in innovation. They are also more physically accessible to the regional centres in both Hedmark and Dalarna. For some northern municipalities in both counties, relevant collaboration partners may also be found to the north.

5.2. Governance

Expand the governance frameworks to include non-public actors ("triple helix") for innovation co-operation, with project financing from existing national programmes

- **Associate private and knowledge actors in the cross-border governance in a broad sense.** To explore untapped potential in cross-border co-operation, it is important to involve firms, business intermediaries and actors from the research and education side, and develop initiatives based on a bottom-up demand for collaboration. This may take the form of advisory or consultation groups, for example.

- **Allow for cross-border funding in national programmes such as Vinnväxt (Vinnova, Sweden) or Arena (Innovation Norway), subject to demonstration of cross-border added value.** Proposals for initiatives that include a cross-border dimension, and demonstrate some

potential for additional benefits drawn from cross-border exploitation of complementary strengths, could be considered from national authorities on both sides. This could pave the way, together with experiences from other cross-border areas in the respective countries, to develop programmes and funding schemes including this cross-border dimension in other locations.

5.3. Innovation policies and instruments

Explore joint cross-border initiatives of mutual benefit and where benefits outweigh costs

- **Explore the relevance of joint activities of knowledge parks and innovation intermediaries (Innovation Centre Hedmark, Teknikdalen).** The first step in this direction relies on exchange of information on capacities and opportunities available in the neighbouring counties. On this basis, intermediaries are in a position to further stimulate joint activities at the appropriate scale. The focus should be on new combinations of innovative ideas and skills, which are made possible by the diversity in assets found in crossing the borders.

- **Explore joint activities in distance learning and joint education, particularly in tourism and forestry-related industries.** HEIs in the neighbouring counties should explore joint opportunities in developing a shared offer in the distance learning (an area where both Hedmark and Dalarna University Colleges have some distinctive assets) and life-long opportunities. Here too, the focus should be on capitalising on unique assets that the HEIs in the broader cross-border region possess.

NOTES

1. Per interviews during the OECD mission 22-24 April 2013.

2. These four institutions allocate an annual budget of NOK/SEK 500 000 (approximately EUR 60 000) per year to support the Border Committee. The Regional Board of Sør-Østerdal is a member of the Border Committee, but does not provide financial support.

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